Answers to the European Commission on the second wave of Calls for Advice in the framework of the Solvency II project

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**Style convention**

The following has been adopted for this document:

Advice appears in shaded (blue) boxes, headed **CEIOPS’ Advice**

*Extracts from the Calls for Advice appear in unshaded (white) boxes, with text in italics*

Descriptive headings are used (such as 'Background', 'Explanatory text' etc.) in an attempt to improve the navigability of the answers.
Introduction

1. The European Commission has requested CEIOPS to advise on the development of a new solvency system to be applied to life insurance undertakings, non-life insurance undertakings and reinsurance undertakings in the EU.

2. The design details of the future prudential system for the supervision of insurance undertakings are set out in the paper MARKT 2509/03. The paper lists the main features of the Solvency II project. The new system should:
   - assess overall solvency;
   - be based on a three-pillar structure, adapted to insurance;
   - build on a more risk-sensitive approach, with incentives for proper risk management;
   - increase harmonisation of quantitative and qualitative supervisory methods;
   - seek more efficient and effective supervision of insurance groups and financial conglomerates;
   - employ Lamfalussy or comitology techniques to adopt/adapt legislation efficiently;
   - ensure consistency between financial sectors; and
   - be developed in parallel with international developments\(^1\), and in particular be compatible with the estimated outcome of the international accounting (IASB) work.

3. The Commission has laid down its general conditions for consultation in the Amended Framework for Consultation of CEIOPS and other stakeholders on Solvency II.\(^2\)

Second wave of Calls for Advice

4. The specific Calls for Advice (CfA) in the second wave are listed and discussed in Annex 2 (sequel) to Framework for Consultation\(^3\). The Commission Services ask CEIOPS to advise on detailed rules concerning:
   - Technical provisions in life assurance (CfA 7);
   - Technical provisions in non-life insurance (CfA 8);

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\(^1\) E.g., the work of organisations like the International Association of Insurance Supervisors (IAIS), the International Actuarial Association (IAA) and the International Accounting Standards Board (IASB).


\(^3\) Available on CEIOPS website: [www.ceiops.org](http://www.ceiops.org).
• Safety measures (CfA 9);
• Solvency capital requirement: standard formula (life and non-life) (CfA 10);
• Solvency capital requirement: internal models (life and non-life) and their validation (CfA 11);
• Reinsurance (and other risk mitigation techniques) (CfA 12);
• Quantitative impact study and data related issues (CfA 13);
• Powers of the supervisory authorities (CfA 14);
• Solvency control levels (CfA 15);
• Fit and proper criteria (CfA 16);
• Peer reviews (CfA 17); and
• Group and cross-sectoral issues (CfA 18).

5. The Commission Services ask CEIOPS to incorporate in the answers, as far as possible, the criteria of the IAIS *Insurance Core Principles* and to make them operational.

6. CEIOPS is requested to transmit its advice on these issues by 31 October 2005. The third wave of Calls for Advice requests answers from CEIOPS by 28 February 2006.

7. CEIOPS has set out its answers in three parts. The first part outlines the specific questions raised in each CfA. The second part provides some additional explanatory information and context. It is intended to describe the rationale and facilitate understanding of the advice. The explanatory text (and the Framework for Answers) does not have the status of advice. The advice itself is marked in blue. This structure was also applied in *CEIOPS’ Answers in the first wave of Calls for Advice*⁴. CEIOPS notes that it is also broadly consistent with the approach adopted by CESR and CEBS.

8. CfAs 7 to 12 are related because they place requirements on insurance undertakings, whereas CfAs 14 to 17 concern requirements on supervisory authorities. CfA 13 deals with the planning of impact studies, while CfA 18 considers group and cross-sectoral issues.

9. CEIOPS uses the term 'insurance undertaking' to include direct insurance undertakings and reinsurance undertakings, both life and non-life. However, the specificities of different types of insurance business are reflected in the answers where appropriate.

10. The following section gives a framework for the answers to the second wave of Calls for Advice. This framework outlines a number of general principles applicable to the answers from CEIOPS.

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CEIOPS' Framework for Answers to the second wave of Calls for Advice

11. These answers should both enable the Commission to finalise its proposal for a Framework Directive and provide the basis for potential implementing measures at level 2. If the adopted Framework Directive foresees implementing measures, the Commission may give mandates to CEIOPS to assist in their drafting. In addition, CEIOPS will further develop level 3 standards and guidance. Level 3 standards and guidance will include descriptions of more detailed tools to be applied in Member States. The development and application of standards should take into account any particular characteristics of specific markets and classes of business. According to the Lamfalussy process, level 3 standards and guidance are not legally-binding – although national supervisors are expected to implement them on a voluntary basis. Level 3 convergence will be particularly significant for Pillar II.

12. CEIOPS notes that within CESR, the boundary between level 2 and 3 has been progressively clarified. CEIOPS will discuss the boundary extensively and hence may at a later stage amend its advice regarding at which of the two levels a specific issue should be dealt with.

13. In this respect, the dynamic nature of the boundary between level 2 and 3 should not be ignored. What might initially be a level 3 issue may, as the convergence of supervisory practices evolves, be transformed at the Commission's initiative into legally-binding European legislation.

14. CEIOPS uses the term 'regulation' to mean public law requirements imposed on insurers for regulatory purposes, e.g. the protection of policyholders, whether they are of a general nature or specific to the individual insurer, e.g. Pillar II additional solvency requirements. The term 'insurance supervision' is used to describe the ongoing process of monitoring that insurers comply with regulation, and the process of taking remedial action to secure the objectives of regulation. The ultimate action is withdrawal of the licence.

15. The future solvency framework in Europe will employ risk-sensitive regulatory requirements, where requirements depend on the risks assumed by undertakings. This may lead to a method of supervision where planning and execution of supervisory activities are influenced, among other factors, by an evaluation of the probabilities and/or impact of non-compliance with regulation.

16. Whereas a European solvency framework addresses remedial action (including supervisory intervention) as a consequence of non-compliance, this framework should not address sanctions whose

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5 Cf. CESR/04-527b to be found on the CESR website: www.cesr-eu.org.
sole purpose is to punish non-compliance. Hence, according to the principle of subsidiarity, such sanctions should not be subject to European legislation (although they may be a part of national legislation).

17. The answers do not elaborate on the objective of supervision. In Schedule 1: Solvency II – List of Work Areas and Timing for Calls of Advice, the Commission Services have indicated that "existing analysis of the objective of supervision is now sufficient for preparation of a draft Article in the Framework Directive".

18. In addition to appropriate inclusion in the Directive, supervision should, in level 2 regulation, include the exercise of sound judgement in identifying and evaluating risks of insurance undertakings, as well as the level and frequency of supervisory scrutiny. This will depend on the systemic importance, nature, scale and complexity of the activities of each insurance undertaking. Effective supervision requires that supervisory authorities should, based on regulation at the appropriate level, have in place adequate powers, legal protection and financial resources to exercise their functions and powers. They should also be operationally independent and accountable in the exercise of those functions and powers. In addition, they should hire, train and maintain staff with sufficiently high professional standards.

19. The Commission Services have indicated that the solvency system defined in a broader sense should take its starting point in a three-pillar structure inspired by Basel II: quantitative requirements (Pillar I), supervisory activities (Pillar II) and supervisory reporting and public disclosure (Pillar III). This implies that special considerations are made concerning the interaction between the different pillars of quantitative and qualitative supervision, as well as to the role of disclosure.

20. CEIOPS recognises that sound market conduct policies and procedures are a key part of the risk management of an insurer, and that the lack of good conduct may have an adverse impact on the risk profile of an insurance undertaking. This, in turn, may affect the solvency of the undertaking. However, these answers do not explicitly address conduct of business issues. This does not imply that supervisors in Member States will not include compliance with conduct of business regulation in their supervisory activities.

21. CEIOPS uses the term 'actuarial' to describe a function applying statistical-mathematical methods developed for use in insurance undertakings. It is not CEIOPS’ intention to specify the use of professional actuaries.

22. The answers to CfAs 7 to 17 apply to solo supervision. Although they may also be relevant to the supervision of groups, matters relating to supervision of groups and financial conglomerates are discussed in CfA 18.

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23. CEIOPS proposes that the Framework Directive takes into account the principle of proportionality of regulation. In developing Solvency II, CEIOPS notes that it is appropriate to introduce specific regulation after considering costs and benefits. Regulation should have regard to the nature, scale and complexity of the activities of the insurance undertaking concerned. This approach is particularly relevant to the regulation of small undertakings. In principle, the Framework Directive should provide the same level of protection to all policyholders. The treatment of small undertakings will be addressed further when CEIOPS answers the third wave of Calls for Advice.

24. CEIOPS notes that Solvency II should distinguish clearly between the role of supervisors, the role of the Board of Directors and the role of Senior Management of insurance undertakings. As a rule, supervisors should not interfere with management processes where regulation is being complied with consistently. Complying with Pillar I requirements does not exclude the possibility of additional requirements being set under Pillar II. However, to achieve a level playing field between insurance undertakings, it will be important to put as much as is reasonably practicable in Pillar I rather than Pillar II. This will depend on how susceptible risks are to quantification and the practicability of using standardised capital requirements.

25. In drafting its answers, CEIOPS has incorporated as far as possible the criteria of the IAIS Insurance Core Principles. However, in order to apply consistent terminology, some of the wording – but not the substance – has been revised. Similarly, CEIOPS has also taken note of a number of other reports on solvency issues.

26. CEIOPS has set out its general approach to transparency in its public statement of consultation practices. In line with this, these answers have benefited from valuable input from a number of stakeholders.

27. CEIOPS will need to consider the other CfAs and conduct full quantitative impact studies (QIS) in order to provide comprehensive analysis. These answers are therefore provisional and may be revised on the basis of further analysis on subsequent CfAs or the findings of impact studies.

28. At this stage, CEIOPS' advice consists of broad principles on potential implementing measures and, where appropriate, contains reference to the Framework Directive. CEIOPS will elaborate on these principles at a later stage.

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7 The terms 'Board of Directors' and 'Senior Management' are used in a functional rather than a legal interpretation, since the legal interpretation varies between Member States. See IAIS Insurance Core Principle No. 9.

8 As it is described in the Amended Framework for Consultation and the specific CfAs.
Extract from the Call for Advice:

The Commission Services would like CEIOPS to advice on the issues identified below and in Appendix I (tentative analysis of Article 20 of the Recast Life Directive 2002/83/EC). … The following aspects should be taken into account in the analysis.

Expected present value or “best estimate” provisions should be unambiguously defined in a way that is IASB compatible and takes international developments into account (in particular the work underway in the IAIS and the Groupe Consultatif/IAA).

To take into account the uncertainty of valuation, and to protect policyholders (…) risk margins must be set in addition to expected values. Relevant factors (…) and methods for establishing risk margings as well as the appropriate level of aggregation should be addressed. The methods should be, to the greatest extend possible, compatible with IASB developments and the solvency capital requirement (SCR) calculation methodology in order to minimize additional workload and costs for insurance companies. However, non-IFRS companies and SMEs require specific consideration, and actuarial rules should allow, where feasible, different approaches and approximations ranging from traditional deterministic methods to sophisticated stochastic modelling. After an appropriate technical structure for risk margins has been found, an analysis of the goals of provisioning from the point of view of solvency, supervision, accounting and feasibility, is needed. Finally, a proposal regarding the possible benchmark of level of prudence of the technical provisions with field-testing results should be communicated to the Services (see also request n° 13).

CEIOPS is requested to provide advice on how precisely to define the risk-free interest rate for discounting the estimated future cash-flows applicable both inside and outside the Euro zone. In addition, methods to establish technical provisions for the investment related parts of life-assurance contracts… should be developed. Ultimately valuation methods of profit sharing policies should be explicit and promote fairness and transparency to clients and other stakeholders. … CEIOPS should also address the new prudential aspects that arise when the guaranteed interest rate differs from the discount rate. Moreover, valuation techniques of mathematical finance should be investigated and their use encouraged particularly when assessing risks and prices of certain options in life assurance contracts …. Insurance contracts, including unit-linked contracts, as well as investment contracts should be studied. …

Finally, it is imperative to ensure that any changes in provisioning methods (…) do not lead to unfair sharing of profits or distortion of the distribution of bonuses. …
Explanatory text

Solvency II objectives

7.1 Valuation of an insurer’s technical liabilities with a view to achieving an increased level of harmonisation across the EU, together with more explicit definitions of margins for prudence, can be considered as one of the essential elements of Solvency II:

- all supervisory regimes currently recognise the necessity of a standard on technical provisions – in some cases, differing from the accounting standards
- harmonised technical provisions should increase the degree of harmonisation in consumer protection
- the proper valuation of technical provisions has a wider role within insurance undertakings. For example, it is essential for effective management of the underwriting policy or for asset-liability management
- supervisors use a range of supervisory tools to identify incorrect valuation or poor management decisions that may lead to failure. A standard on technical provisions has proven to be a suitable basis for taking action in a number of cases.9
- Under the Solvency II project, the Commission has therefore recognised10 the importance for insurance undertakings to establish prudent technical provisions.

7.2 It might be contemplated whether the need to develop an explicit standard on technical provisions could be avoided through using a ‘total capital requirement’ concept. This is where a total amount of funds required to support future liabilities of an insurance undertaking is calculated, comprising both technical liabilities and capital requirements. Under this approach, different levels of prudence in technical liabilities simply alter the split between capital requirements and technical liabilities – the total requirement remains the same.

7.3 However, CEIOPS notes that the perspective underlying technical liabilities and capital requirements is not necessarily the same. Whereas the valuation of technical provisions needs to consider the whole run-off period, capital requirements reflect a potential loss that an insurance undertaking may suffer during a set time horizon (e.g.

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9 See Report on prudential supervision of insurance undertakings (December 2002), under the chairmanship of Paul Sharma.

10 MARKT/2506/04 – Amended Framework for Consultation on Solvency II.
one year). Therefore, capital requirements and amounts in technical provisions are not fully interchangeable.

7.4 In its answer to CfA 10, CEIOPS takes the view that the solvency capital requirement (SCR) should limit the risk that the level of available capital deteriorates to an unacceptable level at any time during the specified time horizon. The unacceptable level of capital is defined as the point where assets no longer exceed technical provisions (valued with a prudential risk margin, and compatible with the principles laid out in CEIOPS’ answer to CfA’s 7 and 8) and other liabilities. This general concept ensures that the two main building blocks of the quantitative requirements under Solvency II - valuation of technical liabilities and determination of capital requirements – are part of a consistent overall framework. In a situation where a certain type of risk (e.g., reserve risk in non-life insurance) affects both the prudential risk margin in the provisions and the capital requirement, the quantification of the capital requirement would take into account the partial unwinding of the prudential risk margin over the specified time horizon, thus avoiding a potential ‘double counting’ of risks.

7.5 In setting an appropriate risk margin, CEIOPS recognises that there are a number of issues that need to be considered:

- any risk premium necessary to ensure the transferability of the liabilities to a third party
- addressing uncertainty in the valuation of the ‘best estimate’
- achieving an appropriate level of policyholder protection over the run-off period of the liabilities
- supporting harmonisation by setting a quantitative standard in an explicit manner

7.6 CEIOPS is exploring which level of confidence can be used to meet these considerations. Alternative formulations, such as a pure ‘market value margin approach’ might be difficult to apply in a consistent and transparent way, especially as different margins might be appropriate for different lines of business.

7.7 According to the IAA\(^ {11} \), standards should be internationally consistent, but they must recognize important national characteristics of the insurance industry. There are significant differences among Member States in product design and in claims experience as well as in financial markets, including the supply and quality of financial assets available for insurance undertaking investment. Valuation principles should be sufficiently broad to apply to different product structures.

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\(^ {11} \) IAA (2004) – A global framework for insurer solvency assessment.
Definition of insurance liability

7.8 The liabilities to be valued need to be defined. The term 'insurance liabilities' has been used throughout the document for technical provisions so that terminology is consistent with that of IASB. However, the concept will apply for Solvency II purposes to insurance policy related obligations, whether or not these are obligations under an 'insurance contract' as defined for IASB purposes\(^\text{12}\). The insurance liabilities should encompass provisions in respect of all cash-outflows that an insurer will incur in fulfilling its obligations towards policyholders and other beneficiaries. For example, this will include tax, expenses, or fees under service agreements. Allowance needs to be made for contractual bonus payments reflecting the manner in which they will in reality be determined. Where discretionary, non-contractual or constructive liabilities\(^\text{13}\) to policyholders exist, these should be provisioned realistically\(^\text{14}\).

7.9 Adequate allowance will also need to be included in an insurance undertaking’s balance sheet for all liabilities other than those failing to be provided for as part of the insurance liabilities.

Quantitative standard for technical provisions

7.10 Today the application of a common set of capital requirements will likely produce different views of insurer strength for each accounting system used because of the different ways accounting systems can define liability and asset values. In the view of the IAA\(^\text{15}\), these definitions may create a hidden surplus or deficit which must be appropriately recognized for the purpose of solvency assessment. It is vital for prudential supervision that the valuation methods used by undertakings are adequate to make an undertaking’s financial risk profile clear.

7.11 Technical provisions need to be determined on a basis compatible with IASB methodology, but not necessarily identical. IASB methodology may determine liabilities from a shareholder perspective and may thus explicitly allow for reductions in liabilities as an insurer’s creditworthiness declines. This is not appropriate in a regulatory framework which must consider the policyholder perspective. Regulatory valuation of insurance liabilities should not include any reduction to reflect the shareholder option to default on obligations. Whatever the solution adopted under IAS, it may be required to adjust the IASB provisions,


\(\text{13}\) Constructive liabilities include liabilities that result from an established pattern of past practice and that have created a valid expectation that they will be fulfilled in the future. They also include liabilities where policyholders may have been led to anticipate some form of benefit, for example by reference to communications made by the insurance undertaking, whether or not those communications were directly to policyholders.

\(\text{14}\) When statutory, non-contractual liabilities (statutory, non-contractual liabilities include an obligation to share profit which is provided for by the law, without necessarily giving individual policyholders a contractual enforceable right) to policyholders exist, these should as well be provisioned realistically.

\(\text{15}\) IAA (2004) – A global framework for insurer solvency assessment.
perhaps through an explicit additional liability shown in the regulatory returns, or through other means to achieve the same effect. Such an adjustment need not make regulatory technical provision incompatible with IASB methodology, as such.

7.12 Solvency II should aim at a methodology that will be transparent in the valuation of insurance liabilities. The resulting provision could cover both the expected present value of the liability cash flow, given insights at the time the insurance liabilities are being determined, and a risk margin. This risk margin should be set prudently, but not so prudently as to act as a disincentive for the private industry to underwrite insurance risk.

7.13 Further analysis is necessary to determine the extent to which methodologies for the regulatory valuation of technical liabilities should be prescribed by the supervisor. In any event, guidance (and requirements) on the type of methods which are acceptable to supervisors will be needed. Similar issues occur for the use of statistical methods in valuing non-life insurance liabilities. This is discussed further in paras. 8.11 – 8.15.

7.14 The expected present value could relate to individual contracts. But any risk margin may be applied at a higher level of aggregation (e.g., homogeneous risk groups). A single provisioning philosophy should underlie the methodologies adopted in practice for determining insurance liabilities for all policies, regardless of the nature (e.g. profit sharing, non-profit sharing, unit-linked), premium features (e.g. regular premium, single premium, reviewable premiums), contract conditions (e.g. guarantees, options, etc.) or contract duration.

7.15 Policy options and guarantees should be explicitly provisioned. This includes both financial options, guarantees embedded within the product and other forms. Options of the insurer (for example, the right to adapt premiums in some types of health insurance) should also be taken into account. Financial options and guarantees should be provisioned in a manner consistent with market-based values. However, values derived purely from financial theory may not properly reflect the full range of factors that can influence policyholders’ exercise rates, such as taxation environment or availability of insurance coverage. Others, such as lapse options, or the ability to convert the policy from a short term to a whole of life policy on pre-agreed terms (without evidence of continued good health) need to be provisioned on the basis of expected present values of cash flows and also considering a margin for risk. The present value of expected cash flows could be determined including allowance for best estimates of all relevant factors, e.g. historical and industry experience, the impact of anti-selection introduced by exercising options, or realistically-assessed profits on policy lapsation.

7.16 Some allowance could be made for more adverse levels of option take-up, higher or lower rates of discontinuance, etc. But it may be appropriate within the context of the SCR to disallow assumptions that a given policy may lapse if this would lead to a reduced insurance
liability. The precise treatment of option take-up rates within best estimate cash flows, insurance liabilities and the SCR will need further consideration.

Profits at inception

7.17 Valuing insurance liabilities by using the best estimate approach may lead to the recognition of profits or losses at inception of an insurance contract. On this issue, it is stated in the Basis for conclusions IFRS 4\textsuperscript{16} that:

"Assets and liabilities arising from insurance contracts should be measured at fair value. In the absence of market evidence to the contrary, the estimated value of an insurance liability shall not be less, but may be more, than the entity would charge to accept new contracts with identical contractual terms and remaining maturity from new policy holders. It follows that an insurer would not recognise a net gain at inception of an insurance contract, unless such market evidence is available."

7.18 For with-profit contracts and in a number of other cases, any surplus at inception might not be recognised as profit because of requirements in national law to distribute surplus to policyholders. In these cases, calculating the best estimate of guaranteed benefits may lead to a number of practical difficulties. A pragmatic approach might be to value the contract on a tariff basis at inception, although valuation post-inception would require further consideration.

7.19 Alternatively, any difference between the fair value of a policy and the valuation of a policy based on guaranteed benefits discounted using a risk-free interest rate could be interpreted as a technical provision corresponding to future or potential bonus, rather than as 'profit'.

Segmentation

7.20 Assessing the probability distributions of future cash flows requires a classification of underwriting risks into groups with similar characteristics, known as homogenous risk groups. This classification must be based in part on information from historical data on the liabilities portfolio, the undertaking’s specific circumstances and relevant data from the insurance industry.

7.21 Conceptually, the risk margin related to the quantitative level of prudence should be calculated at the level of the insurance undertaking as a whole. However, in practice, a valuation of liabilities will require a classification of underwriting risks into homogenous risk groups. CEIOPS would need to assess whether these homogenous risk groups might vary from national market to national market, according to criteria defined at EU level.

Discounting

7.22 The present value of the expected cash flows is equal to the value of an investment with identical cash flows to these expected cash flows which will be paid with certainty. Such an investment replicates the expected cash flows of the liabilities. A more efficient way to arrive at this present value is via discounting. An undertaking’s insurance liabilities cash flows might be discounted using a term structure of interest rates which has to be based on the effective yields on default-free capital market instruments.

7.23 A risk-free interest rate curve might be determined using the yield on the highest quality government bond issues available in the currency of denomination of the liability. Where the risk-free yield cannot be determined with sufficient confidence (for example because long duration bond issues are not available in a particular currency) then reference may be made to proxy measures, such as the swap curve. However, in such circumstances, there should be appropriate adjustments for the differences observed between government bond yields and the observed proxy yields.

7.24 It may even be more efficient if the nominal term structure of interest rates for the various currencies in the EU is prescribed (such as the Euro spot rate term structure). Various central banks already publish such term structures. This would allow insurers to value their liabilities using a prescribed term structure. Transparency is fostered by this method. If the capital market does not have the financial instruments available to replicate the longer term liabilities of insurers, prudent long term spot rates to arrive at a prudent extension to the market induced term structure of interest rates may be prescribed. Another option is not to impose the discount rate to be used but to set principles for this rate, notwithstanding the possibility for the supervisor to advise on a market-related rate for a given book of business. This approach is likely to be more flexible in taking into account capital market developments, but could have the effect that different insurance undertakings interpret the principles differently.

7.25 However, valuing technical provisions with a risk-free interest rate curve may not allow for 'sufficient prudence' technical provisions (as expressed in CfA 7). It might weaken the position of policyholders, if the provisions plus margins for risk do not reach the present level of provisions. An alternative may be that the supervisor prescribes or approves the term structure including a margin of prudence to calculate the insurance liabilities. But using margins in the discount rate for valuing liabilities may not be a satisfactory means of achieving an explicit level of prudence. For example, using a discount rate of 60% of the yield of a specified bond (an apparently explicit margin) in fact implies using varying implicit risk margins because the actual margin changes as interest rates change and is therefore not properly risk related.
Profit sharing

7.26 With-profits benefits (profit-sharing) can be conditional or unconditional. In this context, three types of liabilities are thus identified: liabilities that are enforceable contractual liabilities, discretionary or constructive liabilities, and liabilities globally provided for by law without normally giving individual enforceable rights to policyholders.

7.27 An example of an enforceable contractual obligation is an unconditional with-profits benefit where the amount of the benefit is linked only to an objective financial event so that the amount can be ascertained immediately. In modelling the cash flows, an undertaking must take account of the fact that the amount of the benefit depends directly for example, on corporate profits, investment yields or objective external returns. An example of such an option is the guarantee of minimum annual returns for with-profits insurance. Another example is the right to extend the contract on pre-agreed terms and/or rates. Such options may affect the cash flow from an obligation and thus have a value. (There are customary methods and techniques for the valuation of such unconditional with-profits liabilities, such as option valuation techniques.)

7.28 An example of a discretionary or constructive liability is a conditional with-profits benefit where the amount is determined wholly or partly by a decision of the Board. A conditional cash flow for insurers is the profit sharing that depends on a Board decision on allocating operating profit to policyholders. It is generally specified that there is profit sharing but the amount is not certain in advance; usually, of course, there is a link with actual investment results. But the relationship between these results, the profit sharing and the timing of the allocation, is not set out unambiguously.

7.29 The distribution of profits may also be required by law. An example of such a statutory or legal obligation is where law provides an obligation for the insurer to share with policyholders a determined percentage of its technical profits and a determined percentage of its financial profits. The obligation may not be contract-by-contract, but rather an aggregate one where the insurer has discretion to distribute the overall obligation between contracts.

Surrender value floor

7.30 Under present supervision legislation in the EU, there has been a minimum value for the provision to be maintained for insurance liabilities. The minimum insurance liabilities provision is any guaranteed surrender value of commitments in each contract. The insurer will need to select contract discontinuance assumptions when the entity is

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17 As an example, under the law of one Member State an insurer is compelled to share 90% of its yearly technical profits (mortality, costs...) and 85% of its yearly financial profits (yields). The global share may be immediately distributed to individual policyholders (e.g. as increases in benefits), or can be written in a “provision pour participation aux benefices” (provision for sharing benefits); it is nevertheless in such case irrevocably attributed to policyholders within a period of 8 years.
exposed to risk from the potential use of the option that the policyholder has to withdraw or persist, or to select the timing or the amount of such contract termination. Discontinuance can take the form of ceasing premium payments (this does not mean that the reporting entity’s liability has necessarily been removed) or terminating the contract. Discontinuance may give rise to the payment of the surrender value, to the granting of a paid-up policy, or to lapse without value.

7.31 Unless otherwise specified, 'surrender value' in the document also refers to transfer values which may be specified in non–surrenderable policies, when these policies give policyholders the option to transfer the contract from an insurer to another.

7.32 To determine the surrender value payable on withdrawal, the insurer usually would take the following into account:

- market assumptions assumed in the projection;
- any guaranteed surrender or transfer value scale; and
- constructive obligations incorporated within the contract.

Reinsurance

7.33 It is desirable to have valuation standards for gross provisions and net provisions. The articulation of these two requirements requires further analysis. When determining net liabilities\(^{18}\), an insurance undertaking should have regard to its gross liabilities, before reinsurance and other types of risk reduction. Appropriate allowance will need to be made for risk arising from insufficient reinsurance.

The management of technical provisions

7.34 Please see paras. 8.98 – 8.103 on the management of technical provisions, which applies to both life and non-life business.

CEIOPS’ Advice

Quantitative standard for technical provisions

7.35 CEIOPS recommends that the valuation of insurance liabilities should be based on the expected present value of cash flows (the mean of the underlying probability distribution, which CEIOPS terms “best estimate”), together with an explicit risk margin. This interpretation anticipates the outcome of the IFRS 4 project. It is clear that in case the project does not envisage an explicit risk margin, the excess in insurance liabilities over the best estimate will have to be shown

\(^{18}\) See also Draft Answer to CfA 8 for a discussion on insurance liabilities net and gross of reinsurance.
7.36 The expected cash flows should be based on actuarial assumptions (mortality rates, claims frequency, surrender rates, frequency of transfers of value, etc.) that are deemed to be realistic for the book of business in question. An undertaking must take into account expected demographic, legal, medical, technological, social or economic developments. This means for example, that a foreseeable trend in life expectancy must be reflected in the expected cash flows.

7.37 It is important to establish which factors influence the possible cash flows from insurance liabilities and the risks to receipt of cash flows due (e.g. reinsurance). An undertaking should be able to identify, quantify and substantiate these factors. Assumptions used in determining best estimate expected cash flows and the risk margin should be kept up to date to reflect any changes that have occurred in actual experience and which are expected to continue into the future.

7.38 Until IAS standards become available in this area, an approach to the inherent risks and uncertainties in insurance liabilities should be developed on the assumption that market-related data will be used where possible. This approach focuses on making the reports to the prudential supervisors adequate to a given extent. The required risk margin on the expected value is the difference between the expected value and the value needed to achieve a given level of confidence (of, e.g., 75%). This should ensure that the valuation of technical provisions is established allowing for an essential proportion of the unavoidable risks and uncertainties. CEIOPS will need to consider whether the given level of confidence should only be applied to insurance risks, or also to financial (non-insurance) risks for which capital market prices are readily available. The regulatory value of the technical provisions can be used to benchmark against the technical provision that has been reported using the accounting methodology.

7.39 The creditworthiness of an insurance undertaking should have no effect on the regulatory valuation of its liabilities.

7.40 In some cases, the probability distribution for insurance liabilities entered into could be very skewed. As a result of this skewing,
insurance liabilities set by reference to the given distribution percentile will not always be found to be adequate. Consequently, the risk margin on the expected value should not be less than a proportion of the standard deviation. The present value of expected cash flows is to be reported to the supervisor together with the insurance liabilities set using a proportion of the standard deviation criterion where it applies.\textsuperscript{19} This methodology might also be used for very small portfolios where it may not be possible to obtain a well-behaved probability distribution. The advantage of this approach is its uniformity.\textsuperscript{20}

7.41 Alternatively, some CEIOPS members suggest that uncertainty risks could be addressed by selecting a prudent discount rate for the valuation of liabilities.

**Profits at inception**

7.42 CEIOPS notes that valuing insurance liabilities by using the best estimate plus risk margin approach may lead to the recognition of profits or losses at inception of an insurance contract. IASB compatibility of this approach should be monitored as work on the insurance accounting project progresses. Other practical consequences also need to be considered – for example, the need that such margins should not be considered as profits in the profit and loss account, in view of the requirement in some Member States that in some profit sharing business, recognised profits must partly be distributed to policyholders. In some cases, provisions may be calculated following a tariff base.

**Segmentation**

7.43 For added transparency, determination of the insurance liabilities should be carried out using a policy-by-policy valuation of the present value of expected cash flows. The risk margin related to the quantitative level of prudence, calculated by homogenous risk group, should be added to the expected value of all these policies. However, the relevance of whole-entity calculations will also need to be considered. In particular, CEIOPS will consider further how diversification effects between homogenous risk groups could be taken into account where demonstrably based on sound actuarial techniques. This should be tested in QIS.

**Discounting**

7.44 Under a best estimate approach, insurance liabilities for life business should be discounted using an appropriate term structure of interest rates. Risk-free rates might be used for this purpose, with the potential consequences of any variability addressed in the SCR. However, some CEIOPS members consider that this uncertainty should be addressed through a prudent risk margin in the discount rate.

7.45 A nominal term structure of interest rates for each currency might be prescribed by the supervisor, or acceptable sources of such term
structures could be prescribed.

7.46 In some circumstances, a duration approach based on the full term structure might be an acceptable practical implementation of discounting. In such cases, the undertaking should first estimate the maturity characteristics of the underlying liabilities at the reporting date and determine an average maturity for every portfolio. It should obtain the interest rate appropriate to this maturity from the term structure of risk-free interest rates for that currency. The undertaking can estimate the current value of the insurance portfolio using this interest rate. The advantage of this is that this method is probably in line with the undertaking’s probable actual actuarial/administrative techniques.

7.47 In line with the observations made above, the insurer should estimate the impact which guaranteed interest rates could have on outgoing cash flows. These cash flows should be valued consistently with market values for similar guarantees or the related options.

Mortality assumptions

7.48 Insurance undertakings should compare their actual mortality experience against published mortality tables, and demonstrate that the risk margin included in technical liabilities takes adequate account of mortality risk, by reference to their recent actual experience. Insurance undertakings should also make reasonable provision for future expected increases in longevity in determining expected cash flows. Where determining insurance liabilities by reference to a given confidence level, appropriate allowance for adverse (positive or negative) developments in mortality experience would also be required (and more severe developments should be reflected within the SCR).

Investment-related parts

7.49 The nature of the underlying investments backing an insurance portfolio and the yields on those investments should have no impact on the valuation of those liabilities, except to the extent they affect the benefits payable to policyholders. The nature of the underlying investments backing an insurance portfolio and the yields on those investments would need to be reflected in the valuation of liabilities where:

- the contractual terms of the liabilities have a direct link with specific investments of the undertaking (e.g. in the case of unit-linked insurance where the undertaking does not bear the investment risk); or
- in the case of with-profit contracts subject to minimum benefits, where the terms of the insurance contract effectively create an option for the policyholder to benefit from upside whilst being protected from downside investment performance.
In practice, for unit-linked contracts without guarantees this would result in the chief determinant of the technical provision being the value of the underlying linked assets.

Profit sharing

7.50 Cash flows from insurance contracts are not limited to specific liabilities set out in the agreements or in law and under which one of the parties has a legally enforceable right at a given time to a benefit or benefits. There are also cash flows which can or do arise, without a legal obligation, on a decision of the undertaking’s Board. In such cases, the agreement generally includes a clause relating to the purpose of such payments and the undertaking’s discretion on them but it does not generally include a legally enforceable right. There are finally cash-flows which do arise from law, e.g. a minimal profit sharing provision, but without giving a given policyholder a legally enforceable right at a given time to a benefit or benefits. For insurers usually these are some type of profit sharing. With-profits benefits (profit-sharing) can be conditional, unconditional or dictated by law without enforceability from policyholders. In this context, three types of liabilities are thus identified: liabilities that are enforceable contractual liabilities, discretionary or constructive liabilities and liabilities provided for by law. Insurers may also have conditional premium payments: 'en bloc' clauses. Under an 'en bloc' clause, the Board has discretion to change premiums (or other contractual terms) unilaterally. Such cash flows in the form of discretionary benefits or premiums set by the undertaking are described here as 'conditional cash flows'. Where such clauses exist, appropriate allowance needs to be made for the likelihood of premium changes being capable of implementation in practice and the effects of adverse selection which typically results when premiums increase.

7.51 CEIOPS needs to analyse techniques for the valuation of conditional with-profit benefits. Consideration needs to be given to all factors influencing these cash flows, in particular to investment yields and the process of dissolving safety margins in the technical provisions for contractual benefits of policyholders in the course of time. In particular, CEIOPS notes that management actions can affect the size and timing of conditional cash flows and hence the availability of capital to cover losses. Moreover, CEIOPS needs to consider the implications of using risk-free interest rates for the valuation of conditional with-profit benefits where those benefits are dependent on returns on investments backing the insurance portfolio.

7.52 There might be future changes in the IFRS on the determination of profits for the purpose of determining the profits to be shared with policyholders. These standards still have to be decided. The possible impact on the level of insurance liabilities and on solvency capital required can only be determined when these standards are clear. Each insurer may then have to determine how it is affected, based on the terms and definitions in its insurance contracts and applicable domestic standards.
In general, insurance liabilities should be valued prospectively. Certain elements of the prospective expected cash flows may need to be determined having regard to retrospective features - for example, future surrender values. 

Discontinuance experience normally will have a significant effect on overall profitability to the insurer for many investment contract types. The insurer may use credible and relevant discontinuance experience to the extent practical. In the absence of reliable experience data for the class of risk under consideration (e.g., new products or later durations in the policy), other comparable sources would normally be considered. The experience based discontinuance assumptions used will need to be appropriate for the purpose for which they are being used. For example, different sets of assumptions may need to be applied depending on whether they are being used to determine the present value of expected cash flows, the risk margin in the insurance liabilities or the SCR.

It is important for each insurer to value the options of the policyholder to change the terms of the contract from the perspective of risk management.

A potential requirement supported by several CEIOPS’ members says that, at any time, the minimum insurance liabilities provision is to be at least equal to the sum of the guaranteed surrender values of the contracts (on a contract by contract basis). IAIS says the following on the subject: "some jurisdiction believe the valuation of insurance liabilities should cover the current surrender values of all insurance contracts, while other jurisdictions do not. But all the latter jurisdictions believe that total financial resources should be available to cover the current surrender values of all insurance contracts". Another solution expected to lead to lower insurance liabilities but which is more in line with realistic valuation of liabilities such as the best estimate approach, would be to extend the calculation of expected value to the policyholder option to discontinue the contract. This solution requires to some extent further attention by supervisors and actuaries in order to develop methods and practices for estimation of the value of such policyholder options. Where such an approach were taken to valuation of insurance liabilities, potential for adverse surrender experience due to changes from expected lapse rates would fail to be addressed by the SCR and the answer to CFA 10 refers to this.

The realistic valuation of assets and liabilities means that all possible
future cash flows will have to be identified and valued. Expenses that will have to be made in future to service an insurance contract are cash flows for which a provision should be calculated. The IAA observes that the insurer normally selects assumptions with respect to the future expenses associated with obligations arising from commitments the entity has made on, or prior to, the valuation date, including overheads.

| 7.58 | Usually all future administrative costs and consequential commissions should be considered. Where future deposits or premiums are factors in the determination of the liabilities, expenses related to the deposits or premiums should usually be taken into consideration. In addition, where appropriate, the expenses of administering investments normally would be taken into consideration, too. |
| 7.59 | The present value of contract loadings and the present value of expected expenses should both be recognised explicitly. Any difference stemming from an insufficiency or surplus of the present value of contract loadings to the present value of expected expenses would thus affect the valuation of the liability, without prejudice of what is advised in the above section on profits at inception. |

**The management of technical provisions**

| 7.60 | Please see paras. 8.117 – 8.136 on the management of technical provisions, which applies to both life and non-life business. |
Extract from the Call for Advice:

The Commission Services would like CEIOPS to advise on rules to value non-life technical provisions, with the aim of establishing technical provisions that are sufficient to cover the liabilities with a quantified level of confidence. ... To take into account the uncertainty of valuation and to protect policyholders (...), risk margins must be set in addition to the expected present value or “best estimate” provisions. The following aspects should be taken into account in the analysis.

- **required quantitative prudence level**: how should it be fixed, to what amounts exactly should it be applied;
- **actual quantitative prudence level**: how should it be evaluated, at what level of aggregation, etc.
- **obligation to use several appropriate actuarial methods amongst the generally accepted methods – some or all of these methods may have to be defined;**
- **if considered appropriate, criteria to decide on final amount of technical provisions when methods give differing results (...). These criteria must not be so strict that it prevents the exercise of actuarial judgement and discretion.**
- **introduction of a detailed annual report on the valuation of technical liabilities making explicit the actuarial and economic assumptions made, their evolution over time and the reasons for the benefits or losses of liquidation. ...**
- **appropriateness of introducing guidelines on reserving (levels of aggregation, allowance for risk interdependency, etc.).**
- **harmonization of data collected (...).**
- **adaption of the estimates of the technical provisions (... and mechanisms to ensure estimates of technical provisions are responsive to major external events (...).**
- **Treatment of non-IFRS companies and SMEs, avoiding undue complexity.**
- **To promote solvency on a long term basis, should a compulsory equalization mechanism be maintained regardless of the taxation and accounting regimes (...)?**

CEIOPS is invited to advise on how best to develop common EU actuarial standards to achieve greater consistency in provisioning practices. ...
Explanatory text

Solvency II objectives

8.1 The objectives set out in paras. 7.1 – 7.7 of CEIOPS’ answer to CfA 7 apply to both life and non-life technical provisions.

The Australian approach

8.2 On several occasions it has been stated that the standard on liability valuation for non-life insurance undertakings elaborated by the Australian Prudential Regulation Authority (APRA)\(^{25}\) could be applied as a suitable starting point for stipulating a quantitative prudence level for the technical provisions. Accordingly, a description of this standard seems useful here.

8.3 The basic concepts Outstanding Claims Liabilities and Premiums Liabilities are described as follows in the APRA standard:

"The Outstanding Claims Liabilities relate to all claims incurred prior to the calculation date, whether or not they have been reported to the insurer. ... The value of the Outstanding Claims Liabilities must include an amount in respect of the internal expenses that the insurer expects to incur in settling these claims."

"The Premiums Liabilities relate to future claim payments arising from future events insured under existing policies. ... The value of the Premiums Liabilities must include an amount in respect of the internal expenses that the insurer expects to incur in administering the policies and settling the relevant claims. The Premiums Liabilities are to be determined on a fully prospective basis..."

Both should be determined gross and net of reinsurance.

8.4 A quantitative requirement applies to these liabilities:

A "risk margin [over and above the central estimate] should be established on a basis that is intended to secure the insurance liabilities of the insurer at a given level of sufficiency – that level is 75 per cent."

[... This] risk margin should not be less than one half of the coefficient of variation for the insurance liabilities of the insurer."

This definition is worded in very general terms, which allows for a wide range of interpretations.

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Practicality of a quantitative standard

8.5 Although the current Directives\textsuperscript{26} establish a common concept of prudence, there is clearly a wide diversity in approaches to valuing technical provisions across the European Union. One of the objectives of a quantitative benchmark for prudence would be to harmonise these approaches.

8.6 The simplest way of introducing such a quantitative standard would be to define the desired outcome in quantitative terms and leave the precise method of calculation to the discretion of individual undertakings, subject to best practice and professional standards for treating homogenous risk groups. However, this may do little to correct the disparities in practice evident in the current system. In any case, technical difficulties to apply the quantitative standard should not be underestimated.

8.7 When statistical methods can be used, the evaluation of the best estimate and the risk margin depends on the type of method used. It is probably not desirable to impose a single calculation method: different methods may be more or less adapted to different situations. Moreover, it should be reminded that the Solvency II supervisory framework should encourage companies to properly measure and manage their risks. Therefore, regardless of the calculation mechanics, undertakings themselves should retain the ultimate responsibility for ensuring the adequacy of their provisions.

8.8 In a number of cases, statistical methods will not be relevant:

- the portfolio of claims may not be large enough (in respect of the volatility of claims);
- in most cases, large claims will have to be treated separately; and
- past statistical observation may be lacking.

In such cases, the insurer should nonetheless have some understanding of the risks that it is facing and therefore should be able to make a reasonable assessment of the risk margin needed for its liabilities, taking due account of external information as well as internal claims data.

8.9 It does not seem possible to list in a regulation the cases where statistical methods can be applied or not. The decision to apply or not to apply statistical methods for achieving the regulatory level of prudence in the provisions is part of the actuarial analysis required in the undertaking’s provisioning procedures.

8.10 In any event, guidance (and requirements) on the type of methods which are acceptable to supervisors will be needed. In particular, these should address small and medium size companies, which will not

\textsuperscript{26} Directive 92/49/EEC and Directive 91/674/EEC.
always have resources to develop sophisticated methods for evaluating their risk margin.

8.11 Against the European background, it will be necessary to develop common interpretation of what 'acceptable' statistical methods are.

8.12 If the Solvency II project provides the undertaking with very detailed formula for the capital requirements, introducing a quantitative standard on provisions only as a general principle could be seen as inconsistent. A minimum level of specification on the methods to be used could avoid this risk of inconsistency.

- A first approach would be to set a 'menu' of acceptable calculation methods to reflect different circumstances. In certain cases another calculation method might be used after approval of the supervisory authority. This option would permit greater harmonisation and could be considered as helpful for small and medium sized companies.

- In order to ease even more the stipulation of risk margins for small and medium sized insurance undertakings, another possible solution may be to stipulate some standardised values ('benchmarks') for the ratio of the risk margin to the best estimate\(^{27}\)\(^{28}\). These ratios may be fixed for the individual lines of business (possibly, by country). However, the results of statistical studies on the level of prudence in provisions for claims in the German and Portuguese markets\(^{29}\) suggest that it may be problematic to fix a single ratio for all undertakings.

8.13 The concern with these solutions is that they might stifle innovation and prevent companies from taking responsibility for assessing their own provisions. Also a focus on methodology might divert attention from the issue of data, which may be much more important. A preferable alternative would be to state some general rules and minimum requirements for actuarial methods to be considered appropriate, referring to advantages and disadvantages of well-established methods and their typical area of application. This would promote a common understanding of possible methodologies and ways of assessing them among supervisors and insurers. Auditors could check that appropriate methods have been used.

8.14 Under this approach, it might be useful to require the use of at least two statistical methods based on two different approaches. In addition, companies should explain their methodologies, including how they have

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\(^{27}\) That is the expected value of the liabilities.

\(^{28}\) The ratios suggested by the Australian studies (Trowbridge Consulting for the Institute of Actuaries of Australia (2001) – APRA risk margin analysis) were not explicitly for small companies but for those that, for any reason (namely lack of accurate data) could not do their own evaluation. If such benchmarks were to be fixed in Solvency II, CEIOPS should take into account the fact that those ratios should not represent average market values but should, in a way, "penalise" those undertakings – representing an incentive for improving the undertakings’ procedures – namely in gathering the necessary data).

\(^{29}\) Internal studies by Bundesanstalt für Finanzdienstleistungsaufsicht and Instituto de Seguros de Portugal, the results of which were made available to CEIOPS.
checked and cleaned up their data and dealt with data irregularities. When a methodology is considered inadequate by the supervisor, the latter should have the power to require the undertaking to use another approach.

8.15 These solutions are sketched out here for illustration purposes only. It is probably premature to try to fix the right balance between the level of harmonisation in methods and the necessary flexibility needed to ensure that the ultimate responsibility for the level of provisions remains with the insurer. However, the introduction of a quantitative standard on provisions, even expressed at a very general level, must provide for:

- cases for which statistical data will be inadequate or of doubtful applicability (although these cases cannot be identified ex ante in regulation);
- the need to supplement the general quantitative principle with minimum requirements for statistical techniques used by undertakings agreed at European level.

8.16 Given that no single calculation method will be appropriate to all circumstances, the supervisory review process related to the quantitative standard on provisions will have to take into account, as far as possible, the specificity of each undertaking. To ensure that the quantitative standard is fulfilled, the supervisor will, when appropriate, have to:

- review the quality of the data. This step will be key in the supervisory review process: bad quality data may increase significantly the estimation error of statistical methods;
- review the applicability and the relevance of statistical methods;
- examine other actuarial or technical justification (case-by-case estimation, etc);
- assess whether the level of prudence retained by the undertaking is in line with the quantitative standard.

When the results of this process lead the supervisor to conclude that technical provisions are insufficient, the supervisor should have the formal power to require that provisions be increased or/provisioning procedures be revised.

8.17 Checking the level of prudence is part of the supervisory review process related to provisioning procedures.

8.18 Although no mechanical supervisory method can be envisaged, early warning indicators on the level of prudence finally achieved should be

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30 By actuarial CEIOPS does not mean that the work necessarily has to be done by an actuary who belongs to any professional association of actuaries, just that the work has to be actuarial in nature and done by someone of suitable competence.
developed. They would help the supervisor in detecting the use of inappropriate calculation methods. Indicators should be simple tests, which could lie in the run-off observed during the preceding years or in the relative size of the risk margin in respect of the best estimate\textsuperscript{31}. They could be based on a common set of statistical methods agreed at European level.

8.19 All these considerations show the crucial importance of the data that companies should report to supervisors. Although, in some cases, supervisors will still need to rely on ad hoc information, for example collected during on site inspection, there is a need to strengthen and harmonise regular reporting for provisions. This will help to verify that the quantitative standard is properly and consistently implemented by undertakings across Europe.

8.20 Harmonisation of reporting tools is a complex task. Data requirements should be adapted to local circumstances and market practices. However, it is felt that significant progress could be achieved in this field with the definition of minimum common standards for run-off triangles.

8.21 In order to make a first assessment of the current reporting tools used by EU supervisors and of the improvements needed, CEIOPS conducted primary analysis using a questionnaire. The very first conclusion that can be drawn from the answers is that the reporting varies a lot from Member State to Member State and that in some cases, improvements would be welcome. Differences appear as well on the quantity of data collected as on the level of detail of those data (per class, line, and category/per occurrence year etc). Further work is needed to define some possible common minimum standards.

**Application of a quantitative standard**

8.22 Two alternatives can be considered regarding the application of the quantitative standard:

- a separate risk margin could be stipulated for the Premium Liabilities and the Outstanding Claims Liabilities, respectively;
- a common risk margin for the premium liabilities and the outstanding claims liabilities.

8.23 To stipulate the risk margins, the first alternative would necessitate a separate estimation of the distribution function related to 'incurred but not settled' (IBNS) claims and the risk margin related to 'covered but not incurred' (CBNI) claims.

\textsuperscript{31} These tests will have to take into account the size of the undertaking as well, as the results of existing studies suggest it. One example is the "APRA risk margin analysis" prepared by Towbridge Consulting for the Institute of Actuaries of Australia" to be found on website: \url{www.actuaries.asn.au/PublicSite/pdf/GITF06/pdf}. 

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With the second alternative, the procedure should be applied directly to the present value of all future claim payments relating to the total of CBNI claims and IBNS claims, to provide an overall risk margin. If it is decided in addition that the overall risk margin – for presentational purposes – should be shown separately for the premium liabilities and the outstanding claims liabilities, a suitable procedure should be established for allocating the overall risk margin between these liabilities.

It should be noticed that it is not a trivial task to establish (or estimate) a distribution function – or the relevant characteristics of the distribution function – for CBNI and IBNS claims. Establishing a distribution function for the total of the future claims payment could be still more difficult. In some cases though (where typically an underwriting year basis is used), the split between CNBI and IBNS claims is artificial and it is easier to model the two together rather than separately.

For practical reasons, it seems more appropriate to stipulate separate risk margins for the premium liabilities and the outstanding claims liabilities. However, an approach leading to one common risk margin for both liabilities may be accepted where a demonstrably sound statistical basis exists.

**Segmentation**

Three options should be considered:

- **individual claim estimation**: Determining the level of confidence for an individual claim will require considerable judgement. In most cases, aggregating the results of individual claims estimates will result in technical provisions with very prudent margins (diversification benefits will not be taken into account). Under this option, the articulation of the quantitative standard and the current case-by-case principle is, of course, straightforward.

- **line of business**: This might correspond to the most current actuarial practice. Even if the percentile was to be calculated on another level, separate reporting by line of business would be needed to facilitate transfers, etc. Under this option, the provisioning process is more likely to be integrated into the underwriting risk management of the undertaking. But not all diversification benefits will be taken into account (as it would not consider for example diversification between different lines of business).

- **whole entity**: Whole portfolio diversification benefits will be taken into account. However, the result of statistical methods applied to non-homogeneous categories of claims may be questioned. The risk of encouraging poor underwriting and provisioning procedures should also be highlighted.
8.28 A fourth option could be envisaged: the group level. However, given the role of technical provisions in the prudential framework (as a safety net to secure policyholder protection) – and the links with local contract law and winding-up regulation – it cannot be envisaged to stipulate a risk margin at group level. At this level, if necessary, diversification benefits will have to be recognised through a reduction of group capital requirements.

8.29 The application of the confidence level by line of business is the basis of the Australian approach. According to CEIOPS’ understanding, the APRA standard and guidance state that a risk margin should be stipulated separately for all individual lines of business. When adding the individual risk margins diversification effects may be taken into account. However, the standard and guidance are both rather general on this issue, and accordingly it seems to be left to the discretion of the insurance undertaking and its actuary to decide to what extent (‘where appropriate’) allowance for diversification should be given.

8.30 To assess the advantages and drawbacks of each option, several - and sometimes opposite - considerations must be made.

8.31 When an undertaking is in real difficulty, it might be desirable that portfolios and their claims provisions can be transferred to other undertakings with the regulatory risk margin. In such case, it would make sense that the regulatory prudence margin can be easily allocated to the transferred portfolio and does not depend on the size and nature of the receiving undertaking. To achieve this, the provisioning standard should be 'portfolio invariant'. The only practicable 'portfolio invariant' standard is the standard defined at the individual claim level. Nevertheless, even though a standard defined line by line is not portfolio invariant, it would have advantages over a whole entity approach: it would ensure that if each line could be transferred separately the accepting companies do not incur an immediate loss on the transfer.

8.32 The confidence level may be fixed for different segments of an undertaking (or a group) or even for each claim. When considering different 'segments', the sum of liabilities will include a larger margin than the margin that would have been required by the application of the confidence level on an aggregate basis. In this respect, the link with the SCR must be considered. The SCR will be defined at the whole entity level: this would suggest considering diversification benefits within the provisions at the entity level. Alternatively, these diversification benefits might be taken into account by adjusting the SCR requirement.

8.33 The use of statistical methods generally requires that the group of claims considered is the largest possible, but also as homogeneous as possible. However, defining a too large level of aggregation (without regard to the homogeneity of what is aggregated) may disconnect the requirement from usual actuarial practice and from sound risk management practice: it may encourage an undertaking to compensate different lines of business, without analysing rigorously the quality of
its provisioning practices and the volatility of its provisions – which differ according to different business lines.

8.34 All things considered, a line of business calculation seems to be a necessary starting point. The possibility of allowing for diversification effects might be considered if reliable and testable methods were available, but this option needs further analysis.

8.35 In order to improve harmonisation across the European Market, the lines of business should be defined by a list at the directive level. The segmentation used for the calculation of the technical provisions should define homogeneous lines of business and should be consistent with the segmentation used for SCR underwriting risk.

8.36 The list should be based with strong continuity on the existing subdivisions. EU reporting classes from the Accounting Directive could be used as a starting point. In practice, aggregating data at the level of the line of business, as defined in the current Directive, may not always be adequate. The need to define sub-lines of business, which might depend on national features, should be considered when elaborating the European quantitative standard. One option would be to define principles that companies should apply for subdividing the list.

Reinsurance

8.37 The quantitative standard can be envisaged for provisions gross or net of reinsurance.

- **net provisions**: Providing that the level of reinsurance is adequate, statistical methods should in general be more easy to apply to provisions net of reinsurance (and more relevant). However, this may not always be the case: for example, a significant change in the reinsurance programme might be an obstacle to the application of common actuarial techniques. Net provisions need to be considered because they represent economic exposure.

- **gross provisions**: Reinsurance does not exempt the direct insurer from its commitments towards policyholders. The insurer still faces a risk of counterparty on the amount of ceded provisions. To have a global view of the risks linked to reserving, it is necessary to consider gross provisions. For those reasons, harmonisation should also be sought at gross level. However, in practice, a more significant part of gross provisions might fall out of the scope of application of statistical methods.

8.38 The APRA standard does not clearly opt for one of the two alternatives\(^\text{32}\):

In principle, "the risk margin should normally be determined having regard to the uncertainty of the net insurance liabilities, but consideration should also be given to any additional uncertainty related to the estimate of reinsurance recoveries."

"In practice, the estimation of the value of the insurance liabilities may be either undertaken on a gross basis, with a separate estimate of the value of reinsurance recoveries, or on a net basis."

Therefore, it could be envisaged to define separate quantitative standards for gross and net provisions. Except for proportional reinsurance, there is no reason why the two standards should always coincide, even if the confidence level is the same for both standards. But the articulation of a requirement on gross provisions and a requirement on net provisions allowing for a consistent evaluation of reinsurance recoveries, is not an easy task and requires further analysis. This difficulty is due to the fact that the VaR measure is not sub-additive. In this respect, the concept of TailVaR could be considered to build a consistent link between gross and net provisions and reinsurance recoveries.

8.39 There are cases where gross provisions at a given percentile will automatically result in net provisions above the same percentile of the net claims distribution. There may also be (less frequent) cases where net provisions at a given percentile will only be possible if gross provisions are above the same percentile. Therefore, it seems illusory to define the quantitative standard on provision as a 'precise percentile'. It would be more relevant to define this requirement as a minimum (e.g., "at least the 75th / 90th percentile" for both gross and net provisions). This might simplify the articulation of a requirement on gross provisions and a requirement on net provisions.

8.40 The level of confidence defined for gross and net provisions does not necessarily have to be the same. On the contrary, a higher confidence level for net provisions could be an incentive for companies to get proper reinsurance cover.

Treatment of future cash flows

8.41 A specificity in non-life insurance is that the main uncertainty lies in the amount of claims. Actually, non-life insurance largely covers short-tail business. In addition, even in the case of long-tail claims, the final amount remains the major source of uncertainty, because the randomness of the final amount increases with the time horizon - due to inflation, juridical risks, etc. Thus the additional complexity arising from discounting (and the difficulty in setting a realistic rate) could simply increase modelling error, rather than improving the realism of the solvency framework.

See CfA 12 for further developments on this 'link'.

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33 See CfA 12 for further developments on this 'link'.
Discounting of non-life technical provisions is not widely practised at the moment. Although the Directives\textsuperscript{34} permit discounting under certain circumstances, few Member States tolerate this option, and even in these States, few insurance companies make use of this possibility (see the Manghetti report\textsuperscript{35} for illustration).

However, in order to better reflect economic reality, the timing of future cash flows would need to be taken into account, resulting in the use of discounted provisions.

Clearly, taking discounting effects into account more explicitly cannot be envisaged without taking into account more precisely the converse effects of inflation risks on claims and expenses. In particular, for long-tail claims, inflation and its uncertainty is one of the major risks. It is important that this risk be properly considered. Inflation can have different effects on different lines of business. For some lines of business the rate of claims inflation (including all factors that act to increase claim amounts) can exceed the interest rate, and it would not be uncommon for discounted provisions (that make full allowance for inflation) to exceed undiscounted provisions, if the undiscounted provisions do not take inflation into account.

Although the current European regulation obliges insurers to take into account inflation in their estimation of ultimate cost, one of the main benefits of discounting might be to force insurers to consider claims inflation more explicitly. This would suggest the need for a requirement on how to consider inflation explicitly.

Discounting would also be more consistent with assets marked-to-market. However, further analysis is required to assess how to take into account the full range of ALM issues for a non-life insurer.

It should also be noted that the ongoing IASB insurance project may result in the discounting of insurance liabilities under financial reporting. However, the standards set by the IASB may be difficult to apply to prudential reporting. The problem of compatibility between financial and prudential reporting needs to be considered. Anyway, being compatible does not mean that the same rules have to apply. For example, it could prove easier to link the provisions discounted following the future IASB rules with undiscounted technical provisions than with technical provisions discounted following a very different methodology.

\textsuperscript{34} See Article 60(19)(g) of Directive 91/674/EEC.

Three alternatives can be considered:

- absence of discounting, i.e. remaining with the actual standards;
- using a deterministic approach to discounting (with a duration or a term-structure approach);
- developing stochastic discounting techniques.

These options bring in different implications.

The main argument against the first alternative is the need for consistency between the valuation of assets and liabilities. However, it should be noted that discounting is an appropriate operation if flows are certain as to their timing and amount, although any uncertainty about the present value of claims should be reflected in the risk margin in provisions. Furthermore the adoption of discounting techniques may delay supervisory action as, in comparison to insurers with the same equity, and in the case of a financially inadequate management, deficits in the margin emerge slowly (and even more sluggish in the case of slow claims paying insurers).

A deterministic approach could lead to problems associated with choosing a particular discount rate: from a practical viewpoint the subjective elements on the measurement of future cash flows would need to include assumptions (implicit or explicit) on the timing of payments and the rates of interest to be used. For example, with a duration approach, selecting a risk-free rate would require the isolation of premiums for credit and liquidity risk. Conversely, one of the main alternatives – using a replicating portfolio assumption to derive the discount rate – would be relevant only at a discrete point in time.

However, the difficulties of the deterministic approach should not be overestimated. In most countries Government bonds can be regarded as risk-free and their yield can be used to derive a suitable yield curve. To address the fact that the uncertainty of the final amount tends to increase with the time horizon, an explicit margin in the discount rate (forming part of the margin in provisions) might be envisaged.

Stochastic techniques to discounting could offer greater realism. This may be useful where yield curves are subject to frequent change. However, it would involve important practical difficulties, which may be of particular concern for less complex undertakings.

Another issue arising from discounting is that the recognition of discounting effects could have a negative impact on the harmonisation of technical provisions, if the discount rate reflects only the home state of the insurance undertaking. Different economic conditions prevail in individual Member States, and should influence the level of technical provisions. To ensure a level playing field, the calculation of technical provisions – including the relevant discount rate – should reflect the location and the currency of the liability.
The solution developed for technical provisions will have to be consistent with the approach to risks underlying the solvency capital requirements.

If technical provisions are not discounted, a corrective factor could be introduced in the SCR as is the case in the National Association of Insurance Commissioners’ Risk Based Capital (RBC) formula. The practical implications of such an adjustment would require further consideration.

Alternatively, if provisions are discounted – and explicit allowance for inflation is made in technical provisions – the SCR formula will have to capture more accurately the risks of changes in interest rates and in inflation. Complex elements will have to be considered for the link between interest rates and claims inflation in different lines is not evident to capture.

Also, discounting should be discussed in terms of transparency:

- Should the method, assumptions of discount be shown in the notes to the accounts?
- Should the reduction in the claims outstanding provisions caused by discounting be shown in the accounts?

**Provision for claims outstanding**

The Third Non-Life Directive\(^{36}\) (Article 17) amending Article 15 of Directive 73/239/EEC sets that "The home Member State shall require every assurance undertaking to establish adequate technical provisions in respect of its entire business. The amount of such technical provisions shall be determined in accordance with the rules laid down in Directive 91/674/EEC."

Article 28 of the Accounting Directive\(^{37}\) defines the provision for claims outstanding as "the total estimated ultimate cost to an insurance undertaking of settling all claims arising from events which have occurred up to the end of the financial year, whether reported or not, less amounts already paid in respect of such claims". In line with this definition, Article 60 of the Accounting Directive states the principle of case-by-case estimation of notified claims completed by an evaluation of IBNR.

The Manghetti report showed that the current definition of outstanding claims, based on the case-by-case estimation, has led to a common understanding of provisions for claims in Europe. Furthermore, as the KPMG report\(^{38}\) explains it, case-by-case estimation is in practice an

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\(^{36}\) Directive 92/49/EEC – On the coordination of laws, regulations and administrative provisions relating to direct insurance and other than life assurance and amending Directives 73/239/EEC and 88/357/EEC.

\(^{37}\) Directive 91/674/EEC – Annual and consolidated accounts of insurance undertakings.

\(^{38}\) KPMG for the European Commission (2002) – *Study into the methodologies to assess the overall financial position of an insurance undertaking from the perspective of prudential supervision.*
essential part of the process of establishing claims provisions. As such, it can be considered as a potential foundation of most provisioning procedures principles, under Pillar II.

8.61 Case-by-case estimation is also closely linked to the nature of contracts and local law: in some cases, local law may impose the minimum amount to be reserved. It should also be added that, in some Member States, this way of envisaging provisions is also the basis for winding-up regulations, granting exclusive access to a subset of assets meeting technical provisions.

8.62 The case-by-case principle, which is a necessary reference for a prudential framework, should actually not be envisaged as in contradiction with statistical methods. On the contrary, as Article 60 of the Accounting Directive shows it:

- a complement to the case-by-case estimation (for IBNR) is necessary: this complement is generally evaluated by statistical methods; and

- derogation to the case-by-case estimation is already provided for by the Directive, "having regard to the nature of risks".

8.63 With the introduction of the new prudential system, case-by-case estimation will be necessary:

- The use of statistical methods will not be relevant in all cases. In such cases, considerable judgement will be needed to determine the required prudence level, and the undertaking will need to perform case-by-case estimation to justify its actuarial approach.

- Even when statistical methods can be used, they may have to rely on some case-by-case estimation rather than only past observations. In fact, case-by-case estimation can integrate more information or 'updated information', in comparison to past data on paid claims.

- Case-by-case estimation is a foundation of sound underwriting risk management. It is one of the 'feedback mechanisms' identified by the Sharma Report "to adjust pricing based on experience and to amend technical provisions to reflect issues identified".

8.64 In any event, the insurer should understand, and be able to explain to the supervisor, differences between case-by-case estimates and the provisions it establishes. If the two methods are in conflict, either the statistical method or the case-by-case estimation may not be adequate. However, the statistical method may result in a lower

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39  For example, by taking into account the results of changes in law or case law.

estimate since it may take diversification effects between individual contracts into account, which is out of scope of the case-by-case estimation. The undertaking is responsible for using appropriate and reliable techniques to value its provisions. This should be reviewed as part of the SRP.

8.65 Therefore, the most natural way of introducing the quantitative benchmark would be to define it as a principle supplementing the case-by-case principle.

8.66 Another question is whether the case-by-case estimation should serve as a floor to the statistical evaluation of the undertaking. This approach could allow for a more robust evaluation of the provisions, but may not reflect diversification effects. It could be argued that it would not help in harmonising the level of prudence across the European Market: the harmonisation of the prudence of the estimations could be questioned regarding its dependence on specific internal management guidance (which can vary from country to country, from undertaking to undertaking, and – regarding the same undertaking – from one year to another year). However, the issue of achieving harmonisation applies to the statistical method as well: diversity in statistical method can be as high as with case estimation, and in some cases these statistical methods use information derived from case-by-case estimation. The harmonisation across the European Market will need to be considered under Pillar II.

8.67 An alternative approach would be to accept that the valuation of technical provisions under a supervisory solvency assessment may differ from the valuation under statutory accounting rules. Such an approach is suggested by recent work of the IAIS.\[41\] Within the context discussed, CEIOPS may implement this idea as follows:

- for statutory accounting, CEIOPS upholds the case-by-case estimation principle, and supplements it by a statistical evaluation according to a given quantitative benchmark. The case-by-case estimation should, in this context, serve as a floor to the statistical evaluation. However, where the individual estimates include margins, the overall margin resulting from aggregation of case-by-case estimates should not be excessive;

- under a solvency assessment, CEIOPS allows the application of statistical methods to value technical liabilities according to the benchmark principle, accepting that in some cases this will mean that, due to diversification effects, the sum of the case-by-case estimates will have to be adjusted.

8.68 Further analysis is required to consider the relationship between the case-by-case estimation and the statistical estimation. No definite choice can be made before having an idea of the number of cases where the aggregation of case-by-case estimates is higher than the

\[41\] IAIS (2005) - Towards a common structure and common standards for the assessment of insurer solvency, draft consultation paper, version 05 October 2005.
statistical estimate (with a level of prudence of, for example, 75% or 90%). Furthermore, in those cases, it will be necessary to make an analysis to assess why the two methods differ.

Current level of prudence

8.69 In order to make a first assessment of the actual quantitative prudence level in technical provisions a primary analysis was made regarding two Member States – Germany and Portugal. The process to make this evaluation involves nevertheless several methodological difficulties. This analysis should be considered as a first approach to this evaluation and the conclusions should, consequently, be considered with the necessary prudence.

8.70 Considering the view expressed in the CfA and the Solvency II developments in this field, the studies calculated, for each undertaking:

- a best estimate for provisions; and
- a risk margin with respect to a confidence level of 75%.

The assessment of the actual level of prudence was then performed, for each insurance undertaking, comparing the estimate provision (best estimate + risk margin) with the provision established by the undertaking (balance sheet amount).

8.71 The German and the Portuguese study reveal different level of prudence:

- In the German study (49 companies considered, 81% market share in premiums), in 96% of the cases, the statutory provision exceeds the estimated provisions with a risk margin of 75% (respectively 78% of the cases with a risk margin of 90%).
- In the Portuguese study (12 companies considered), the statutory provision exceeds the estimated provision for one undertaking only with a risk margin of 75%.

8.72 However, the results of the studies have to be viewed with caution - their explanatory power seems to be limited especially because of their scope of application:

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42 The German and the Portuguese studies both used the same base methodology but differ with regard to some smaller technical points (for example, the exact choice of the tail factor). However, it seems probable that these minor technical differences have no material effect on the results, so that the findings of the two studies may still be compared.

43 Using 'basic' Chain Ladder method applied to the triangle of paid claims (very popular method: simple, distribution-free and working with almost no assumptions, but sensitive to variations in the data observed). In the German study, also the additive method was used.

44 For the calculation of the 'risk margin', the Thomas Mack model was used. This model is a stochastic approach of both the additive and the Chain Ladder method, giving the same estimates as these methods, while also allowing the calculation of the variability associated with those estimates. Under some assumptions on the distribution, it is then possible to derive the risk margin from the standard error.
• The studies were reduced to a limited number of companies. The more volatile results were excluded.

• Only motor liability insurance was considered, which is a stable market with small risk margins. Other lines of business could have produced a different picture.

8.73 To corroborate the results of the studies, it would be useful to apply other actuarial reserving methods. There is a whole range of methods (each of which allowing for a range of variations), which will typically lead to a range of estimates for both the best estimate, and the risk margin. To this point, a French study reveals the great sensitivity of the results to the method chosen.

8.74 The great dependency of the results on the data used and its accuracy should also be mentioned, whatever the methodology used may be. This must be one of the main concerns to be taken into account.

8.75 Anyway, the above-mentioned studies indicate that, in some Member States, the 75th percentile might be lower than the current level of prudence. Therefore it would be useful to test a range of levels in the QIS. CEIOPS recommends testing the 75th and 90th percentile. Other levels of prudence, higher or lower, might be tested in a second stage. However, the compatibility of lower percentile than the 75th with the need for prudence in the technical provisions is highly questionable. The tested levels of prudence should be compared with estimates of the current level of prudence. As part of this testing, the size of the risk margin relative to the expected present value should be considered.

**Premium provisions**

8.76 As for premium provisions, the Accounting Directive provides for two components:

• the provision for unearned premiums, which "shall comprise the amount representing that part of gross premiums written which is to be allocated to the following financial year or to subsequent financial years";

• the provision for unexpired risks, "i.e. the amount set aside in addition to unearned premiums in respect of risks to be borne by the insurance undertaking after the end of the financial year, in order to provide for all claims and expenses in connection with insurance contracts in force in excess of the related unearned premiums and any premiums receivable on those contracts."

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45 Internal study by the Commission de contrôle des assurances, des mutuelles et des institutions de prévoyance, the results of which were made available to CEIOPS. This study aims at quantifying the current level of prudence of the provisions in the French market, by line of business, and using several different methods. It considers all data from the French market aggregated into one undertaking. Therefore it is not directly comparable to the two other studies. Example: motor insurance civil liability. With a Thomas Mack method, the actual margin of prudence is estimated at 20% of the central estimate with a standard error of approximately 1%. With a Stanard-Buhlman method, the margin of prudence is estimated at 8% of the central estimate with a standard error of approximately 3%.
8.77 It may be argued that the present split between provision for unearned premiums and provision for unexpired risk is not suitable and may even be confusing. In a rather straightforward manner all claim payments arising from future events insured under existing policies up until their next renewal are related to risks being unexpired at the balance sheet date (the reporting date).46

8.78 Moreover, the present split does not seem to be compatible with the anticipated phase II of the IFRS on insurance contracts. It is likely that under IAS the two items may be replaced by a single provision for unexpired risks, on a basis similar to that envisaged for claims outstanding. However, this change may be largely presentational and it is asserted that the unearned premium in general will be a floor to the provision for unexpired risks.

8.79 Based on the comments above, a slightly revised wording of the rules regarding the provision for unexpired risks may be as follows:

The provision for unexpired risks should comprise the amount set aside in respect of risks to be borne by the insurance undertaking after the end of the financial year, in order to provide for all claims and expenses in connection with insurance contracts in force.

This wording could be amended in the following manner:

The provision for unexpired risks should in any case at least equal the unearned premiums calculated according to a recognised method.47

With this revised wording of the rules regarding the provision for unexpired risks a separate provision for unearned premiums would become superfluous.

8.80 Moreover, it should be stressed that it is still necessary to clarify to what extent (administrative) expenses – beyond (expected) claims handling and claims settlement expenses related to the claims stemming from "the future events insured under existing policies up until their next renewal"48 – should be covered by this provision, cf. the present wording of Article 58 of the Accounting Directive.

Methodological issues

8.81 The relative amount of premium provisions to outstanding claims provisions varies from undertaking to undertaking (for example due to business mix) and depends on market practice (due to market practices of writing new business and of paying claims). For example,

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46 Additional liabilities may arise for multi-year contracts or where there are guarantees and options.

47 Less deferred acquisition costs, where these are not recognised as an asset. In this regard, account will have to be taken of the results of the IASB project.

they represent 10% of outstanding claims provisions in Germany, and 30% in Portugal.

8.82 Many issues related to the Premium Provisions are closely connected to the Outstanding Claims Provisions and have been addressed above. However premium provisions present some specific issues.

8.83 First, from a practical point of view, it must be mentioned that the estimation of premium provisions do not rely on the same tools (although, naturally, a proper valuation of claims is a pre-requisite for a undertaking to set premiums – and premiums liabilities). The estimation of the outstanding claims liabilities is built on well-defined historical statistics and methodologies. Fewer data and methods are available for the estimation of the premium liabilities.

8.84 Moreover, the uncertainties related to the premium liabilities are typically larger than the uncertainties related to the outstanding claims liabilities. Premium liabilities have to be considered having regard to the potentially higher volatility, as the exposure period of these liabilities, differently from claims provisions, belongs to the future. The fact that projected payments relating to Premiums Liabilities relate to events that are yet to occur generates an important source of uncertainties.

8.85 The relatively higher degree of uncertainty related to the premium liabilities is also referred to in the APRA Guidance Note on actuarial opinions and reports on non-life insurance. While discussing whether the valuation principles applied for the outstanding claims liabilities can be applied for the premium liabilities as well, the Guidance Note states:

"it is recognised that, as a full actuarial valuation of Premiums Liabilities is essentially a re-underwriting of the portfolio, it may not be appropriate or even possible to undertake as complete a valuation as is appropriate for Outstanding Claims Liabilities".

The higher volatility related to the premium liabilities should lead to a more significant risk margin.

8.86 If renewals are concentrated to one date, the premium provision is very low the day before this date. This is the case in commercial and industrial lines where the policy period is often the calendar year, and hence the premium provision as at December 31 is considerably lower than it would be at other dates of the year. However, the risk margin should not result in an incentive for insurers to underwrite all their policies at the beginning of the year. Actually, on an on-going basis, an undertaking for which renewal has effect beginning January is exposed to the same uncertainty for supervisory purposes as one with its renewal in July.

8.87 Therefore it could be more appropriate to address the supplementary volatility of the claims yet to come under the SCR. With this approach, a more deterministic calculation of premium provisions (unearned premiums + unexpired risks) could be adopted, e.g. on the basis of an analysis of the claims/premiums ratios over the past years. A possibility
to use more sophisticated methods, by derogation to this simple rule, could be envisaged.

8.88 More specific issues should briefly be mentioned: one of them concerns the handling of multiyear contracts. In general terms it seems reasonable to expect that the uncertainty related to the premium liabilities for such contracts could be considerably higher than the uncertainty related to the premium liabilities for one-year contracts. Accordingly, the ratio of the risk margin to the central estimate of the CBNI-payments should be higher for multiyear contracts. On the other hand, when stipulating the central estimate and risk margin for CBNI-payments related to multiyear contracts, the relevant terms and conditions regarding e.g. the premiums rates (including possible clauses for adjusting premium rates during the duration of the contract) should be taken into consideration. Provisions relating to reinstatements in reinsurance also need to be considered.

**Equalisation mechanism**

8.89 The current EU regulation regarding technical provisions includes the need for equalisation provisions. These provisions generally provide additional safety margins in volatile areas of non-life business and may work as a 'countercyclical tool'. More precisely, they are used for two purposes: equalising claims ratio over time, and providing catastrophe reserves for special risks.

8.90 Equalisation provisions are currently in addition to the requirement to set up outstanding claims provisions, and they form part of the technical provisions of the insurer. Conversely, in the IASB framework, equalisation provisions are unlikely to be included as a technical provision. However, the removal of this item could result in increasing the risk insurers are exposed to when significant claims arise. The impact of future catastrophes and adverse claims experience has to be taken into account when assessing the need to maintain sufficient reserves in the future solvency system. Therefore, an equalisation mechanism should be considered as a possible component of the prudential regime.

**Possible approaches**

8.91 The first approach would be to maintain the current system, where amounts set aside to face future catastrophes or adverse claims experience are treated as provisions. The main advantage of this approach is that the amounts set aside during favourable years are tax-free. This allows for consistency and durability of the system, since the reserve to pay extra claims during future adverse years is not paid out in the form of taxes and dividends.

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49 Article 6 Accounting Directive.

50 IFRS 4 states that insurers shall not recognise equalisation provisions as a liability.
8.92 Under this approach, the rules prescribing the amount that has to be moved to or from the equalisation provision should be quite strict, in order to prevent the insurers from manipulating the taxable profit by manipulating the equalisation provision. Disclosure should also be required in the statutory accounts to ensure that the supervisor and other stakeholders fully appreciate the impact of the provisions used to equalise claims ratios over time and catastrophe reserves. Moreover, if insurance undertakings are allowed to set aside equalisation provisions to cover a significant part of their exposure, particular attention should be given to the effect of these reserves on the assessing of the underwriting risk in the SCR calculation.

8.93 To facilitate the link with the SCR, an alternative approach would be to regard equalisation reserves as a component of the available capital rather than as liabilities. This would be more in line with IASB, where it seems likely that equalisation provisions will be classified as own funds.

8.94 It has been suggested that there is a need for reserves to equalise fluctuations in future claims experience. To reflect this need, this approach could be complemented by introducing a compulsory equalisation mechanism that would lead to an addition to the solvency capital requirement, with the aim also of promoting solvency on a long term basis. Under this approach, it has to be discussed if this mechanism could also result in a deduction from the solvency capital requirement or it can only lead to adding a 'buffer' to the SCR. It is possible that such a mechanism might work as a 'countercyclical tool', reducing pro-cyclical effects inherent in an application of a risk-sensitive capital requirement, and smoothing out the ratio of available vs. required solvency capital over time. CEIOPS will address the issue of pro-cyclicality in more detail in its response to the CfA 22 on procyclicality. The second purpose of equalisation provisions (providing catastrophe reserves for special risks) should be addressed, prior to any compulsory equalisation mechanism, in the calculation of the SCR itself. Indeed, the SCR should allow for potential catastrophes (having regard to the 0.5% probability of ruin). For example, stress tests could be used to calculate a component of the SCR regarding catastrophic events. CEIOPS will address these issues in its response to CfAs 10 and 11 (SCR standard formula and internal models).

8.95 It would also seem possible to combine the two approaches as described above, i.e. to continue to require equalisation provisions for certain lines of business in statutory accounts, but to classify these provisions as available capital for the purposes of a solvency assessment. Under such an approach, the calculation of such statutory equalisation reserves should be made more transparent.

Harmonisation at European level

8.96 In the current system, there is an extreme diversity in the national implementation of requirements for insurance undertakings to establish and maintain equalisation reserves. This variety has a direct

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51 CEIOPS-CP-06/05, available on CEIOPS’ website: www.ceiops.org.
consequence on the balance sheets of insurance companies: as an illustration, equalisation provisions represent 1% of the net premiums in Sweden and more than 60% in Finland\textsuperscript{52}.

8.97 There is a clear need for harmonising the treatment of equalisation reserves for the purposes of solvency assessment. Whether there is a need to improve consistency between Member States, as regards the compulsory nature of these reserves, their tax treatment and the rules of calculation for other purposes needs to be considered further.

The management of technical provisions (life & non-life)

8.98 According to current IAIS core principles technical provisions of an insurer have to be adequate, reliable, objective and allow comparison across insurers.

8.99 The management estimation of technical provisions is an ongoing process that is required to ensure that the technical provisions are adequate for covering the liabilities especially with respect to policyholder protection, by using appropriate underwriting as well as provisioning. There are two aspects to this: the business management of all risks and exposures related to this; and the estimation, reporting and monitoring of technical provisions. This process continues as a cycle of management of the business over time at least annually.\textsuperscript{53} This 'experience based' process tends to be a strong feature of insurance management practices, perhaps more so than in other types of financial institutions. The process affects not only provisioning, but also the setting of premiums. However, past experience should be used with caution, as it is not always predictive of the future.

8.100 The methodologies and accounting practices used in establishing the technical provisions and in the treatment of the assets, particularly those available to cover the technical provisions, have to be considered when forming the solvency requirements that build upon the technical provisions. Nevertheless CEIOPS recognises that a harmonisation is under way.

8.101 Reliability and comparability of technical provisions is enhanced by the use of experts. The objective assessment of provisions means an unbiased assessment using an objective actuarial and management process.

8.102 It is important for the management of technical provisions to set out goals in what to achieve by a proper management. Whilst shareholders, policyholders, tax authorities, analysts and others have an interest in

\textsuperscript{52} MARKT/2529/02 (2002) - Report of the working group on non-life technical provisions to the IC Solvency Subcommittee.

\textsuperscript{53} According to IFRS 4 (Liability Adequacy Testing) an insurer shall assess at each reporting date whether its recognised insurance liabilities are adequate, using current estimates of future cash flows under its insurance contracts. If that assessment shows that the carrying amount of its insurance liabilities is inadequate in the light of the estimated future cash flows, the entire deficiency shall be recognised in profit or loss.
how technical provisions are estimated and their adequacy assessed, there are three bodies that are particularly interested from a regulatory perspective: the Board of Directors of the insurance undertaking, external auditors, and supervisory authorities.

- The Board of Directors and Senior Management have the responsibility for preparing financial statements which show a true and fair position of the undertaking on which present and future policyholders, shareholders, and supervisory authorities may expect to rely. The Board of Directors is responsible for managing the insurance business in a sound and prudent manner for which reliable information on the past adequacy and likely future adequacy of technical provisions is an essential component. In order to discharge these responsibilities it should be advised by competent actuarial experts. This actuarial function may be performed by experts employed by the insurer or by experts engaged by the insurer.

- External auditors have a duty to scrutinise the financial statements prepared by the insurer and approved by the Board in order to assess the adequacy of the technical provisions. They must therefore be independent, and to this end, should not rely exclusively on the same actuarial function as the Board relies on for advice.

- Supervisory authorities need to ensure that the insurer is able to meet its obligations to policyholders and that the insurer's business is being managed on a sound and prudent basis. They therefore need to ensure that either the actuarial advice the Board relies upon is given by competent persons with an appropriate remit, or subject those technical provisions to separate scrutiny (either itself or by experts they engage), or both.

8.103 There is a danger that if all three bodies rely on the same person or actuarial function, that person may find it difficult to give unbiased advice to one or all of those bodies. This risk seems particularly acute if the actuarial function is carried out by a member of the insurer's Board of Directors54.

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**CEIOPS’ Advice**

**Quantitative standard for technical provisions**

8.104 A quantitative prudence level for technical provisions can be envisaged in the future Solvency II framework. It should generally be applied separately for provisions for outstanding claims and premium provisions.

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54 See also Annex to CFA 16 on Fit and Proper, A.14.
In some cases, the probability distribution for insurance liabilities entered into could be very skewed. As a result of this skewing, insurance liabilities set by reference to the given distribution percentile will not always be found to be adequate. Consequently, the risk margin on the expected value should not be less than a proportion of the standard deviation.

The risk margin related to the quantitative level of prudence should be calculated by line of business. However, the relevance of additional levels of aggregation of claims (higher or lower levels) will need to be considered. EU reporting classes from the Accounting Directive could be used as a starting point. Supplementary to such classes, a set of criteria could be defined to determine cases where a further subdivision of an insurer’s business into homogenous risk groups would seem appropriate. In particular, CEIOPS would need to assess whether these homogenous risk groups might vary from national market to national market, according to criteria defined at EU level. CEIOPS will consider further how diversification effects between lines of business or homogenous risk groups could be taken into account where demonstrably based on sound actuarial techniques. This should be tested in QIS.

The principle of a general quantitative standard should be supplemented by a set of minimum requirements on the use of statistical methods, including a requirement where practicable to use at least two different statistical approaches to provisioning.

The principle of a general quantitative standard should be stated in such a way that it is compatible with cases where statistical methods cannot or need not be applied.

It is desirable to have a quantitative requirement on gross provisions and one on net provisions. The articulation of these two requirements requires further analysis.

Requirements on provisioning procedures should be developed with a view to ensure good quality data and the adequacy of methods used in the valuation of the risk margin.

A set of common reporting tools for supervisory purposes could be usefully developed across the EU.

CEIOPS has not yet determined a view on discounting. The costs and benefits of different discounting methods (considering also the absence

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55 One CEIOPS member notes that the implications of this floor on achieving the benchmark level of prudence would need to be assessed.

56 Some CEIOPS members hold the view that this advice is premature, and that the inclusion or otherwise of equalisation provisions in the future system requires further consideration.

57 Although an actuary can be a member of the board, the Board as a whole should have access to independent actuarial advice, internal or external.

58 See Annex A to answer on CfA 16 on Fit and Proper which proposes a framework for the actuarial function.
of discounting) require further analysis.

**Provision for claims outstanding**

8.113 A general quantitative standard should supplement the current case-by-case estimation principle. Conceptually, a statistical estimate of the provisions according to a given quantitative standard might be acceptable in itself, provided that the appropriateness and reliability of such an estimate could be demonstrated, and that differences relative to the case-by-case estimation can be explained (e.g. differences stemming from diversification effects). For statutory accounting, the case-by-case estimation principle might be upheld, serving as a floor to the statistical evaluation. QIS seem necessary to further analyse the relationship between the aggregate of the case estimates and the statistical estimate.

**Premium Provisions**

8.114 Premium provisions could be replaced by a single provision for unexpired risks, with the unearned premiums as a floor.\(^{55}\)

8.115 Specific methods for the calculation of prudence level in premium provisions need further studies. Especially, the consistency with the SCR formula must be carefully looked at to avoid double charge (in provisions and in capital requirements).

**Equalisation mechanism**

8.116 Equalisation provisions should be treated as part of capital for the purpose of meeting the SCR. However, CEIOPS recommends continuing to require equalisation provisions for certain lines of business in statutory accounts to smooth out claims ratios over time and as catastrophe reserves.\(^ {56}\)

**The management of technical provisions (life & non-life)**

8.117 CEIOPS supports the inclusion of high-level general requirements on insurance undertakings to manage their technical provisions.

*Role and responsibility of the Board of Directors and Senior Management in the management of technical provisions*

8.118 The Board of Directors shall approve the strategy for implementing the principles proposed by CEIOPS for estimating and reporting the technical provisions. This strategy should be integrated in the overall risk management strategy.

8.119 The senior managers shall establish, in writing and in a clear way, the policies and operational procedures for implementing the principles proposed by CEIOPS for estimating and reporting technical provisions.
This shall be reviewed, at least annually and whenever there are changes in the insurance undertaking’s circumstances or new information that may be significant to technical provisions.

**Data used in the valuation of technical provisions**

8.120 Suitable controls, systems and procedures should be in place to ensure the reliability, sufficiency and adequacy of both the statistical and accounting data to be considered in the valuation of technical provisions. For provisions to be considered, reliable backtesting of the methods used against the run-off of claims reserves (in particular the mathematical-statistical methods for the evaluation of technical provisions along with the quality of the underlying claim data) must be carried out in proper form and in line with approved procedures. The SCR capital charge for reserve risk allows only for run-off losses during the limited solvency assessment time horizon. Therefore, the allocation of capital does not solve the underlying problem when technical provisions have been underestimated and cannot be a permanent solution with respect to prudent technical provisions. Where technical provisions prove inadequate it is therefore not sufficient to rely on the SCR capital charge and the insurance undertaking has to ensure that the causes for the run-off-losses incurred by increasing the level of its technical provisions are remedied.

8.121 Strict internal controls should be in place namely, in the cases where algorithms are used to process data under computing systems.

8.122 The data should be complete; e.g., for claims provisions all claims reported should be introduced in the systems.

8.123 It should be ensured that all the liabilities are taken into account, namely that the products are well understood and that all the options embedded in the products are taken into account.

8.124 Insurers must be able to explain their methodologies in collecting the data used to calculate the technical provision, including how they have checked their data and dealt with data irregularities.

8.125 The requirements for the data and the overall calculation system should be established having regard to the characteristics of each company, namely the specific requirements of the users (e.g. the actuary), the data sources available and the homogeneity of the groups of insurance or persons insured.

**IT system**

8.126 To support the adequate valuation of the technical provisions, resources in terms of staff, equipment and software allocated in IT should be appropriate, both in quality and in quantity, for ensuring that the systems and controls are effective and reliable at all times.
Staff that fully understands the risk covered in the policies

8.127 The insurer must ensure that the staff assessing and valuating the technical provisions adequately understands the risks covered by and associated with each contract.

8.128 Proper internal control procedures should be developed regarding the staff dealing with technical provisions, through an appropriate segregation of duties, namely regarding the reporting, assessment and processing of claims.

Actuarial function regarding technical provisions

8.129 The actuarial function plays an essential role in the proper assessment of the technical provisions.

8.130 Insurance undertakings are required to ensure that they take competent and appropriate actuarial advice into account when making their decisions on provisioning. CEIOPS is aware that the actuarial function will likely include also other areas like capital adequacy or business strategy. Competent means from a person with the expertise, experience, and personal skills commensurate with the complexity and risk of the undertaking's business (see Annex A to CfA 16 on Fit and Proper). The advice should be appropriately independent of the Board.

8.131 External auditors should have an independent oversight from the Board of Directors and should have their own actuarial function or have access to actuarial advice independent of the actuarial function advising the Board of Directors. This is in order to allow assessing internal actuarial analysis.

8.132 Supervisory authorities assess whether the insurance undertaking's actuarial function has sufficient expertise, experience, and personal skills for the supervisor to rely on its assessment. They check that this function is appropriately segregated and not subject to any non-technical influence by the Board of Directors and/or Senior Management.57

8.133 The objectives of the actuarial function within insurance undertakings should be harmonized.58.

Reinsurance arrangements

8.134 Suitable systems should be in place to ensure that reinsurance recoveries are identified and appropriately recorded on a timely basis.

8.135 There should be guidelines for assessing credit risk in technical provisions for amounts recoverable (including amounts contingently recoverable) under reinsurance arrangements. (This also relates to CfA 12). The risk that the insurer will not be able to pay the claims as they fall due because of insufficient reinsurance is an insurance related risk,
but the exposure to the reinsurer is a counterparty risk.

*Reporting to Senior Management and the Board of Directors*

8.136 The risk management and internal control should include procedures of reporting, namely, of the actuarial function, to the Board of Directors that shall describe the level of compliance with the rules proposed by CEIOPS for the valuation of technical provisions.
Call for Advice No. 9

Safety measures

Extract from the Call for Advice:

The Commission Services seek CEIOPS’ advice on the safety measures that would be appropriate in the new solvency framework. The goal is a simple and consistent framework where the main focus is on effective risk management instead of copious prescriptive limits. The analysis and proposals should include:

- Review of the MCR (Article 28). ...

- Authorised categories of assets covering technical provisions (Article 23) have be revised in line with the new solvency methodology while also taking into account financial market developments. ...

- Some quantitative limits for asset diversification for supervisory purposes with a view to maximum harmonisation (Article 14). However, the prudent man approach and the asset-liability requirement will lead to more stringent limitations than those safety measures, in most cases. In addition, the proposals should take the following aspects into account:
  - investment risks (including currency risk, Article 26) should be the primary focus of the SCR calculation;
  - some classes of authorised assets should be subject to restrictions (e.g. real estate, unsecured loans, and unquoted securities).

Moreover the available solvency margin (Article 27) should be modified to take into account the new prudential levels of the solvency system and international compatibility (IASB rules and IAIS, IAA and Basle II developments), and where appropriate, financial market developments (e.g. new innovative forms of capital or capital substitute). This area of work will be addressed later in more detail in a Specific Call for Advice.

Background

9.1 This specific CfA concerns Articles 23-24 and 26-31 in the Recast Life Directive and equivalent articles in the Non-Life Directives. The Commission Services presented no draft wording as they wish to receive the advice from CEIOPS.
Explanatory text

Minimum Capital Requirement

Purpose

9.2 The Commission’s Amended Framework for Consultation\textsuperscript{59} envisages two main capital requirements under Pillar I: the Solvency Capital Requirement (SCR) and the Minimum Capital Requirement (MCR). The MCR is intended to provide a safety net. This means that, on an ongoing basis, the MCR does not necessarily represent an adequate level of capital. But a level of capital below the MCR is clearly unacceptable, even over the short term. While temporary breaches of the SCR might be tolerated – subject to the prospect of restorative action – a breach of the MCR could not be tolerated.

Design priorities

9.3 The Commission’s Amended Framework for Consultation and CfA 9 set the following design priorities for the MCR:

- simple and straightforward calculation;
- robustness;
- objectivity;
- smooth transition.

9.4 As the MCR will trigger the most serious supervisory intervention, its calculation needs to be simple, robust and objective.

9.5 While a combination of factor-based and scenario approaches are feasible for the calculation of the SCR, a factor-based approach is more suitable for the purposes of the MCR, since the advantages of factor-based approaches are consistent with the above priorities.

9.6 The MCR should not be a volatile measure. Some undertakings may seek to maintain large capital buffers over and above the requirement to mitigate the risk of serious supervisory intervention arising from the breach.

9.7 To provide an effective safety net, internal models would not be allowed to replace, or affect, the calculation of the MCR.

9.8 For smooth transition, the presumption might be towards the retention of existing requirements, unless an alternative could be shown to be demonstrably preferable. In the case of the adoption of an alternative approach, the existing requirements may be retained for a transitional period.

\textsuperscript{59} MARKT/2506/04 (2005) – Amended Framework for Consultation on Solvency II.
9.9 In addition to the priorities set by the Commission, CEIOPS suggests, when judging the merits of a MCR approach, to consider also the following preferences:

- risk sensitivity;
- suitability for interim calculations;
- reference to audited/auditable data only;
- consistency with the valuation standards for assets and liabilities and the calculation of the SCR.

9.10 There is a familiar trade-off between risk sensitivity and the need for simplicity. It should be recognised that any genuinely simple formula would have limitations. Therefore, pressure would always develop to refine the formula to address those limitations. Adding new items in an iterative process may eventually result in the loss of simplicity, transparency and objectivity. The MCR could be optimised for simplicity while the SCR could be optimised for risk-sensitivity.

9.11 The insurer must meet its capital requirements at any time, not only at the balance sheet date. When the SCR is breached, both the insurer and the supervisor must be able to constantly monitor the undertaking’s solvency situation, to enable timely reaction. Therefore the structure of the MCR formula should enable interim calculations at any point of time in the year.

9.12 The need in certain Member States to support MCR level intervention with court decisions raises the expectation that only audited data are used. There is a tension between this, the need for timely intervention and the possible need for interim calculations.

9.13 The scope of data that are audited, auditable, or are in the annual accounts or supervisory reporting may vary according to the Member State. However, the data requirements for the MCR would need to be reasonably simple, both to reduce the administrative burden on insurers and to allow a straightforward verification.

9.14 Regarding the calculation of the MCR, CEIOPS considered the following alternatives:

- adopting a calculation based on the existing Solvency I requirements;
- using the SCR standard formula as a reference; and
- establishing a simple risk margin over and above liabilities.

Combinations of these alternatives might also be viable – for example, using the higher of the Solvency I requirements and a margin over liabilities.
9.15 Solvency II could also employ a dynamic approach: retaining the existing requirements for a transitional period before adopting one of the alternatives.

- **A formula based on the existing Solvency I**

9.16 A formula based on the existing requirement has the advantage of continuity with the existing regime, which also reduces the risk of modelling error associated with the innovative and yet unproven SCR. Transitional costs for undertakings, as well as the expenses of developing and testing a formula would also be minimised.

9.17 Against this, an MCR based on Solvency I would import the disadvantages of the existing requirements into Solvency II. It is difficult to identify an underlying theoretical basis for the present requirements, so it would also be difficult to demonstrate how the MCR achieved the purpose set out in CEIOPS’ working definition. Even if additional risk categories were added, there would be a lack of consistency with the treatment of underwriting risk under the SCR. However, it may not be essential for the MCR to measure risks precisely in order to provide an effective safety net. Although the theoretical basis of the current formula may have been forgotten, several working groups of supervisors have recognised that the solvency margin worked well, at least as a safety net.

9.18 Since the definition of the technical provisions is going to change (and, for some Member States, changes in asset valuation will impact the level of available capital), even when the existing Solvency I calculations are retained, the combined requirement of technical provisions plus the MCR is going to change. This also means that, even if the existing calculations are adopted, a review of the factors via QIS will be necessary.

9.19 Assuming that the existing formula is retained without major changes, the following adjustments need to be/might be considered:

- adjustments to ensure IASB compatibility;
- adjustments aimed to correct minor anomalies without added complexity; and
- shortcuts aiming for more simplicity, where this can be done without significant loss of risk sensitivity; considering also that the SCR will be able to capture risks more elaborately.

9.20 The use of some approximations could be allowed to facilitate interim calculations. However, if the existing formulae are retained for a transitional period only, it is suggested to keep adjustments to the absolute minimum necessary, since marginal improvements would not justify the additional costs of a double reform.

9.21 In its present form, the non-life formula captures mainly underwriting risk. While the core formula uses balance sheet and profit-and-loss items, the differentiation of the factors according to business lines
leads to data requirements that are normally not part of the balance sheet or profit-and-loss. The differentiation does not always follow the present EU classification from the Accounting Directive.

9.22 There is a concern whether the non-life formula is conducive for interim calculations. While some members argue that the formula is easy to calculate throughout the year and does not represent an undue burden, other members (including one member where a quarterly reporting scheme based on Solvency I is in place) hold the view that the data requirement of the non-life formula is not well aligned to interim calculations.

9.23 In particular, because it takes into account the history of the last three years, it cannot reflect recent changes in the nature of the portfolio. A related complication is the treatment of portfolio transfer situations where, to reflect the change of the portfolio reference has to be made to revenue data of another insurer (or several other insurers).

9.24 A number of changes might be considered to improve its suitability for interim calculations, and to better deal with portfolio transfer situations. Illustrative examples include:

- changing the reflection of reinsurance;
- replacing the 3-year claims index by a provision index (this would be a move towards the margin over liabilities approach): this would also make unnecessary the additional requirement that the MCR must not fall at a faster rate than claims provisions;\(^{60}\)
- using just one definition of premiums as a basis for the premium index, in lieu of the maximum of gross premiums earned and gross premiums written; and
- using twelve-month rolling accounting figures.

9.25 The existing life formula attempts to capture underwriting risk and investment risk. Note that the margin only depends on whether the contracts involve an investment risk to the undertaking, not on the level of investment risk.

9.26 The result of the calculation depends on the definition of life technical provisions. If the formula is retained, recalibration of the factors may be suggested by the results of field testing. The potential volatility of results also needs to be field-tested (e.g. the sensitivity of the MCR to interest rate changes).

9.27 The differentiation of the factors according to contract types and the reliance on capital at risk data leads to data requirements that are normally not part of the balance sheet or profit-and-loss.

\(^{60}\) The introduction of a provision index was largely discussed, and at the end rejected, within the Solvency I project (see Group Müller Report – Conference of the Insurance Supervisory Authorities of the Member States of the European Union (1997) (Solvency of insurance undertakings) - for more detailed references), because of potential paradoxical effects (insurers with lower provisions would be subject to lower requirements).
9.28 The life formula yields itself well to interim calculations (except for supplementary insurance where the calculation follows the non-life requirement).

- **A simple calculation based on the SCR standard formula**

9.29 The advantage of a simple calculation based on the standard formula of the SCR is that it would be fully integrated into the new risk-based framework and would be consistent with the overall prudential objectives of the new regime. By making sure that the insurance undertakings' capital requirement is more closely aligned with the risks they face, the new framework would reinforce financial stability and promote the competitiveness of European industry.

9.30 On the other hand, the feasibility of this approach is fully dependent on the progress, testing, and eventual success of the SCR standard formula. Therefore if this approach is adopted, a transitional period between the introduction of the SCR and the adaptation of the MCR is suggested. For the duration of this period the minimum capital requirement defined in Solvency I could apply.

9.31 The simplest approach would be to fix the MCR as a fraction of the SCR. (Note that SCR here means the standard SCR, as internal models are not to be allowed for the calculation of the MCR.) This shortcut, however, would not be aligned with the theoretical basis of the SCR (VaR or TVaR based on a probability of ruin), and would not deliver a common level of prudence. Moreover, in this case the calculation of the MCR would not be more simple and robust than the calculation of the SCR. Further work is needed on this issue.

9.32 Another option would be a simplified version of the standard SCR formula that would concentrate on the most important risk categories, possibly using a more straightforward technique for aggregation, and calibrated to a lower level of prudence than the SCR. Scenario-based elements of the SCR formula might be replaced with factor-based items for the purposes of the MCR.

- **MCR as a risk margin over and above liabilities**

9.33 Making the MCR a simple proportion of liabilities is another relevant approach. The formula could be recalculated with ease, at least approximately, throughout the year.

9.34 All liabilities should be covered in principle, including liabilities under contracts that under international accounting standards are required to be treated as financial contracts. Any liability to which minimal uncertainty attaches (e.g. current liabilities for agreed amounts) might be excluded, provided that this does not increase the complexity of the calculation disproportionately to the increase in accuracy.

9.35 In life insurance, a MCR expressed as a margin over liabilities is similar, but not identical to the Solvency I capital requirement.
9.36 A precondition for a MCR calculated as a margin over liabilities is the harmonisation of technical provisions. In this approach, the main concern is the ability of the insurer to meet its liabilities in a run-off situation. Risks associated with new business are not reflected, assuming that an insurer that fails to meet the MCR will not be permitted to write new business.

9.37 However, the MCR is relevant not only for those undertakings that already breached it, but also for the undertakings that meet the MCR. There is a concern that the liabilities basis alone will not adequately reflect the true risk e.g. in the case of short term business with a low amount of provisions, or in the case of new/rapidly growing undertakings. If field testing shows that this is a serious shortcoming, a combination of the liabilities result with another volume measure (like the premiums for example), or with two volume measures (premiums and claims, as in the current solvency margin) might address this problem, although at the cost of some added complexity. Consideration needs to be given whether a maximum approach (as in the current solvency margin) would appear preferable to any additive approach.

9.38 For short-term claims business, the level of the overall liabilities would be driven mainly by the provision for unearned premiums. This may lead to undesirable effects in cases where the level of unearned premiums fluctuates significantly throughout the year (e.g. where a large proportion of the insurer’s business consists of contracts with similar periods of cover).

9.39 Operational risk is hard to quantify and for the purpose of the MCR only a rough and ready allowance can be made. The amount of the liabilities might be a suitable proxy for the potential exposure. This allows operational risk to be covered by a loading to the factors that are applied to the liabilities for the purpose of calculating the liability risk. Alternatively, a measure based on premiums could be developed.

9.40 Issues for a MCR based on liabilities include:

- How should the liabilities be verified?
- Should different factors be used for different types of liability?
- What allowance should be given for diversification, between different lines of business and between different claims within a line?
- How should reinsured liabilities be treated to appropriately reflect and encourage a transfer of risk?
- Calibration (having regard to the basis used to estimate the liabilities).

9.41 If the liabilities are underestimated so will be the MCR. While this is only a second order effect, it is still important that the liabilities are estimated as accurately as possible and that the insurer does not
underestimate them, deliberately or otherwise. This should be considered as part of the SRP.

9.42 It would be possible to elaborate the formula by applying different factors to different lines of business or different types of provision. Additional factors should only be introduced if it was clear that this significantly increased the accuracy of the MCR.

9.43 Regarding diversification, while an additive approach may be preferable for reasons of simplicity, some consideration should nevertheless be given to the possibility of allowing for some diversification benefit if a simple adjustment could be devised, and that adjustment was significantly better at representing the risk.

**Investment risk in the MCR**

9.44 Under all approaches, there is an issue whether the MCR should include an allowance for investment risk. To provide advice on this point, the following should be considered:

- whether the investment risk is sufficiently material for those undertakings that have breached the SCR, taking account of the potentially shorter time horizon of supervisory intervention, to justify the increased complexity;

- whether it is possible to properly reflect investment risk by way of a simple factor-based calculation (e.g. indirectly by applying a ratio on liabilities); and

- the extent to which other safety nets (e.g. investment rules) reduce the need to reflect investment risk in the MCR.

9.45 It may be argued that an insurer that fails to meet its MCR cannot afford to take any risks with its investments. Any insurer that fails to meet its SCR will be expected to take action to restore its position and one of the actions it might decide to take is to rearrange its investments to reduce risks and so the SCR. If this 'de-risking' response can be generally anticipated, and the extent of 'de-risking' increases as available capital nears the MCR, the risks associated with investments should reduce and there is no need for the MCR itself to reflect investment risks.

9.46 Conversely, such a 'de-risking' response might not be generally anticipated for a life insurer carrying on with-profits insurance because of commitments to policyholders. Such an insurer may choose other remedial actions to restore its financial resources which do not reduce the risks associated with its investments. Thus an MCR for life insurance may need to reflect some investment risks.

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61 Note that in an ALM context investment risk relates to both assets and liabilities.

62 One member notes that as a consequence of considering market risk and credit risk in an ALM context the de-risking argument may still be valid for a life insurer carrying on with-profits insurance. However,
Review of the factors

9.47 The future regime should enable the review of the factors of the MCR formula to follow market developments over the long term. At the same time, the review cycle should avoid hectic changes to the factors, and the industry needs to be given adequate time for preparation whenever the factors are adjusted.

Interplay with the SCR

9.48 At any time, the MCR will be a floor for the SCR. In some cases the result suggested by the SCR calculation (although not the requirement itself) will be lower than the MCR, in other cases the SCR might be above, but very close to, the MCR.

9.49 Only field testing will reveal how frequently this happens. While adjusting the factors in the formulae may reduce the number of such situations, it is unlikely that they can be avoided entirely. Even if the MCR formula was based on the standard SCR, the SCR estimate suggested by an internal model (although not the requirement itself) may fall below the MCR.

9.50 The future regime, on the other hand, would need to avoid abrupt shifts from the 'no intervention' control level to the level of 'ultimate intervention': the relative levels of the SCR and the MCR should be calibrated so that the SCR represents a meaningful margin over the MCR for most insurers.

9.51 Possible approaches to deal with this problem are

- setting a floor to the SCR equal to MCR × j (where j ≥ 1);
- basing the MCR on the SCR (either as a fixed percentage of the SCR, or by omitting some of its components); or
- changing the definition of ruin under the SCR so that it is based on having sufficient capital at the end of the time horizon to cover both the technical provisions and the prospective MCR calculated at that time.63

The special case of the SCR coinciding with the MCR is also discussed in para. 15.19. The solution may be left entirely to Pillar II, leaving it to the supervisor to decide (subject to level 3 guidance on supervisory convergence) what to do in cases when the SCR and the MCR are close to each other. In effect, having the SCR and the MCR close to each other could simply mean that the MCR is overstating the risk.

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63 Note that the advice under CfA 10 does not envisage this definition of ruin.
'Prudent person plus' approach

9.52 In response to the first wave of CfAs\textsuperscript{64} CEIOPS supported the inclusion of high-level general requirements for insurance undertakings to manage their assets and liabilities appropriately.

9.53 Prudent management would be supported by risk-sensitive capital requirements, which would take into account asset and liability risks and the degree of an insurance undertaking's asset liability mismatch. The SCR should therefore serve as an important tool in addressing the risk to which an undertaking is exposed, and encourage good risk management and internal control.

9.54 The SCR should be a risk-sensitive capital requirement. But any formulaic requirement will understate risk in some cases (and overstate it in others). Within the context of the standard formula, some risks will be too complex to address in a simple, mechanistic way - for example, concentration risk. Internal models may address this problem to some extent, but model error will always be present.

9.55 As a result, the SCR will need to be supported by a safety net, consisting of rules on the eligibility of assets and limits on risk concentrations. This safety net would be necessary, irrespective of whether the SCR is calculated using the standard formula, partial internal models or full internal models.

9.56 CEIOPS recognises the need to set out clear criteria for the scope of rules on assets and eligibility and limits on risk concentrations to avoid duplicative treatment of risks that are already treated adequately by the SCR. This does not mean that risks included in the SCR will not also need a 'safety net'. But the intention is that safety nets should not interfere with situations where the SCR is able to assess risks in a proper way. This will be addressed in CEIOPS' further technical work.

9.57 The combination of quantitative and qualitative rules was then termed the 'prudent person plus' approach. These elements are described further in this answer.

Quantitative investment rules


9.59 In Article 20 of the Third Non-Life Directive and Article 22 of the Recast Life Directive, the principles of prudent investments are stated. The assets shall secure the safety, yield and marketability of investments. The undertaking shall ensure that assets are diversified and spread and investments in more risky or non-liquid assets have to be restricted to a prudent level.

\textsuperscript{64} CEIOPS-DOC-03/05, available at CEIOPS' website: www.ceiops.org.
In combination with these principles there are detailed quantitative rules (Articles 22 and Article 24 of the respective Directives).

CEIOPS suggests that the future regime uses a 'prudent person plus' approach. The idea of the 'prudent person plus' approach is the combination of three different types of requirements:

- the risk-based SCR;
- qualitative requirements on the management of assets and liabilities; and
- eligibility criteria for assets, asset-liability mismatches and limits on asset concentrations.

Within this combination, quantitative limits on assets will function as a necessary safety net to help to prevent that the insurer inappropriately manages its assets and liabilities. Such a safety net will also be needed for those types of risks that are in principle covered by the SCR, since the SCR (as any mechanistic capital requirement) will not always be able to assess those risks in a proper way.

**Harmonisation**

The existing investment rules provide minimum harmonisation, and call for the establishment of more detailed national rules. There is also a possibility of undertaking exemptions from certain rules, subject to supervisory approval.

The degree of harmonisation and the scope of national rules and undertaking exemptions in the future regime is a matter of political decision. Following the CfA, CEIOPS assumes that the rules should aim for a higher level of harmonisation.

However, it seems important that some degree of flexibility is maintained to reflect particular characteristics of national markets and to avoid a distortion of competition on an international level due to differences in the structure of products.
9.66 The existing investment rules only affect the assets covering technical provisions. In the future regime there will be investment rules for the coverage of technical provisions, the MCR and the SCR. The question whether the investment rules for different purposes would be the same or different overlaps with CfA 5 on investment management rules.

9.67 It is possible that, in the future regime, some or all of the implicit prudential margins now present in the technical provisions will be included explicitly as part of the risk margin in the provisions. But some of this implicit prudence might also be transferred to the MCR and the SCR. Therefore, to maintain the policyholder safety standards of the existing regime, it might be necessary that the same rules apply to the coverage of the technical provisions, the MCR and the SCR.

9.68 In life insurance, some part of the implicit prudential margins in the current provisions stems from investment risk (since, for example, the interest rates used to discount the provisions are prudently chosen), and may, under the future solvency regime, indeed be covered, at least partly, by the MCR/SCR. Whether or not the absolute value of the provisions will increase or decrease under Solvency II seems to be a separate issue (the valuation of assets will change under Solvency II, so an increase in the level of provisions does not necessarily imply that there is a likewise increase in the level of policyholder safety).

9.69 Another argument supporting a uniform treatment of assets is the fact that the MCR/SCR is a risk buffer that may have to be used up during the solvency assessment time horizon; in such a situation, the insurer should always be able to cover its liabilities with assets of sufficient quality. This could constitute a problem if assets of minor quality were allowed to cover the SCR/MCR.

9.70 Applying the same rules at all three levels has the added advantage of simplicity.

9.71 Against this, there is a concern that applying the same rules to the SCR coverage may prove unduly restrictive, and that the availability of admissible assets would cause difficulties for the companies if the rules for the coverage of technical provisions were extended to the SCR. This depends on how restrictive, or how permissive these rules are.

9.72 The possibility of investment management difficulties arising from investment rules must be properly examined.

9.73 The specific investment rules discussed in this answer would need to be adapted in cases where part of the the investment risk is borne by the policyholder (e.g. unit-linked life business).

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65 To be more precise, the rule that excludes intangible assets from the available solvency margin is in effect an investment rule for the assets covering the capital requirement.

66 CEIOPS-DOC-03/05, available on CEIOPS’ website: www.ceiops.org.


Interplay with the SCR

9.74 Quantitative rules should also be regarded as a necessary safety net to help to prevent that the insurer inappropriately manages its assets and liabilities. This also relates to types of risks that are in principle covered by the SCR, since the SCR (as any mechanistic capital requirement) will not always be able to assess those risks in a proper way.

Eligible assets covering technical provisions, MCR and SCR

9.75 There is a long tradition for limits on the assets covering technical provisions. The assets should take account of the business covered by the undertaking in such a way as to secure the safety, yield and marketability of its investments. The list of eligible assets covering technical provisions could be extended to also have effect on assets covering the MCR and the SCR. In the answer to CfA 5 it was assumed that same rules would apply to those assets as for assets covering technical provisions. But the practicality of this approach needs to be assessed.67

9.76 Reasons for revising the current rules for eligible assets include:

- principles for eligible assets should be consistent with methods used for calculating asset risk in the SCR formula;
- the eligibility of new financial products should be taken into account;
- the list should be easy to apply and update;
- implementing measures should be considered; and
- asset classification for different purposes should aim at simple, coherent and universal rules.

List versus principles

9.77 Asset eligibility could be determined by:

- a prescribed list of acceptable categories;
- outlining the characteristics which assets must (or must not) possess as broad principles; or
- a combination of principles and lists.

9.78 The characteristics of those assets that should be considered eligible (or ineligible) from a risk-based perspective are difficult to capture

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67 CEIOPS notes that there may also be a need for consequential amendments to other Directives – in particular, Directive 2001/17/EC (2001) – Directive on the reorganization and winding-up of insurance undertakings – in order to secure the same degree of policyholder protection.
through a prescribed list. Lists are sometimes also easy to circumvent via asset transformation.

9.79 On the other hand, a list gives less room for interpretation than broad principles, providing a more objective and enforceable safety net than principles alone.

9.80 A combined approach is suggested to retain the advantages of both principles and lists. In a combined approach, to be eligible, an asset must be both listed as eligible and meet the principles. One possible way to achieve this is to determine principles at the directive level, whereas a list of potentially eligible asset classes could be specified in implementing measures.

9.81 Under either a principles-based or list-based approach, asset eligibility could be considered:

- positively: setting out the universe of what is eligible (e.g. anything that meets a set of principles, or any asset that is listed is eligible; everything else is not); or

- negatively: a prescribed list of assets or anything with particular characteristics is defined as being ineligible; everything else is eligible.

9.82 Under a positive list-based approach, market innovations automatically become ineligible when they appear, whereas in a negative list-based approach they are eligible until the list is updated.

_Criteria for eligibility and for updating the list of eligible assets_

9.83 In IAIS’s _Cornerstones for Assessment of Insurers’ Solvency_ dated 11 February 2005, Cornerstone V states that:

"The [solvency] regime should require as a minimum that sufficient assets are available to cover the technical provisions and other liabilities."

Future IAIS standards on assets covering the technical provisions should be considered as a starting point for determining asset eligibility.

9.84 Where there is a very active market, the assets would automatically meet any criterion on realisability. But other assets would take longer to realise, for instance property assets might take 6 months to a year. It may not always be possible to sell debts to third parties and in such cases the debt would have to be retained to maturity. As another example, assets acquired for the purpose of the insurance business (e.g. furniture and fittings, office equipment or property occupied by the insurer) might be retained and written off (expensed) over their useful life (where market value is used the expense is the decline in market value): some items in this category should be regarded only as having value to the extent that they can be used in meeting existing
liabilities, others may have a residual value (in particular property owned by the insurer which may be sold, either after the insurer has moved to other offices or with it as a sitting tenant – i.e. sale and leaseback).

9.85 Specific attention must be directed to possible local classes. Therefore views from stakeholders in all countries are important, so that a local class that would meet the principles is not excluded.

**Limits on concentrations in covering assets and diversification requirements**

*Interplay with the SCR*

9.86 Quantitative rules should be regarded as a necessary safety net to help prevent that the insurer manages its assets and liabilities inappropriately. Clearly, limits alone would not be sufficient to achieve this purpose, but this does not speak against using them. Rather, such limits will help to contribute, together with the SCR and Pillar II measures, to CEIOPS’ supervisory objectives within a ‘prudent person plus’ approach. It is also conceivable that Solvency II could move dynamically from the present safety nets towards more reliance on the SCR in later stages.

9.87 CEIOPS needs to identify those points where limits would be necessary to supplement the SCR.

9.88 The SCR will deal with credit and market risk so they are not discussed further in this context. Exposures to individual assets and counterparties would also be covered in the SCR to the extent possible.

9.89 Exposures to a single industry or to a limited geographical area could be addressed through a more complicated formula, at a degree of complexity that might be considered not justified. A possible way to deal with this kind of concentration is via Pillar II.

9.90 Furthermore, due to the nature of concentration and liquidity risks, it is likely that Pillar I requirements on these risks will be supported by the SRP.

*Limits on exposures to single counterparties*

9.91 CEIOPS notes that an insurer's solvency may be dependent on a single counterparty. CEIOPS therefore considers that the total exposure of an insurer to any single counterparty or group of closely related counterparties (such as all the companies in a group) should not exceed the insurer's capital.\(^{68}\) This could be extended to cover in

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\(^{68}\) That is the excess of the value of eligible assets (see for instance 9.97-9.109 and 9.138) over the value of liabilities (other than those liabilities, such as subordinated debt within limits, that can count as capital).
addition a range of stresses so that even in stressed circumstances\(^{69}\) this applied. While the SCR could, in principle, capture this, it might be that an internal model that met CEIOPS criterion failed to do so, because the probability of failure of the counterparty was considered very improbable.

9.92 By exposure CEIOPS means the amount by which capital would fall if the counterparty is unwilling or unable to meet any part of its liabilities. Thus all contracts with it would become worthless, except to the extent that they were guaranteed by a third party independent of the counterparty, covered by collateral (deposited or mortgaged assets that the insurer could use to meet the liabilities), covered by a enforceable right of offset (which enables the insurer to reduce a liability to the counterparty if it fails to meet liabilities to the insurer).

In principle, the effect of the counterparty’s insolvency on investments in third parties should be taken into account. This definition is intended to take into account the effect of any mitigants and of any indirect exposures. Some technicalities of this proposal would need further analysis.

9.93 Some exceptions to such a limit would be worth considering. The following are discussed below:

- exposure to subsidiaries;
- government bonds, and other loans to governments or guaranteed by them;
- short term bank deposits; and
- reinsurance (because it might be impractical to impose this restriction on reinsurance).

9.94 Subsidiaries can be valued by looking through to their assets and liabilities and consolidating.\(^{70}\) The subsidiary’s assets and liabilities can then be reflected in the calculation of the parent’s SCR. If this is done and indirect exposure to third parties (including other group companies) through the subsidiary are fully taken into account, then direct exposure to the subsidiary could be excluded from the rule. This exclusion would not apply to other group companies (i.e. parents and fellow subsidiaries). The aggregate exposure to the group (other than to subsidiaries) should be taken into account, together with indirect exposures to subsidiaries.

9.95 However, the practicalities of this approach need to be assessed (e.g. when the insurer is not required to consolidate their subsidiaries). In particular, it might be argued that this exception should not apply when the subsidiary bears insurance risk.

\(^{69}\) For instance if interest rates fell, the value of bonds would rise. If assets and liabilities were broadly matched, the capital might not change significantly, but a bond that was 90% of capital might represent 110% of capital. It would be unfortunate if the fall in interest rates led to the insolvency of the issuer.

\(^{70}\) See also answer to CfA 18.
9.96 Government bonds are generally the most secure form of investment. It would therefore be inappropriate to discourage insurers from holding them. Therefore bonds and other government debt issued or guaranteed by Zone A countries\(^{71}\) (or equivalent multi-national institutions) could be excluded from the restriction, although differences in credit risk would need to be reflected in the SCR.

9.97 For small insurers it may be difficult to spread short term bank deposits among several banks. This is a very secure form of investment (at least if the bank is properly regulated) and the insurer could move the deposit to another bank at any hint of difficulty. Therefore for small insurers the benefit arising from reducing exposure to deposits with a bank may be outweighed by the costs. One way of doing this would be by permitting short term deposits with a bank regulated by a Zone A country up to some minimum level (say, 3 million euro) whatever the level of the insurer’s capital.

9.98 Reinsurance is a vital credit risk exposure that needs to be addressed in the future regime. However there are serious practical difficulties in applying concentration limits on exposures to reinsurers. The number of reinsurance suppliers is limited. Unlike in the case of other credit risk exposures, e.g. corporate bonds, an insurer would face a difficulty diversifying its reinsurance exposure.

9.99 Many groups arrange their reinsurance centrally so that all business is reinsured through an in-house reinsurer that retrocedes amounts above its own retention to unrelated reinsurers. This is a perfectly sensible arrangement, provided that it is managed properly and prudently. In addition, other intra-group arrangements exist, either to take advantage of surplus capacity in other group companies or to manage the business more effectively.

9.100 For the above reasons, dependence on a single reinsurer is widespread in a number of national markets.

9.101 Also to consider only the existing exposure to a reinsurer (that is the value of the reinsurance asset) misses the point. The real problem with reinsurance is whether the reinsurer will be able and willing to meet claims, in the event that there is adverse claims experience. However, insurers might be discouraged from purchasing reinsurance from strong reinsurers that they needed to cover extreme events, if in the event rules that limited the amount of recoveries they could recognise meant that they would not be able to continue trading despite reinsurance recoveries that covered their losses.

9.102 Conversely, it might be argued that an exception for exposures to reinsurers cannot be justified, because the claim of an insurer on a given reinsurer may be important. This is all the more crucial as, in future European legislation, collateral upon reinsurance claims will no longer be accepted. On the other hand, future European regulation

\(^{71}\) As defined by Directive 2000/12/EC (2000) – relating to the take-up and pursuit of business of credit institutions.
(including the Reinsurance Directive\textsuperscript{72} and Solvency II) will impose equivalent standards of supervision on direct insurers and reinsurers – including solvency requirements.

9.103 On balance, it seems that a Pillar I rule limiting exposure to reinsurers may not be practical. A situation where an insurer’s solvency is dependant on a single reinsurer should of course be taken seriously. However, a Pillar II approach might be better: such an approach might require insurers to notify their regulator when their actual or potential exposure to a reinsurer exceeds or approaches their actual capital, to explain how that exposure is managed and mitigated, and to demonstrate why that exposure should be regarded as prudent.

Possible rules relating to liquidity

9.104 Illiquid assets will take time to be realised and the value which can be obtained is usually uncertain and may be severely reduced as a result of a forced sale.

9.105 One possibility to address liquidity risk would be a requirement that an insurer has sufficient liquid assets to cover the expected outgo (claims and expenses) over the next 12 months. This safety net would mean that it would not be reliant on further premiums from new or renewal business (or, for life insurance, from continuing contracts) to pay claims.

Limits on exposures to individual asset classes

9.106 CEIOPS considers that the starting point for quantitative limits on investments could be the existing limits defined by the current Directives. These could be formulated as:

- 'hard' limits such that the portion of any asset holding which exceeds the limit is not permitted to cover the technical provisions, the MCR or the SCR;
- a 'softer' variant of the first type of limit, where excess holdings may be recognised partially for the purposes of covering technical provisions, the MCR or the SCR;
- 'prior approval' limits: breaches of such limits are allowed with prior consent of the supervisory authority.

For example, 'prior approval' limits may be used for particular asset classes which show high levels of risk. For these limits, clear qualitative preconditions would have to be set to define circumstances where a breach of such limits could be accepted. For example, it may be required that an insurer uses an investment policy based on an efficient ALM system.

For the calibration of limits, and particularly to establish whether the proposed limits could be uniformly applied to the coverage\(^{73}\) of the technical provisions, the MCR and the SCR, QIS will be helpful.

A degree of flexibility should be maintained at national level to reflect particular characteristics of national markets.

The quantitative limits should be breached only in exceptional circumstances, temporarily and under approval of the Supervisor.

**Qualitative Requirements on the Management of Assets and Liabilities**

In the context of a 'prudent person' approach, this implies discharging duties with care, skill, cautiousness, diligence and due regard to the interests of policyholders. Similar concepts are included in the Reinsurance Directive and the IORP Directive\(^{74}\).

Consequently, although the intention in this specific case is to respond to CfA 9, this answer complements the advice given in the answers to CfAs 5 and 6 and should necessarily build upon CEIOPS’ advice on the Supervisory Review Process (CfA 2)\(^{75}\).

**CEIOPS’ Advice**

**Minimum Capital Requirement**

CEIOPS offers the following working definition of the MCR:

*The MCR reflects a level of capital below which an insurance undertaking’s operations present an unacceptable risk to policyholders. If an undertaking’s available capital falls below the MCR, ultimate supervisory action should be triggered.*

'Ultimate supervisory action' is described in the answers to CfAs 14 and 15.

The MCR should be a simple, robust and objective measure. CEIOPS recommends that it should be calculated by a factor-based formula that is suitable for interim calculations, and its data requirement is auditable and reasonably simple. It should include an absolute floor expressed in Euros.

It is preferable to keep the factors of the MCR formula harmonised at a European level. However, the precondition for this is the successful harmonisation of technical provisions. The future regime should allow

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\(^{73}\) These might be specified by the regulator or meet criteria set by the regulator.

\(^{74}\) Directive 2003/41/EC on the activities and supervision of institutions for occupational retirement provision.

\(^{75}\) CEIOPS-DOC-03/05, available on CEIOPS’ website www.ceiops.org.
for review of the factors of the MCR formula.

9.116 CEIOPS suggests that the Solvency I requirements could be used to calculate the MCR for a set transitional period to smooth the introduction of Solvency II. It is suggested that the Commission is asked to review the MCR after this period to find a standard that is possibly better aligned to the objectives set out by the Commission and CEIOPS. A transitional period that could only end when a replacement formula had been agreed would not be acceptable to CEIOPS.

9.117 Regarding the transitional period, CEIOPS proposes to apply the following concept as a starting point:

- For a transitional period of up to three years CEIOPS suggests that the MCR should be based on the existing Solvency I requirements to smooth the introduction of Solvency II and to ensure continuity with the current capital requirements.

- CEIOPS recommends calibrating the MCR during the transitional period such that, on average, the demand on an insurance undertaking is comparable to the level of a specified percentage (e.g. 50%) of the solvency requirement under the current solvency system. This may require some recalibration of its components, as changes in the valuation of assets and liabilities would also need to be reflected to achieve this goal. The future regime should allow for a review of the second floor for internal models.

- For internal models, CEIOPS suggests that a second floor of the form $MCR \times j$ (with a factor $j \geq 1$) should apply during the transitional period. The factor $j$ could be calibrated (using QIS) such that, on average, the floor is comparable to the level of e.g. 100% of the solvency requirement under the current regime.

The practical implications of the two approaches described above should be tested under QIS, including the extent to which they meet the design criteria in para. 9.114.

9.118 CEIOPS is considering a number of alternatives for the revised MCR (after the transitional period):

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76 Other than that part of unit-linked life business where the policyholder bears the investment risk.

77 A minority of CEIOPS members support an approach based only on principles.

78 Whilst excess holdings would therefore be deemed to have no value for the purposes of covering technical provisions or capital requirements, such a formulation of limits would stop short of requiring a firm to divest itself of the excess holdings, if it could demonstrate that it had sufficient assets (within the limits) to cover its technical provisions and its capital requirement.

79 At least one member holds the view that a subsidiary exposed to insurance risk should not be an exception to the rule. Other CEIOPS members note the similarities with the current Directives.

80 Including, for with-profits and unit-linked business, any undertakings or commitments given to the insured.
• a calculation based on the existing Solvency I requirements (in the case of the non-life formula, possibly with some amendments to make the formula more suitable for interim calculations);

• a MCR determined as a margin over liabilities; or

• a simple calculation based on the standard formula of the SCR.

Combinations of these alternatives might also be viable – for example, using the higher of the Solvency I requirements and a margin over liabilities.

9.119 Whichever approach is chosen, further analysis is needed to decide whether to include an allowance for investment risk in the MCR.

9.120 As a working hypothesis, CEIOPS will develop a simple factor-based formula for the MCR by simplifying the SCR, possibly by retaining its most significant items, by using a more straightforward technique for aggregation and by calibrating the factors to a lower level of confidence. For QIS purposes, CEIOPS suggests testing this and the Solvency I formulae (to test what level of prudence they deliver, given the changes to technical provisions). Further consideration is necessary to determine whether these approaches would meet the design criteria in para. 9.114.

9.121 Further analysis and testing is necessary to decide whether there is a need for specific measures in Pillar I and/or Pillar II to address those cases where the result suggested by the SCR calculation falls below, or is very close to the MCR.

Eligible assets covering technical provisions, the MCR and the SCR

Purpose

9.122 Assets covering technical provisions, the MCR and the SCR should secure the safety, yield and marketability of the undertaking’s investments.

9.123 The assets covering the MCR and SCR have overall the same purpose as assets covering technical provisions. CEIOPS suggests that in principle, the same eligibility criteria and the same classes of eligible assets should be applied for the coverage of the technical provisions, the MCR and the SCR, unless field testing showed that availability of eligible cover for the capital requirements would cause a difficulty.

9.124 CEIOPS suggests applying the same eligibility criteria and the same classes of eligible assets regardless of whether the standard SCR formula or an internal model is used.

List versus principles

9.125 CEIOPS suggests a future regulation based on a combination of overall
eligibility criteria, or principles, and/or a list of eligible asset classes. In a combined approach, to be eligible, an asset must be both listed as eligible and meet the principles. One possible way to achieve this is to determine principles at the directive level, whereas a list of potentially eligible asset classes could be specified in implementing measures.

9.126 The list of eligible asset classes should be mainly positive (i.e. any asset that is listed is potentially eligible; everything else is not). The list should be easy to apply and update. The principles used to construct the list should be clear and concise.

**Principles for eligible assets**

9.127 Future IAIS standards on assets covering technical provisions should be considered as a starting point for determining asset eligibility.

9.128 The following principles for asset eligibility are presented as a starting point for further elaboration:

- an asset portfolio is acceptable only if and to the extent that the assets can be realised before the liabilities need to be met. That is, the assets covering the technical provisions and the capital requirement should be able to generate an expected net cash flow (asset income less liability outgo) that is always positive;

- in order for an asset to be admissible its value needs to be ascertainable; and

- intangibles should be excluded.

9.129 CEIOPS will need to consider the practicability of these principles and whether additional requirements would be necessary. It is envisaged that currently eligible asset classes should be compatible with any principles that are developed. But a new approach to asset eligibility should enable greater flexibility for supervisors to recognise innovative asset types.

**List of eligible asset classes**

9.130 CEIOPS advises using the current list of eligible asset classes as a starting point.

9.131 One precondition of extending the list with a new asset class is the possibility of a risk charge in the SCR standard formula to address the risks of that class.

9.132 CEIOPS suggests that the updating procedure for revising the list is kept as simple as possible, in order to secure a list that reflects current financial markets and does not unnecessarily restrain innovation.

9.133 Further analysis is needed to decide what conditions should be placed on derivatives to be included as eligible assets.
Limits on concentrations in covering assets and diversification requirements

Purpose

9.134 CEIOPS anticipates that in the future regime the risks related to investments will be covered primarily by the SCR. However, quantitative rules should complement the SCR in order to reduce risks which cannot be quantified under the SCR calculation, can be considered only partially or could only be quantified at the cost of undue complexity. In particular, CEIOPS suggests considering quantitative limits to address concentration and liquidity risks.

9.135 In addition, as a complementary safety net to prevent insurers from following imprudent strategies, and also to facilitate smooth transition to the new framework, CEIOPS is considering a set of quantitative limits based on the limits defined by the current Directives. These limits may also relate to types of risks that are in principle covered by the SCR, since the SCR (as any mechanistic capital requirement) will not always be able to assess those risks properly.

9.136 CEIOPS suggests, in principle, to apply the same quantitative limits to assets covering the technical provisions, the MCR and the SCR, regardless of whether the standard formula or an internal model is used; unless field testing showed that availability of assets within these limits would cause a difficulty in meeting capital requirements.

Quantitative limits

9.137 CEIOPS considers that the starting point for quantitative limits on investments could be the existing limits defined by the current Directives. These could include 'hard' limits such that the portion of any asset holding which exceeds the limit is not permitted to cover the technical provisions, the MCR or the SCR.78

9.138 CEIOPS is also considering additional types of limits in Solvency II to increase flexibility. Such limits could take the form of:

- a 'softer' variant of the first type of limit, where excess holdings may be recognised partially for the purposes of covering technical provisions, the MCR or the SCR;

- 'prior approval' limits: breaches of such limits are allowed with prior consent of the supervisory authority. For the prior approval limits, clear qualitative conditions should be set in Pillar II to define circumstances where a breach of such limits could be accepted.

9.139 Further analysis is needed to assess whether using these additional types of limits may be more appropriate for certain types of asset classes than 'hard' limits. However, the introduction of additional types
should not lead to undue complexity. CEIOPS notes that the supervisory review process could also be used (with appropriate level 3 guidance) to judge whether adequate asset diversification had been achieved.

9.140 CEIOPS suggests that, in combination, concentration limits and capital requirements should at least seek to prevent the potential for an insurer’s assets to fall below its liabilities as the result of significant exposures to individual counterparties. CEIOPS considers a rule that the total exposure of the insurer to any single counterparty or group of closely related counterparties (such as all the companies in a group) should not exceed a proportion of the insurer’s available capital (single counterparty restriction) – e.g. 25% or 50%. The exposure is the amount by which the insurer’s capital would fall if the counterparty became insolvent and could not meet any part of its liabilities. It includes indirect exposure arising from the effect on the value of other investments. The practicalities of this approach would need to be considered further.

9.141 In practice, some exceptions to the single counterparty restriction – or, in the case of limits, different proportions of available capital - could be considered, for example:

- exposure to subsidiaries, if on a look through basis, the assets and liabilities of the subsidiary are consolidated with the assets and liabilities of its parent and the single counterparty restriction is then applied to the resulting total assets and liabilities;  

- government bonds, and other loans to governments or guaranteed by them;

- short term bank deposits; and

- reinsurance, on the grounds of practicality given concentrations in the reinsurance market – although some CEIOPS members do not consider that such an exception would be justified.

9.142 Having regard to the expected cash flow of the liabilities and that liquidity risk is difficult to measure, the portfolio should also be selected in such a way, that the liquidity risk is adequately managed. CEIOPS is considering requirements on insurers to have sufficient liquid assets to cover the expected outgo (claims and expenses) over a set period of time.

**Qualitative Requirements on the Management of Assets and Liabilities**

*Qualitative investment rules*

9.143 The insurer must take into account the volatility of investments covering technical provisions, the SCR and MCR.

9.144 The level of security, quality, liquidity and profitability of investments
should take into account the time horizon of the technical provisions covered and the necessity of the limitation of the liquidity risk. Portfolio selection should be governed by the following principles:

- the assets shall be chosen in accordance with the contractual obligations (e.g. endowment policies vs. term assurance) entered into with policyholders. In the case of a potential conflict of interest, the insurance undertaking should ensure that the investment is made in the sole interest of the policyholders and the beneficiaries;

- investment in assets which are not admitted to trading on a regulated financial market must be kept to prudent levels;

- adequate asset-liability management;

- adequate diversification and dispersion of investments, avoiding excessive reliance on any single asset, issuer, group of undertakings business sector or geographical area and accumulations of risk in the portfolio as a whole;

- limitation to prudent levels of investments which are less liquid;

- efficiency and cost control

**Definition of the investment strategy on all assets**

9.145 The investment strategy shall be drawn up in writing and approved by the Board of Directors and is subject to internal control. It shall clearly identify:

- the strategic allocations (the determination of the asset allocation, including ALM considerations - i.e. asset mix across the main investment categories);

- the return to be targeted and the way in which insurers exercise their discretion with regard to with-profits life business;

- the allocation limits by counterparty, business sector, geography, type of instrument and currency;

- the use of financial derivatives as part of the general portfolio management process or of structured products that have the economic effect of derivatives and securities lending;

- the liquidity approach, including a liquidity contingency plan and liquidity stress testing;

- the admitted investments and any restrictions imposed on the investment policy;

- the methodology, benchmarks and frequency of performance measurement and analysis.
- the degree of sensitivity to investment risks, including matching, risk margins, capital requirements; the results of the use of quantitative tools in previous years (e.g. stress tests and/or scenarios) shall also be reflected in the investment policy;

- the extent to which the holding of some types of assets is ruled out or restricted where, for example, the sale of the asset could be difficult due to the illiquidity of the market or where independent (i.e. external) verification of pricing is not available;

- key staff involved in investment activities;

- the framework for reporting on asset positions;

- the nature of any outsourcing and requirements for the safekeeping of assets (custodial arrangements);

- the strategies on the use of voting rights owned; and

- how to proceed internally when new asset classes or financial derivatives become part of the investment portfolio.

9.146 Notwithstanding the prudential rules that might be set, Senior Management of an insurer shall define an investment policy, based on rules and procedures that a wise, prudent and expert manager would apply in order to pursue the investment strategy (see para. 9.145), as set by the Board of Directors, in line with the interests of the insured and to obtain an income appropriate to the incurred risk and liabilities covered. Along with the investment policy, an asset-liability policy shall be drawn up, describing how financial and insurance risks will be managed in an asset-liability framework both short and long term.

9.147 An asset-liability policy shall be formulated by the Senior Management and approved by the Board of Directors. It shall clearly identify:

- the structure of the asset-liability approach, including the time horizon;

- the stress tests to be performed, including the identification of parameters;

- the connection between the asset-liability policy and the investment policy and their interaction

- all areas where the insurance undertaking is committed to pay bonuses to the policyholders.

9.148 The use of derivatives and structured products that have the economic effect of derivatives and securities lending shall be set by the Board of Directors, along with the investment policy and shall clearly identify:

- goals and strategies of the use of derivatives;

- principles of risk management using derivatives;
- types of derivatives contracts that are admitted (with limits), together with those that are prohibited or restricted.

9.149 The ALM policy should enable the undertaking to:
- manage actively the gap between assets and liabilities according to the business objectives;
- Reevaluate the underwriting and investment strategies.

9.150 The Board of Directors shall assess the adequacy of the investment and asset liability policies at least annually, and when market or business conditions change significantly.

**Implementation of the policy**

9.151 The investment and asset-liability policies shall be implemented in accordance with the procedures established in the investment plan. The investment plan shall define the procedures of implementation and control.

9.152 The investment plan shall clearly identify:
- the way in which the investment policy shall be implemented namely, how the credit and liquidity risk mitigation policy is implemented;
- how investment management interacts with overall risk management and internal control of the undertaking;
- how market, credit, operational and liquidity risk mitigation policy is implemented.

9.153 The procedures must:
- identify the chain of responsibilities;
- define the process of approval, implementation and monitoring of investment decisions;
- define the frequency and format of internal reporting.

9.154 The investment plan shall ensure that the investment policy:
- applies appropriate know-how and avoids any conflicts of interests;
- is monitored by persons other than those responsible for the implementation.

9.155 Insurers shall maintain adequate internal control procedures, e.g. management information systems, to monitor the exposure to different types of investments risk.
9.156 The senior management shall reassess the investment plan and the adequacy of the procedures on an annual basis, or more often when appropriate.

9.157 The procedures adopted to implement and monitor the investment policy shall be available for scrutiny by the supervisory authority.

9.158 The procedures adopted to implement and monitor the investment policy shall be audited by an auditor.

9.159 Any deviations from the investment policy (and the resulting exposure) shall be reported internally and, whenever materially relevant, shall be communicated to the Board of Directors. Depending on the circumstances, the deviation should be corrected or the policy amended by the Board. Deviations should also be reported to the supervisory authority if they materially affect the financial position of the undertaking, and a description of the measures that the insurance undertaking proposes to implement in order to resolve any detected situation and prevent future occurrences should be included.

*Unit-Linked (including index-linked)*

9.160 In addition to the above, the investment policy (in line with footnote to para. 9.146), in the case of unit linked business, should be in accordance with the contractual obligations and the matching of assets and liabilities (See also para. 9.145).
Extract from the Call for Advice:

The Commission would invite CEIOPS to give technical advice on ... appropriate EU standards for calculating the SCR. The advice should involve the following areas:

- formulation of a detailed risk classification building on the work of the IAA
- operational risk...

- the most relevant modelling approaches for different risks in the standard formula should be analysed (...). The proposed modelling approach should take into account the possibility of partial internal models.

- When aggregating different risks, their dependencies should be carefully analysed to decide how, and to what extent, correlation effects should be taken into account. ...

- Estimation of other parameters should also be analysed in detail:
  - which benchmarks and indexes could be used to define the parameters
  - which estimation periods should be chosen
  - how to address time-varying aspects (...) and to which extent these could be taken into account in Pillar II (...)
  - should expert judgement be used when setting the parameters or should they be solely based on statistical inference
  - in which areas and to what extend would parameters need to be calibrated to national markets in order
  - how often should the parameters be updated and how

- risk measure and calibration:
  - probability of ruin (...), with suitable skewness adjustments where necessary, may be preferred in the standard formula.
  - the principle could be to use a 1 year observation period although longer alternatives should also be studied (cf. also solvency control levels)
  - different ruin probabilities ...
- going-concern aspects of business should be analysed and incorporated into the model where feasible (...), or taken into account through Pillar II measures

- whenever possible, appropriate simulations and field-testing should be performed to support the EU decision making process. ...

The main concern regarding the implementation of Solvency II regime for SMEs is the potential complexity. This aspect has to be taken into account both when developing quantitative measures and when formulating supervisory requirements for insurance companies. ...

Background

10.1 An Article for the definition of the SCR (N9 for "target capital" in document MARKT/2539/03) has to be developed. The following example outlines some possibilities for illustration and discussion purposes. It is tentative by nature and particularly the issues in square brackets require further analysis and consideration.

"To be able to absorb significant losses and to give [reasonable] assurance to policyholders, an insurance undertaking shall hold at all times solvency capital which is adequate having regard to its overall risk profile. Solvency capital requirement shall cover the relevant [underwriting, credit, market, liquidity, operational and other] risks. It shall be calibrated so that the probability of failure of an undertaking within [one] year is sufficiently low ["1/200" or “as defined in implementing measures”].

Explanatory text

Purpose of the SCR

10.2 The SCR should deliver a level of capital that enables an insurance undertaking to absorb significant unforeseen losses over a specified time horizon and gives reasonable assurance to policyholders that payments will be made as they fall due.

10.3 The concept of SCR shares many features with economic capital in value-based management. Commercially, an undertaking will define its risk appetite and, where applicable, the public rating it wishes to achieve. It then determines the economic capital that will be necessary to limit its probability of insolvency to a defined level.
A quantitative solvency assessment could be based on a simplified balance sheet, consisting of assets, liabilities and available capital (the excess of assets over liabilities). Changes in the level of available capital will depend on the risks to which an undertaking is exposed over the time horizon of the solvency assessment. Because the future development of assets and liabilities is unknown, the future level of available capital will behave stochastically. It may be described by a probability distribution, which measures the likelihood of all possible outcomes.

A 'risk measure' is, in general terms, a function that assigns an amount of capital to a risk distribution. Commonly used risk measures are Value at Risk (VaR) and Tail Value at Risk (TailVaR). VaR assesses the probability of ruin at a specified quantile (e.g. 99.5%). By contrast, TailVaR considers both the probability and the severity of losses in the event that specified quantile is breached.

On a fundamental level, TailVaR would encourage supervisors, undertakings and policyholders to consider the consequences of a potential default, rather than focussing simply on the probability of insolvency. To some extent, a comparison could be drawn with the advanced approach to credit risk in the banking sector, where undertakings consider both the Probability of Default (PD) and the Loss Given Default (LGD).

In many business lines, insurance undertakings may be subject to infrequent, high-impact losses (i.e. catastrophic losses). The risk distribution will feature a 'fatter tail' than the normal distribution. Because TailVaR reflects these losses, it creates an incentive for insurance undertakings to improve their identification, management, monitoring and control of low-frequency, high-severity risks.

The concept of 'coherence' has been introduced in actuarial literature to describe risk measures that possess a desirable set of consistency
features. TailVaR is an example of a coherent risk measure. One desirable feature is 'subadditivity', which means the aggregation of risks does not lead to an increase in overall risk. VaR, by contrast, does not enjoy this property, except in the case of normally-distributed risks. For these reasons, TailVaR is the risk measure that the IAA Insurer Solvency Assessment Working Party has suggested to use for the purpose of setting solvency requirements.

While the standard formula would be calibrated to simulate the effects of a particular risk measure, undertakings operating under this approach would not be expected to perform a VaR or TailVaR calculation themselves. The effects could be simulated using a pre-specified, formulaic calculation. Internal models could deliver requirements that are closer to an undertaking’s 'true' VaR/TailVaR result.

The most significant disadvantage associated with TailVaR is the scarcity of data, which could lead to increased modelling error. A formula based on TailVaR might be difficult to generalise in such a way as to provide a good fit for the majority of insurance undertakings (i.e. the standard formula would over- or under-estimate capital requirements in many cases because it would be calibrated using tail data that may not be representative).

Following changes to the Framework for Consultation, CEIOPS notes that the Commission Services are proposing the use of VaR as a general principle for calculating the SCR. For internal models, the Commission Services acknowledge in CfA 11 that more advanced modelling techniques could be used, including the use of TailVaR as a risk measure. CEIOPS would stress the importance of a common underlying philosophy for the SCR, applicable to both the standard formula and internal models. Using different risk measures would impact the incentives to move from the standard formula to internal models and would lead to unpredictable results in the context of partial models. Since internal models strive for a more accurate mapping of the business and therefore are more likely to address also the consequences of tail events, the use of TailVaR would smooth the transition from the standard formula to internal models and facilitate partial use.

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83 Subadditivity means that $\rho(A + B) \leq \rho(A) + \rho(B)$, where \( \rho \) is a risk measure and \( A, B \) represent any two portfolios.

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Confidence level

10.12 The level of prudence, or confidence, for the SCR will be used to calibrate the standard formula. It may also be a required design feature of internal models. The choice of such a level of confidence will have to reflect the overall prudential objectives of Pillar I requirements on insurers.

10.13 The impact of the chosen confidence level will need to be assessed using quantitative analysis. Capital requirements are unlikely to increase in a linear manner as the confidence level is raised. Raising the absolute level of the survival ratio from 99.5% to 99.9% could potentially lead to a much greater marginal increase in capital requirements than a move from 95% to 99.5%.

10.14 Choosing to calibrate the SCR to a defined ruin probability will not necessarily lead to smooth or predictable results. For example, a confidence level of 99.5% (i.e. a ruin probability of 0.5%) does not imply that a ruin event will occur once in every 200 years, or that, on an annual basis, 1 in every 200 undertakings will fail. The causes of ruin in one undertaking may have a wider impact, leading to clusters of insurer failures.

Time horizon

10.15 The time horizon for the SCR should reflect:
- the frequency with which results are produced;
- the ability of undertakings to take timely and effective management action; and
- the ability of supervisors to respond to a breach of the requirement.

Given periodic reporting cycles, it seems sensible that, generally, a time horizon of one year should be applied to the SCR calculation. However, CEIOPS notes that a longer time horizon or a degree of variation within the time horizon might be necessary to enable any formula or internal model to describe more realistically how quickly the insurer or its supervisor would be able to react.

Unacceptable level of capital

10.16 The unacceptable level capital is the 'ruin' situation that the SCR is designed to 'avoid' (to, e.g., a 99.5% confidence level). Traditionally, ruin might be characterised as the point at which assets no longer exceed liabilities. However, an undertaking's liabilities may extend beyond the one-year time horizon for the SCR. At the end of the time horizon (and the beginning of the new one), assets may still exceed liabilities, but capital could represent a much lower confidence level.
10.17 The SCR should also reflect the capital required at the end of the time horizon to properly address the run-off of an undertaking's liabilities. This does not mean that available capital should be sufficient to cover the full run-off period of the liabilities. But the liabilities should be transferable to a third party at the end of the time horizon, or policyholders should have reasonable assurance that their claims would be covered.

10.18 The risk margin in technical provisions provides a reasonable proxy for these aims. The SCR should therefore deliver the amount of capital necessary to ensure, with a 99.5% confidence level, that assets will exceed technical provisions (and other liabilities) as estimated over the period to the end of the specified time horizon.

**Going concern vs. run-off / winding up assumptions**

10.19 The purpose of regulatory capital requirements for solvency purposes is twofold. On the one hand, it aims at ensuring that the insurer is sufficiently capitalised during the defined time horizon as a going concern. On the other, regulatory capital should also provide for a successful run-off of an insurance undertaking in a ruin situation. Therefore, regulatory capital has aspects of both the going-concern and run-off situations.

10.20 Over the one-year time horizon, new business may change the risk profile of an insurance undertaking. As the undertaking should be regarded as a going concern until an insolvency event, capital requirements should generally reflect new business. Additional legal considerations should be studied, especially for those Member States where law requires precise and clear definitions for imposing higher individual solvency requirements to address projections of future business.

10.21 In a ruin situation, the issue of costs specifically linked with the run-off of the insurers’ business arises. However, to some extent, it could be argued that some costs associated with run-off are already reflected in technical provisions. Other run-off costs might be addressed when determining the level of confidence in the SCR calculation.

10.22 CEIOPS notes that the valuation principles for assets and liabilities underlying the calculation of the SCR should be compatible with IFRS to the greatest possible extent.
**Risk classification**

10.23 To the extent possible, Pillar I quantitative requirements should be designed to address the main financial risks to which an insurance undertaking is exposed. As a general principle, a Pillar I treatment may be applied to any risk which is susceptible to quantification or limitation. However, risks may be excluded from an explicit requirement in Pillar I if, for example:

- on average, the risk is considered marginal;
- simplifying assumptions can be made; or
- a standardised risk treatment would not be practicable.

By contrast, Pillar II should consider all risks, even if they cannot be quantified. The relative emphasis on Pillar II requirements in the solvency framework will depend on the adequacy of Pillar I treatments.

10.24 It should be noted that there is no unique way of breaking down risks into categories. A categorisation that provides a good fit to the risk profile of one undertaking may be less appropriate in other circumstances. This will depend largely on the nature, scale and complexity of the business undertaken by an individual undertaking. In addition, the practicability criterion means that some subcategories of risk could be treated in a Pillar I internal model, but not a Pillar I standardised formula.

10.25 Based on the work of the IAA, the risks faced by a typical insurance undertaking could be categorised under five major headings:

- **underwriting risk**: specific insurance risk arising from the underwriting of insurance contracts, associated with both the perils covered and the processes followed in the conduct of the business;
- **market risk**: risk arising from the level or volatility of the market prices of financial instruments;
- **credit risk**: the risk of default and change in the credit quality of the issuers of securities, counterparties (notably reinsurers) and intermediaries to whom an undertaking has an exposure;
- **operational risk**: risk of loss resulting from inadequate or failed internal processes, people, systems or from external events;
- **liquidity risk**: exposure to loss in the event that insufficient liquid assets will be available to meet the cash flow requirements of policyholder obligations as they fall due, or the assets may only be realised under excessive costs.

In view of ongoing work by the Joint Forum, liquidity risk has been added as a separate risk category.
The risk of asset liability mismatch is also significant, particularly in life insurance business. ALM risk can manifest itself through all of these risk categories and therefore its quantifiable aspects should be addressed as part of the SCR. But it is important that capital requirements are supported by an appropriate framework for assessing asset liability management under Pillar II.

 Dependencies between risks will also require close consideration. The Sharma report noted that risk dependencies can be part of a 'causal chain' of events leading to the failure of an undertaking. In addition, concentrations of risk, both within and across these categories, demand special attention. These themes are considered later in this answer.

**Operational risk**

Operational risk is defined as the danger of losses resulting from inadequate or failed internal processes, people and systems, or from external events. Such risks are difficult to classify and to quantify. Furthermore, sound risk management by undertakings might be expected to identify and overcome any weaknesses in internal processes. This might suggest operational risk is predominantly a Pillar II issue, where the emphasis should be on testing the sufficiency of an undertaking's internal processes.

In the banking sector, similar difficulties regarding the classification and quantification of operational risk have been acknowledged. But regulatory capital requirements have been developed to encourage improved measurement and understanding of operational risk. For similar reasons (and to avoid regulatory arbitrage), operational risk should be subject to a Pillar I treatment under Solvency II.

**Asset Liability Management (ALM)**

The goal of an ALM system is to manage business development over a period with the aim of ensuring the right balance between assets and liabilities. ALM should form an integral part of the business of the overall risk management of an undertaking, supporting the definition of business strategies, product design, pricing, valuation and investment functions. It should address all relevant risks and should reflect assumptions regarding policyholder behaviour and management actions. ALM therefore encompasses Pillar I and Pillar II elements.

In the context of Pillar I, the focus should be on quantifying the effects of any mismatch between assets and liabilities over the time horizon of the solvency assessment. Due to the long-term nature of life contracts, the duration of liabilities sometimes greatly exceeds the average duration of assets. Significant mismatches can also occur in non-life business, although liabilities are typically of a much shorter duration. In general, though, asset-liability mismatches can increase sensitivity to changes in the term structure of interest rates. Consequently, Pillar I capital requirements should take into account the duration mismatch when measuring interest rate risk. A duration mismatch may also
impact market and credit risk (e.g. when changes in assets values are connected to with-profit insurance contracts).

10.32 Pillar II should cover all aspects of ALM systems that lie outside the scope of quantification in the SCR standard formula and cannot be addressed by economic capital. For example:

- the duration gap between assets and liabilities needs to be managed actively according to an undertaking’s business objectives;
- assumptions on the modelling of macro-economic conditions, assets, liabilities, policyholder behaviour and management actions need to be plausible and consistent with management strategies;
- ALM systems should be closely integrated with the process of defining business strategies.

**Liquidity risk**

10.33 ALM coordinates the cash flows on the asset and liability side of the balance sheet and thus proves to be an effective tool for reducing liquidity risk in both life and non-life insurance. For a large portfolio of life business, cash flows should be reasonably predictable on a one year time horizon because of the law of large numbers.

10.34 Effective liquidity planning should address most sources of liquidity risk and can be tested under Pillar II. Other sources of liquidity risk may be considered implicitly under Pillar I through the assessment of other risk categories. For example, in life business, an increase in lapse rates could be assessed through its impact on an undertaking’s market and underwriting risk exposures.

**Methodology for developing the standard formula**

10.35 The SCR will play a central role in ensuring that insurance undertakings hold financial resources commensurate with the risks to which they are exposed. However, to be an effective tool, a standardised, transparent and well-understood method for calculating the SCR is necessary.

10.36 The calculation of the SCR by a standard formula should be technically feasible for all insurance undertakings. But it should be recognised that no standard formula would be capable of delivering a good measure of economic capital requirements in every case. In this respect, the availability of internal models and appropriate Pillar II responses (where an undertaking is unable to develop an adequate model) will be important safeguards.

10.37 As requested by CfA 10, CEIOPS has considered various modelling approaches for the risk categories under the SCR standard formula.
Naturally, the practical implications of these approaches (or any others) will require further consideration to assess:

- the relationship between the amount of capital held currently and that suggested by the standard formula;
- the ease of calculation and the costs resulting from the accumulation of the necessary data; and
- the robustness and reliability of the standard formula in meeting the stated objectives for the SCR, taking parameter and model error into account.

10.38 The robustness and reliability of the formula will depend, to a great extent, on the methodology used in its construction. One method would be to consider each risk in isolation, develop an appropriate modelling treatment\(^{86}\) and arrive at a risk capital component. However, a 'bottom-up' approach of this kind would be subject to two main difficulties:

- ensuring that the risks selected are the most significant drivers of balance sheet development; and
- combining the different capital components into an overall requirement without over- or understating the overall amount of risk, which requires a good understanding of risk dependencies.

10.39 An alternative approach would be to produce a model a generic insurance undertaking in an attempt to identify the sources of randomness which influence the development of the balance sheet. The operating result is expressed in terms of cash flows which are then broken down into independent, explanatory variables.

10.40 In principle, a 'top-down' method of this kind offers two significant benefits:

- by starting from a global analysis, it does not pre-judge which risks have the most impact on the development of the business; and
- risks are considered dynamically rather than in isolation (i.e. the interaction between different risks is a fundamental part of the analysis).

However, the practical difficulties of this method are clear, not least the problem of defining a 'generic' EEA insurance undertaking. Transforming a set of explanatory variables into a simple, transparent formula would also be a non-trivial exercise.

10.41 The top-down method would involve complex modelling and then difficult approximations to enable the results to be calculated in a

\(^{86}\) For example, by considering a hypothetical insurance undertaking that is subject only to that particular risk.
reasonably simple manner. It would not naturally include the results of scenario analyses, although these could be incorporated at the expense of greater complexity. However, the approach could be quite rigorous, and the effect of approximations and uncertainties could be analysed in some detail.

10.42 The bottom-up method is simpler in principle, but it may be difficult to combine different risks in anything more than an ad hoc manner. As a result, it could be more difficult to understand the weaknesses of the resulting formula. Important sources of risks may not be reflected in the constituent parts of the standard formula, skewing the overall result. In addition, it is not always possible (or sensible) to consider risks in isolation.

10.43 In practice, the two methodologies should be seen as complementary rather than contradictory, and both should be used in the development of the standard formula.

Modelling approaches to the main risk categories

Risk dependencies

10.44 Generally, CEIOPS may assume that not all risks will occur at the same time. Due to diversification effects, the overall capital requirement might be smaller than the sum of the capital components for the individual risks. Simple addition of the components could therefore overstate the appropriate amount of capital.

10.45 A commonly used mathematical tool to analyse risk dependencies is linear correlation. Linear correlation is based on the assumption of linear dependency between risks and has the advantage of familiarity, as well as being relatively easy to compute. However, its effectiveness is limited, particularly as insurance risks are not generally subject to a normal distribution. For risks that follow a heavily-skewed distribution, or for risks where the dependency relationship is non-linear, a linear correlation assumption may underestimate capital requirements. In addition, normally uncorrelated risks may become highly correlated in extreme circumstances.

10.46 Notwithstanding its theoretical deficiencies, linear correlation, together with a simplified form of tail correlation, may provide a starting point (and practical expedient) for the standard formula. However, it would be important to keep note of any dependencies that would not be addressed properly by this treatment.

10.47 An important associated question is the degree of granularity in the analysis. Breaking down risks into many categories and then assuming independence may underestimate the capital needs if, in reality, some of the categories turn out to be positively correlated. Conversely, using

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87 See Embrechts, McNeil, Straumann, *Correlation and Dependency in Risk Management: Properties and Pitfalls*,
too few categories will result in requirements that are insensitive to the different risks posed by lines of business with very different characteristics.

10.48 In principle, an adequate overall capital requirement should reflect the underlying distributions of the individual risks, rather than just the resulting capital components. In practice, this is likely to require approximation, using reasonable assumptions about the underlying distributions and correlations.

**Underwriting risk in life-insurance**

10.49 Underwriting risk is the specific insurance risk arising from insurance contracts. These risks are based on the technicalities of the insurance business: the insurance undertaking has to ensure future payment commitments, and the volume of such payments must be calculated in advance.

10.50 A distinction can be drawn between:

- **mortality risk**: relates to the unexpected mortality experience;
- **lapse risk**: relates to an unanticipated rate of policy lapses, terminations or surrenders;
- **expense risk**: arises from the variation in the expenses associated with the insurance contracts;
- **morbidity risk**: is not included in this answer and will need further consideration; and
- **disability risk**: is not included in this answer and will need further consideration.

10.51 In considering either form of underwriting risk, the valuation principles underlying the relevant technical provisions need to be well understood. Capital requirements should address the risk that these provisions will prove deficient.

10.52 In general, underwriting risk stems from four risk sources:

- **volatility**: because of the stochastic nature of mortality, policy lapses and expenses, the actual future cash flows will fluctuate around their statistical mean value;
- **catastrophe**: beyond 'normal' random fluctuations (volatility) in mortality, policy lapses and expenses, extreme events may result in high positive deviations from the statistical mean value;
- **level uncertainty**: caused by misestimating the assumptions for all future years;
• **trend uncertainty**: arises from the difficulty in accurately assessing the future direction of assumptions (e.g. rising life expectancy) in future years.

10.53 When a policy lapses, the insurer pays the surrender value and 'receives' the technical provision that is released by the policy's termination. Therefore, the treatment of lapse risk in the SCR strongly depends on how lapses are dealt with in evaluating technical provisions. If when valuing liabilities, surrender floors are considered on a contract-by-contract basis, then an increase in lapse rates presents no additional risk. If not, the insurer is at risk of higher lapse rates if surrender values are higher than policy technical provisions. But lower lapse rates may also be unfavourable to the insurer if surrender values are lower than technical provisions of those particular contracts and lapse assumptions are included in the calculation of technical provisions on a portfolio basis.

10.54 Unanticipated lapse rates may also prevent an insurer from recovering initial policy acquisition expenses from future premiums. Acquisition expenses may be recognized implicitly in financial statements through the use of modified net level premium valuation methods. But such implicit methods do not currently include any provision for unfavourable variations in lapse rates. Under a 'best estimate + risk margin' valuation approach, unfavourable variations should be partly included in the risk margin unless this risk is excluded from the valuation of technical provisions.

- **Choice of structure for modelling approach to underwriting risk**

10.55 A scenario-based modelling approach to underwriting risk would require the definition of a set of scenarios that adequately describe any adverse development of the underwriting result of the insurers’ portfolio. Given the heterogeneity of underwriting risk, even within established 'classes' of insurance business, relying solely on such an approach does not seem feasible in the context of the standard formula.

10.56 However, by nature of their construction, factor-based models may be less able to predict extreme, catastrophic events, which may constitute an important source of risk in life insurance. This may also be the case for lapse risk since the impact on the technical provisions of a higher or lower than expected lapse rate may not be constant in time. The impact of this kind of events on the risk situation of the insurer may be better captured by stress and scenario techniques than by static factor-based models.
- Choice of volume measures

10.57 With regards to mortality risk, depending on the product design, two natural candidates for a volume measure appear to be the technical provision, if the risk of longevity is relevant, and the capital at risk for term insurance at the beginning of the solvency assessment time horizon.

10.58 A detailed understanding of the insurer’s expense structure and expense drivers is a key element when determining the expense risk. Using a prospective valuation approach of assets and liabilities means that all possible future cash flows will have to be identified and valued. Expenses that will have to be made in future to service an insurance contract are one of those cash flows for which a provision will have to be calculated.

10.59 Usually all future administrative costs and consequent commissions would need to be considered. Where future deposits or premiums are factors in the determination of the liabilities, expenses related to the deposits or premiums would usually be taken into consideration. In addition, where appropriate, the expenses of administering investments normally would be taken into consideration too.

10.60 For the assessment of lapse risk a pre-specified stress test can easily be applied. The capital requirement is of the form of the difference between a special valuation of policy liabilities and the normal valuation. For the special valuation, the lapse assumption is multiplied by a specified factor greater or less than one. For some policies, an increase in lapse rates will result in an increase in policy liabilities, while, for others, liabilities will increase when assumed lapses fall. As an example, in Canada, lapse rates increase for policies in the first class and reduce for those in the second class. An appropriate change assumption might need to reflect the effects of product and market variations (e.g., the level of interest rates or the extent to which surrender options, viewed as embedded financial options, go deeper in /out of the money) and portfolio effects, such as the duration of the contract.

10.61 A lapse case, which cannot be addressed in a factor-based approach are those products for which lapse risk does not act uniformly over the products’ life, such as lapses at early durations which may reduce the undertaking’s exposure to later risks for some policies and not for others.
- **Aggregation**

10.62 Mortality, lapse and expense risk may be analysed on the basis of homogenous segments of the portfolio to take the particularities of the single segments into account. Such a segmented approach to underwriting risk would present the problem of how to aggregate individual risk charges. Simply adding up the individual charges would neglect diversification effects between different homogenous risk groups. This may lead to an overestimation of the required risk capital.

10.63 Two potential approaches to deal with this problem for further consideration are:

- determining mortality (or lapse/expense) risk capital charges for each segment and calculate the overall mortality (or lapse/expense) risk capital charge using capital aggregation methods; or

- determining only the first two moments of the distribution of the mortality (or lapse/expense) risk for each segment and calculate the first two moments of the overall mortality (or lapse/expense) risk using a correlation matrix for the second moments. Assuming the overall mortality (or lapse/expense) risk to have a specific two-parametric probability distribution, one may then calculate the overall mortality (or lapse/expense) risk capital charge.

10.64 The Dutch Financial Assessment Framework\(^{88}\) and the IAA, for example, follows the first approach. The advantage of this approach is that for the calculation of the capital charges of the single segments the underlying probability distribution of the risk can be chosen according to the particularities of the segment. The disadvantage of this approach is that a standardised aggregation of the risk capital charges of the segments may cause certain problems. To be in a position to aggregate them in a mathematically precise manner, the complete dependence structure of the risks has to be known. This is rarely the case.

10.65 According to the second alternative, it is not necessary for the supervisor to set a probability distribution for the risk on the level of the individual segment. This may help to reduce the model error of the determination of the risk capital, since the moments of the risks can be aggregated precisely once the linear correlations between those risks are known. Moreover, it may be easier to make an adequate assumption on the type of the distribution on the level of the diversified overall risk than on the level of the segment risk. On the other hand, this approach takes only the first two moments of the probability distribution on the segment level into account.

Underwriting risk in non-life insurance

- Definition and main sub-risks

10.66 Underwriting risk is the specific insurance risk arising from insurance contracts. These risks are based on the technicalities of the insurance business: the insurance undertaking has to ensure future payment commitments, and the volume of such payments must be calculated in advance.

10.67 A distinction can be drawn between:

- **reserve risk:** relating to existing claims on coverage already provided; and

- **premium risk:** relating to future claims arising from existing contracts and from renewals and new business during the time horizon

10.68 Reserve risk stems from two sources: on the one hand, the absolute level of the technical provisions may fail to reflect the true expected value of total losses and may therefore consistently underestimate total claim volumes. Alternatively, because of the stochastic nature of future claim payouts, the actual claims will fluctuate around their statistical mean value. The need to address both sources depends on the valuation principles underlying the technical provisions. For example, under a best estimate approach, CEIOPS would implicitly assume that the first source of risk had been addressed (although clearly the potential for estimation error arising from the uncertainties in the valuation would still need to be considered). The level of reserve risk should reduce as uncertainties are eliminated and information about the claims and their ultimate settlement costs become known.

10.69 Premium risk is understood to relate to future claims arising during and after the time horizon for the solvency assessment. Premium risk is present at the time the policy is issued, and before any insured events will have happened. The risk is that the volume of incurred losses for these claims (comprising both losses paid during the time horizon and provisions made at its end) plus expenses is higher than the premiums received. In assessing premium risk, both renewals and new business during the time horizon should be incorporated.

- Choice of structure for modelling approach to underwriting risk

10.70 A scenario-based modelling approach to underwriting risk would require the definition of a set of scenarios that adequately describe any adverse development of the underwriting result of the insurers’ portfolio. Given the heterogeneity of underwriting risk, even within established 'classes' of insurance business, the exclusive application of such an approach does not seem feasible in the context of the standard formula.

10.71 However, by nature of their construction, factor-based models may be less able to predict extreme, catastrophic events, which constitute an
important source of risk in non-life insurance. The impact of this kind of events on the risk situation of the insurer may be better captured by stress and scenario techniques than by static factor-based models.

- **Factor-based approach to premium and reserve risk**

10.72 Considering the split between premium and reserve risk, and the different nature of these two subrisks, it seems advisable to choose two volume measures for underwriting risk, i.e., one measure specific to premium risk and one measure specific to reserve risk.

10.73 With regard to reserve risk, a natural choice for a volume measure is the provision for claims outstanding (PCO) at the beginning of the solvency assessment time horizon. The valuation of the PCO in this context should be compatible with the rules on the calculation of the technical provisions to be developed as part of the future solvency framework (cf. Cfa 8 – technical provisions in non-life insurance).

10.74 As regards premium risk, premiums, or premium related provisions, might be chosen as a volume measure. Although conceptually it would be appropriate to use an estimate of the earned premiums during the solvency time horizon, such a measure lacks objectivity and may be too easy to manipulate. The earned premiums of last year might be more appropriate. Alternatively, the premium provisions (comprising both the provision for unearned premiums and unexpired risk) at the beginning of the time horizon might be chosen. However, such an approach may not adequately reflect new business during the time horizon.

10.75 The choice of coefficients within a factor-based model for underwriting risk needs to reflect the use of a limited (one year) time horizon, but with full allowance for changes in the expectation over that period of claims to be provisioned for at the end of that period. It is to be based on an analysis of the insurers’ underwriting result during the time horizon; a loss of capital occurs if the underwriting result is negative.

10.76 Since the level of adequacy in the premiums tends to differ between insurers, it seems advisable to use an undertaking-specific parameter. This could for example be achieved by estimating the expected value of the combined ratio of the insurer by using the historical ratios. Historical ratios may not reflect the latest information on rate changes, terms and conditions or characteristics of the underlying risks. This would require attention as part of the SRP.

10.77 By contrast, a completely undertaking-specific determination of the volatility of the combined ratio would make a high requirement on the insurer. It would require the insurer to observe the volatility of the relevant business for a long period of time and to make an actuarial analysis on those data. This approach may not seem feasible for the standard formula.

10.78 The opposite approach would be to set a uniform assumption for the volatility of the combined ratio of a business line for all companies. It would not take into account the differences between the insurers in the
volatility of their combined ratios. In particular, the standard formula would not differentiate between the volatility of large and of small portfolios.

10.79 The choice of factors for reserve risk needs to consider the volatility of the insurance undertaking’s run-off result. Requiring insurance undertakings to estimate this volatility for each individual portfolio would be demanding in terms of expertise, and may prove too ambitious for the standard formula.

10.80 As a practical alternative, portfolio-specific reserve risk could be measured using a combination of portfolio-specific and market data. For example, the volatility of the run-off result may be estimated by a function that depends on the size of an individual undertaking’s portfolio. Components of the formula could also take account of the rate of growth of the undertaking. This could be combined with a uniform assumption on the volatility of the distribution applicable to the respective business line.

- Scenario techniques as a supplement to factor-based approaches

10.81 A factor-based approach to measuring underwriting risk is based on certain probabilistic assumptions on the frequency and severity of claims. Typically, CEIOPS chooses a parametric family of distributions to model the future occurrence of loss. Parameters are fitted to statistical data that is collected from historical experience. The major part of such claims experience relates to 'normal' circumstances, where a certain regularity and smoothness in claims patterns may be observed. Extreme or irregular events may either be absent from the data, or may have to be 'smoothed out' in the calibration process. By nature of their construction, factor-based models may be less able to predict extreme, catastrophic events.

10.82 One response to this issue might be the provision of a separate treatment for catastrophic underwriting risk. Scenarios may be used to model extreme events where the assumptions of the analytic model break down, or to take into account risks that are not covered by analytic models – particularly systemic risk. Mixing two different techniques may actually reduce modelling risk associated with a standard formula.

10.83 Possible scenarios include

- meteorological events (storms, hails, floods, other weather extremes);
- geological events (earthquake, volcanic eruption, meteorite collision);
- major industrial accidents (for example, explosions, oil energy accidents);
- terrorist attacks;
• actuarial reassessments (for example, inadequate provisions arising from asbestosis claims); and

• reinsurer default.

A more restricted range might be applied to take account of relative data availability. For example, CEIOPS might include periodic natural catastrophes, but exclude extreme, episodic events, such as terrorist activity.

**Market risk**

10.84 Market risk arises from the level or volatility of market prices of financial instruments. Exposure to market risk is measured by the impact of movements in the level of financial variables such as stock prices, interest rates, real estate prices and exchange rates. Main sub-risks include interest rate risk, equity and property risk, currency risk and concentration risk.

10.85 Adequate measurement of market risk assumes the availability of market-consistent valuations. Market values of financial instruments (including derivatives) are generally available from listings in the various securities markets. Because of the lack of liquid markets of life insurance liabilities, what is to be understood by the market value of liabilities may be approximated by fair value techniques, but needs further analysis coordinated with CfAs 7 and 8 on technical provisions and IASB. In particular for life insurers, embedded options and the option of the life insurance undertaking to adjust profit sharing, may impact market values of liabilities. Furthermore, changes in market conditions may influence policyholders’ behaviour, thus changing market values of liabilities.

10.86 Market risks may be addressed through stress tests. Stress tests are defined as shock-based changes in risk factors, reflected in a change of available capital: for example, a fall in the interest rate by a certain factor. The stress is applied to simulate changes in the level of available capital. This simulated change in the capital is equal to the capital charge for that risk. For example, if the capital declines by €1m when a 40% reduction in equity prices is simulated, the capital charge for equity risk should be €1m.

10.87 The stresses themselves should be fixed in the regulation. Further analysis will be necessary to determine whether the standard formula should rely on a harmonised set of market parameters (assuming a well-diversified European or worldwide portfolio) or whether (in an objective manner) allowance could be given for specific characteristics of national markets.

10.88 For companies with a material non-linear market risk exposure a single pre-specified stress test will better reflect the actual market risk inherent in the exposure. A pre-specified stress test may increase the complexity of the calculation for those insurers and supervisors may have to dedicate more resources to verify those results. However, for
those insurers this possible increase in complexity may already be there when determining the valuation of these non-linear instruments (depending on CfAs 7 and 8).

10.89 A factor-based approach could be viewed as a practical alternative to a pre-specified stress test. This could follow a 'hybrid approach', where the factors are be calibrated by running stress tests (on, for example, a series of hypothetical insurance undertakings), or by using data from QIS. For linear risks, the resulting factor-based model would replicate the effects of a pre-specified stress test. For non-linear risks, a factor-based model might be seen as a reasonable approximation for a stress test. The quality of approximation may be increased by adding additional risk factors. For example, convexity captures non-linear effects in interest rate risk which are not covered by duration.

10.90 Although the quality of the approximation may be increased by adding further risk factors, the need for the standard formula to be easy to implement and verify will place a limit on its complexity. This means there will be cases where the approximation delivered by a factor-based model differs significantly from the results that would be generated by stress tests. This may arise where an undertaking has more material (or substantially different) non-linear effects, due to different features embedded with their products or investments. In such circumstances an internal model may give a better reflection of an undertaking’s individual risk profile than the factor-based model.

Credit risk

10.91 Credit risk is the risk of loss of value resulting from default and change in creditworthiness of issuers of securities within the investment portfolio, counterparties (through, for example, reinsurance or derivative contracts) and intermediaries to whom the insurance undertaking has exposure, and any other risks normally reflected in credit spreads. It is therefore also the loss of value arising from deterioration in the market's perception of counterparty or issuer's creditworthiness.

10.92 Credit risk may also impact the value of technical provisions, for example in the case of with-profits contracts in life insurance.

10.93 Concentration in credit risk may arise through the combination of different business activities. For example, an insurer might hold bonds of a reinsurer and have a significant reinsurance exposure to the same counterparty.

10.94 Within the range of possible modelling approaches for credit risk a pre-specified stress test may allow features such as undertaking-specific reinsurance and hedging effects to be taken into account. However, a pre-specified stress test may increase the complexity of calculation.

10.95 A pre-specified stress test can be approximated by a factor-based model reflecting the linear elements of credit risk. This may be a reasonable approximation for undertakings with non-material credit
risk exposures. Subsequently, non-linear and reinsurance exposures can be assessed through supplementary methods – for example, by applying one or more simple stress tests.

10.96 As credit risk includes the loss of value arising from deterioration in the market's perception of counterparty or issuer's creditworthiness, the financial position’s market value (or marking to model when no market value exists) may be a natural choice as volume measure for credit risk. However, further consideration would be necessary to avoid 'double counting' credit risk effects that may have already been captured in the market risk assessment.

10.97 Different sources of information might be used for the calibration of the factors applicable to credit risk. The use of external ratings can introduce a number of practical difficulties concerning recognition and comparability, together with the treatment of unrated exposures. In the CRD context, banking supervisors are required to recognise individual ratings agencies and map their output onto standard credit quality steps. CEIOPS could draw upon experience in the banking sector (and the expertise of CEBS) if it concluded that external ratings should play a role in Solvency II.

10.98 Credit spreads might also be used to reflect the market's perception of credit quality. Higher credit spreads are historically more volatile and therefore should result in a higher capital requirement. Although also credit spreads may not be available for every exposure an undertaking should be able to produce a reasonable proxy for the credit spread (marking to model value).

10.99 CEIOPS would not envisage that insurers should develop, within the context of the standard formula, credit rating models along the lines of the CRD. However, the Internal Rating Based Approach (using generalised assumptions about the input parameters) might be used to calibrate the SCR standard formula.

10.100 If the chosen approach assumes well diversified portfolios, then supplementary treatments would be necessary for risk concentrations. This might take the form of a pre-specified stress test, which determines the effect of a certain event on the value of the available capital.

**Operational risk**

10.101 Operational risk is defined as the danger of losses resulting from inadequate or failed internal processes, people and systems, or from external events. Internal failures include management incompetence, fraud, criminal intentions and errors in systems and processes.

10.102 A scenario-based modelling approach to operational risk would require the definition of a set of scenarios that adequately describe the internal and external events which constitute operational risk. Given the heterogeneity of these events, the application of such an approach does not seem feasible in the context of the standard formula.
A factor-based model may be less able to reflect the causes and predict the impact of the extreme events associated with operational risk in insurance. But in view of the secondary importance of operational risk compared to market and credit risk and the current lack of reliable actuarial data it may offer an appropriate and adequately simple structure for the standard formula.

For a Solvency II standardised treatment of operational risk, the factor-based structure of the banking approach could be retained. This would require the determination of one or several volume measures (as a proxy for the scale of an insurance undertaking’s operations, and therefore the likely scale of operational risk exposure) and of a fixed factor or a range of fixed factors in different business lines.

A possible choice of a volume measure would be gross premiums (to reflect current business activities) or technical provisions (to reflect business in force thus also covering run-off situations). As regards gross premiums, it could further be envisaged to measure their level not only for one year, but to take an average over several years. However, this more backwards looking approach might lead to problems with fast growing companies or in case of modifications to the business plan, the operational risk being however particularly important in these types of circumstances.

Different factors might be chosen for distinct business lines. To what extent operational risk exposure should vary between different business classes requires further analysis.

Policy on solvency capital

CEIOPS is aware that Solvency II is going to be a risk-sensitive approach. In consequence it is important to require undertakings to develop and carry out active concrete policies specially focused on the definition, follow-up and control of their solvency position. This is equally valid for undertakings using a standard formula as well as internal models. With regards to groups and ‘solo’ undertakings which are part of a group, it is expected that there will be a policy on solvency capital in place at the group level, which would also elaborate on the solvency capital needs of the constituent parts of the group.

However, the calculation/calibration of the SCR, despite being more risk sensitive than the present method, may still not adequately capture all of the risks that an insurer faces. In particular, it may not be sufficiently forward-looking and take into account the business strategy, shareholder expectations, or economic environmental risks. To mitigate any supervisory concerns over the adequacy of the future SCR, supervisory authorities would then review the insurance undertaking’s policy on solvency capital and adjust the SCR requirement where the insurance undertaking’s policy appears deficient or exposes risks not captured in the SCR.

However, it would be important for supervisory authorities to take into account the fact that an insurance undertaking’s capital policy may not
be driven by regulatory objectives. There may be other motives for the undertaking to aim for a given level of capital higher than the SCR (i.e. rating). The undertaking may target higher levels of capital to reflect differing risk-appetites and shareholder expectations rather than policyholder protection. The SCR, of course, represents a regulatory capital standard below which insurers are not expected to fall. If an insurer wishes to maintain a higher credit rating than which is necessary to meet the SCR then that is its own affair.

10.110 As already stated in the answer to the CfA 1 on risk management\(^89\), insurance undertakings are generally required to have in place strategies for solvency capital and all material risks to which they are exposed (such as underwriting, credit, market, liquidity, operational risks), as well as an appropriate policy for the use of reinsurance and other risk mitigation techniques that together manage and address overall solvency\(^90\).

Pillar II review of capital adequacy

10.111 As a working definition for Pillar II purposes:

The supervisory authority must assess the risk profile of the undertaking in order to evaluate the level of the adequacy of the solvency capital requirement. If the supervisory authority concludes that the solvency capital requirement does not match the risk profile of the undertaking, either because there are risks that are not captured by the Pillar I calculation or because they are captured insufficiently, it should be able to require the undertaking to hold more capital against its existing risks. The supervisory authority is also able to require the undertaking to hold more capital if after the supervisory review process it reaches the conclusion that the qualitative requirements on governance, internal control, risk management, market conduct, or any other, are not adequate for the insurance company business, or for their nature and scale. This would result in an adjusted SCR until the insurance undertaking has complied with supervisory demands. The obligation to hold more capital (add-on) does not indemnify the insurance undertaking from finding a remedy for the deficiencies within a reasonable timeframe.

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89 CEIOPS-DOC-03/05, available on CEIOPS’ website: [www.ceiops.org](http://www.ceiops.org).

90 A comparable general approach could be found, for example in the CRD, Article 123:

“Credit institutions shall have in place sound, effective and complete strategies and processes to assess and maintain on an ongoing basis the amounts, types and distribution of internal capital that they consider adequate to cover the nature, scale and level of risks to which they are or might be exposed.

These strategies and processes shall be subject to regular internal review to ensure that they remain comprehensive and proportionate to the nature, scale and complexity of the activities of the credit institution concerned.”
Assessing whether the capital requirements generated for an individual insurer by the standard formula are sufficient to address its individual risk profile (including the qualitative requirements) is unlikely to be an exact science and not comparable to the deep analysis of an internal model.

For example, it may be difficult to state (with any accuracy) that any particular insurer’s capital requirement is consistent with an overall confidence level of, say, 95%. However, the individual risk profile of the insurer can be assessed, as part of a qualitative test, against the design criteria underlying the standard formula.

The outcome of the supervisory review of the insurer’s risk profile and management practices and the estimate of capital adequacy could result in a three step approach. In a first step, the supervisory authority should ensure that the real risks faced by the insurance undertaking are not underestimated. The real risks could be underestimated due to the following causes:

- Risks incurred by the insurance undertaking are not captured or captured insufficiently by the Pillar I calculation.
- The insurance undertaking presents deficiencies and failures in the systems or other risks, including in the internal control and/or risk management systems, or in the governance and market conduct qualitative requirements.

Therefore the outcome must be that CEIOPS develops a standard SCR formula that is sufficiently sophisticated to deliver a reasonably accurate (judged against the desired safety confidence level) capital requirement for the vast majority of insurers in the scope of application. In this way, it could be ensured that a Pillar II adjustment of the Pillar I SCR estimate would only rarely be needed; for example, this may be the case for insurance companies that are niche players, and for which the product and liability maturity assumptions in the standard SCR formula may not be sufficiently sensitive.

If the risks are underestimated due to the first cause, in a second step, the supervisory authority should require a higher level of solvency capital requirement to be calculated by the insurance undertaking, by using an internal model or adjustments to the standard formula which are to be approved by the supervisory authority.

If the risks are underestimated due to the second cause the supervisory authority should, in a second step, report its summary of deficiencies and failures, and demand that the undertaking remedies the situation within an agreed timeframe. If the undertaking is not able to adapt its economic situation and processes to fit its real risk profile within the agreed timeframe, the supervisory authority should, in a third step, specify a level of capital that the insurer should hold in order to meet regulatory concerns until the insurance undertaking has complied with supervisory demands. This may be a different level of capital (or a different quality of capital) from that calculated by the
insurer using the SCR formula or by full or partial models approved for use in the SCR calculation. The obligation to hold more capital (add-on) does not indemnify the insurance undertaking from finding a remedy for the deficiencies within a reasonable timeframe.

10.117 The reasons why the adjusted SCR may differ from the SCR are as follows:

- The SCR formula may not adequately capture all of the risks that the insurer faces. Despite attempts to make the SCR more risk-sensitive than the MCR, it may not be possible to tailor the calculations to account for every eventuality.

- Particular risks may exist that are not dealt with adequately under the Pillar I SCR – for instance, the results of possible longer-term perspectives on capital adequacy (for instance the continuity test), or any elements of counter-cyclical capital which cannot be captured by the SCR (Pillar I) and will be addressed in more detail in its answer to the CfA 22 on procyclicality. The treatment of such risks is still an open issue and there has not yet been taken a decision on which way these risks should be dealt with.

10.118 In spite of the proposed measures and reasons in paras. 10.114 – 10.115, CEIOPS is aware that in practice, limited reliance should be placed on supplementary capital requirements in Pillar II. For example, the use of Pillar II to bring individual insurers closer to the target confidence level by adjusting the Pillar I estimate of the SCR would require intensive use of supervisory resources. There is also a risk that supplementary requirements under Pillar II would not be applied consistently, giving rise to competitive distortions and uncertainty for insurers. Similarly, internal models will not always be a viable solution because of the development costs, particularly in the case of smaller insurers as the costs are not likely to be fully proportional.

10.119 Nevertheless where adjustments need to be made to the SCR in a more judgemental way at the discretion of the supervisory authority (with or without the agreement of the insurer) and typically arising from the second cause, then this new level of capital is to be referred to as the ‘adjusted SCR’ or SCR following the Pillar II review performed by the supervisory authority. Since the basic assumption for the calculation of the SCR is an undertaking that is well run; as a consequence the adjusted SCR would then be greater than the Pillar I SCR.

CEIOPS’ Advice

General purpose of the SCR

10.120 CEIOPS supports the inclusion of a specific article in the Framework Directive that defines the purpose of the SCR.

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91 CEIOPS-CP-06/05, available on CEIOPS’ website: www.ceiops.org.
The SCR should deliver a level of capital that enables an insurance undertaking to absorb significant unforeseen losses and gives reasonable assurance to policyholders that payments will be made as they fall due. It should reflect the amount of capital required to meet all obligations over a specified time horizon to a defined confidence level. In doing so, the SCR should limit the risk that the level of available capital deteriorates to an unacceptable level at any time during the specified time horizon. The SCR should take into account all significant, quantifiable risks.

The same objectives should apply, regardless of whether the SCR is calculated using the standard formula, partial internal models or full internal models. The standard formula, as with any mechanistic formula, can only represent an approximation of an undertaking’s true risk profile. But the formula must be a reasonable reflection of the overall risk to which an undertaking is exposed, and appropriate incentives should be provided to encourage insurance undertakings to better manage their risks.

Articulation of the SCR

CEIOPS strongly appreciates TailVaR for supervisory purposes and a risk sensitive measurement. From a technical and economic point of view, the concept of TailVaR may seem appropriate to assess the risk profile. But depending on the risk characteristics of the portfolio, VaR may be calibrated to deliver approximately the same degree of prudence as the concept of TailVaR. To avoid undue complexity, the standard formula should simulate the effects of a given risk measure, without requiring insurance undertakings to perform a VaR or TailVaR calculation for their SCR.

CEIOPS recommends that the SCR is calibrated using the same risk measure under both the standard formula and internal models.

The unacceptable level of capital which serves as a benchmark for the calculation of the SCR should be defined as the point where assets no longer exceed technical provisions (valued with a prudential risk margin) and other liabilities. Even if the capital covering the SCR has been used up at some time during the specified time horizon, the risk margin in technical provisions should ensure that the portfolio could still be transferred to a third party.

The choice of the level of confidence to which the SCR is calibrated (and the resulting industry capital requirements) will have to reflect the overall prudential objectives for pillar I requirements on insurers (the desired level of safety). QIS will be necessary to assess the effects of these proposals. As a working hypothesis, CEIOPS will

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92 One CEIOPS member holds the view that a definition of ruin under the SCR should also incorporate the MCR.

93 The reporting classes defined in the accounting Directive 91/674/EC.

94 CEIOPS-CP-06/05, available on CEIOPS’ website: www.ceiops.org.
consider how the SCR might be calibrated with a 99.5% confidence level. However, it would be worthwhile to test a range of different confidence levels (for example, 99.9%) to understand the sensitivity of the proposed SCR. The range to be considered could be expressed in a manner broadly consistent with, for example, secure financial strength ratings.

10.127 As a working hypothesis, the SCR should be based on a time horizon of one year. This should generally include an allowance for risks arising from continuing business activities within that time horizon. However, a longer time horizon could also be considered for some longer-tail risks.

10.128 As a working hypothesis, CEIOPS notes that assets may generally be accounted for at their market value for the SCR calculation. In cases where there is no readily-available market value, an alternative approach should be adopted, but this should still be consistent with any relevant market information. For tradable assets, this should be an estimate of the realisable value.

10.129 As regards technical provisions, their valuation for the purposes of calculating the SCR should be compatible with the rules on the calculation of the technical provisions to be developed as part of the future solvency framework (cf. CfAs 7 and 8 on technical provisions).

Risk classification

10.130 The SCR standard formula should include practical treatments for all material, quantifiable risks to which an insurance undertaking is exposed. The materiality of risks should be assessed within QIS. By contrast, Pillar II should cover all risks.

10.131 The IAA risk classification should be seen as the starting point. At a minimum, the SCR standard formula should address underwriting, market, credit and operational risks. SCR internal models may adopt a more granular risk classification.

10.132 As the IAA report notes, insurance undertakings may lack sufficient data for an experience-based operational risk requirement. But a standardised Pillar I requirement for operational risk (with the option of graduating to a modelling approach) may provide incentives for insurance undertakings to improve the identification, measurement, monitoring and control of this risk. CEIOPS therefore advises to include quantification of operational risks in Pillar I and underlines the importance of Pillar II to assess the risk management of operational risks and to determine an appropriate supervisory response.

10.133 Quantifiable aspects of liquidity risks (such as, for life business, an increase in lapse rates) may be considered as part of other risk categories under Pillar I. Remaining aspects of liquidity risk should be addressed in Pillar II.

10.134 The SCR standard formula should consider any ALM mismatch
whenever its effects on the risk categories can be quantified. All other aspects of ALM systems and their role in risk management are left to supervisory attention in Pillar II.

10.135 Pillar II should verify the plausibility of the assumptions underlying an ALM system. It should check whether the ALM system is properly integrated with an undertaking's overall risk management and is used in the process of defining business strategies.

Methodology for developing the standard formula

10.136 The modelling approaches described below provide an outline of possible risk treatments under a 'bottom-up' methodology. The advice given reflects a set of working hypotheses that will be used to develop a standard formula for testing under QIS.

10.137 In parallel, CEIOPS will perform 'top-down' analysis to test the adequacy of its working hypotheses. The analysis will check that material risk drivers are not overlooked. It will also consider implicit assumptions that underlie the way in which risk capital components are aggregated into an overall requirement.

Modelling approaches to the main risk categories

Risk dependencies

10.138 Further analysis is required to assess whether linear correlation, together with a simplified form of tail correlation, may be a suitable technique to aggregate capital requirements for different risks.

10.139 However, if the concept of linear correlation were to be adopted within the standard formula, it would be important

- to keep note of any dependencies that would not be addressed properly by this treatment;
- to choose the correlation coefficients to adequately reflect potential dependencies in the tail of the distributions;
- to assess the stability of any correlation assumptions under stress conditions;
- to take account of the type of risk measure that is used to determine the SCR; and
- to provide statistical evidence that diversification effects exist even for the tail-end events, and that such effects are not systematically underestimated by an approach based on linear correlation.

In this context, it may be necessary to incorporate a cushion for model
error in the calibration of the formula.

**Underwriting risk in life insurance**

10.140 CEIOPS recommends testing a multiple-factor based approach to model underwriting risk as the base model, supplemented with simple scenario techniques.

10.141 The factor-based model should address mortality risk and expense risk. Lapse risk might be captured either by an additional risk factor, or by a pre-specified stress test. CEIOPS recommends testing these two alternatives in QIS. However, CEIOPS notes that lapse risk needs to be addressed in the SCR only to the extent that it is not already captured by the treatment of surrender floors in technical provisions.

10.142 With regards to mortality risk, a natural choice for a volume measure, subject to further analysis, might be the technical provision at the beginning of the solvency assessment time horizon in cases where the risk of longevity is relevant, and the capital at risk at the beginning of the solvency assessment time horizon in cases where an increase in the mortality rate is relevant.

10.143 Using a prospective valuation approach of assets and liabilities means that all possible future cash flows will have to be identified and valued. Expenses that will have to be made in future to service an insurance contract are one of those cash flows for which a provision will have to be calculated. This provision might be a natural choice as a volume measure for expense risk.

10.144 Lapse risk could be assessed by determining the impact of an appropriate change in lapse rates (for example doubling and reducing by one-half).

10.145 An assessment of underwriting risk requires underlying data that are sufficiently homogeneous with respect to emergence, development and statistical pattern of claims. Therefore the insurers’ book of business will need to be segmented into homogeneous risk classes.

10.146 The risk capital charges for each segment might be determined individually, before suitable aggregation methods are applied to arrive at an overall risk capital charge. Alternatively, the overall risk capital charge might be determined from assumptions on the type of the distribution on the level of the diversified overall risk rather than on the level of the segment risk. Such an approach would take only the first two moments of the probability distribution from the segment level into account. CEIOPS recommends testing both alternatives in QIS.

**Underwriting risk in non-life insurance**

10.147 CEIOPS recommends testing a factor-based approach to model underwriting risk as the base model, supplemented with simple
scenario techniques to take account of the impact of low-frequency, high-impact events. The treatment of underwriting risk could be based on the analysis of the insurers’ underwriting result during the SCR time horizon.

10.148 Within a factor-based approach, a natural choice for a volume measure, if underwriting risk is split up in premium risk and reserve risk, might be premiums and technical provisions respectively.

10.149 To the extent practicable, the coefficients in a factor-based approach should permit a limited degree of using undertaking-specific information to take account of the divergence of the risk profiles of individual insurers. To ensure comparability of results, this procedure would have to be performed in a mechanical and non-discretionary way. Further actuarial analysis is required to determine possible approaches.

10.150 The level of premium risk might be reflected in the insurers’ combined ratio (excluding the claims provisions run-off result). The choice of factors for premium risk should reflect both the absolute level of the combined ratio (i.e., the adequacy of premiums), as well as its volatility. The absolute level of the combined ratio would generally need to be estimated by using undertaking-specific data, in order to take account of the profitability of the individual insurers’ business. To determine the volatility of the combined ratio, a mixture of undertaking-specific data and data which is set by supervisors might be used.

10.151 The level of reserve risk might be reflected in the claims provisions run-off results, assuming that the claims provisions are consistently valued in line with the general rules on the valuation of technical provisions within the solvency framework. Whereas it does not seem appropriate, within the context of the standard formula, to completely determine the mean value and the volatility of the run-off results using undertaking-specific data, the determination of the coefficients might use a mixture of undertaking-specific data and data which is set by supervisors to derive these parameters.

10.152 An assessment of underwriting risk requires underlying data that are sufficiently homogeneous with respect to emergence, development and statistical pattern of claims. Therefore the insurers’ book of business will need to be segmented into homogeneous risk classes.

10.153 The ongoing relevance of the present EU classification of lines of business as a basis for segmentation requires further consideration with stakeholders. A standard classification that is more closely aligned with actual behaviour of the insurance undertaking should have positive consequences for risk management. The appropriate segmentation should be considered as part of QIS.

10.154 Other types of non-life insurance apart from property/casualty may require different modelling techniques. In the case of health insurance contracts with features similar to long-term life insurance, the
treatment of underwriting risk might follow that for life insurance.

10.155 In Annex D, CEIOPS has set out a first indication of how the approach outlined above may be adapted to incorporate an allowance for the effect of reinsurance.

**Market risk**

10.156 In view of the importance of ALM in the overall risk management, assets and liabilities should be considered simultaneously whenever movements in market prices affect both of them. In this ALM perspective, the main components of market risk should be addressed, namely interest rate risk, equity risk, property risk and currency risk.

10.157 An adequate theoretical basis for measuring market risk might be pre-specified stress tests / what-if analyses. However, CEIOPS notes that such an approach may lead to practical difficulties, particularly with regard to the verification of the results. CEIOPS will test pre-specified stress tests and a factor-based approximation in QIS before deciding how market risk should be reflected in the standard formula. Clearly, the treatment of risk mitigation/financial hedging techniques will require further consideration.

10.158 Within an assessment of market risk, the valuation of technical liabilities should be compatible with the rules on the technical provisions to be developed as part of the future solvency framework (cf. CfAs 7 and 8 on technical provisions). In life insurance, embedded options and the insurance undertaking’s discretion to adjust profit sharing should be taken into account.

**Credit risk**

10.159 CEIOPS recommends testing a factor-based approach to model credit risk as the base model, with appropriate supplements for concentrated exposures.

10.160 CEIOPS notes two valuable sources of data input for determining the factors that should be applied to credit risk: ratings and credit spreads (reflecting the markets’ perception of creditworthiness). The volume measure should be based on market value of the credit risk exposure (or marking to model when no market value exists).

10.161 For a factor based approach, CEIOPS notes the general principle that using more information should result in a capital requirement that is more closely aligned to the undertaking's risk profile. However, there is a trade-off between the increase in the formula's complexity and the accuracy of the measurement. For QIS, CEIOPS will test:

- an approach using both credit spreads and ratings information;
- simplified approaches using just credit spread information, or
just ratings information; and

- the materiality of different types of credit risk exposure, including exposures to reinsurance counterparties and intermediaries.

### Operational risk

10.162 For a standardised treatment of operational risk, CEIOPS recommends testing a multiple factor-based approach. The volume measure should be an adequate proxy for the scale of an insurance undertaking's operations, and therefore the likely scale of operational risk exposure. Possible choices would be the level of gross premiums and/or technical provisions.

### Policy on solvency capital

10.163 CEIOPS supports the inclusion of more specific high-level principles on a 'Policy on solvency capital' as part of the risk management in the future Framework Directive.

10.164 Insurance undertakings should be required to have a Policy on solvency capital which should contain the following elements:

- Insurance undertakings must define the level of Solvency Capital above which they wish to operate in order to achieve their goals.

- Insurers must also define the composition of the Solvency Capital, e.g. pure capital, hybrid tools. The CEIOPS answer to CfA 1994 has to be taken into account.

- The methods used to derive the capital goals. For instance, the realistic adverse scenarios which the insurer has considered and that have identified the capital level in line with the capital goals.

- The methods and internal organisation used to monitor performance against the goals about solvency capital.

- The procedures to be applied in order to evaluate the impact on solvency capital (consumption of capital) of significant activities of the insurer. A sufficient level of confidence must be ensured so that neither any new activity (new products, new investments, etc.) nor a negative development of existing activities, will endanger the rights of the policyholders and beneficiaries.

- Undertakings have to ensure that any modification of any element of available capital (including the contribution of insurer’s subsidiaries to available capital) is consistent with their policy and solvency capital, in order to control and avoid having a failure in the compliance of the SCR, or own goals on solvency capital, if higher than the SCR.
<table>
<thead>
<tr>
<th>10.165</th>
<th>CEIOPS is aware that the way of arriving at the actual SCR for the individual undertaking is a consequence of 'policy on solvency capital'.</th>
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<tbody>
<tr>
<td>10.166</td>
<td>The adequacy of the insurer's policy on solvency capital should be assessed by supervisory authorities using Pillar II supervisory powers as described in CEIOPS’ Answer to CfA 14.</td>
</tr>
<tr>
<td>10.167</td>
<td>An add-on measure, materialised in a requirement of an 'adjusted SCR', may be envisaged as part of Pillar II measures, to be applied on insurance undertakings with a deficient 'policy on solvency capital'. Legal considerations should be studied, especially for those Member States where regulations require precise and clear definitions for creating higher individual solvency requirements. Having in mind the legal environment in these countries, a list of situations and actions to apply add-on measures under Pillar II may be desirable as part of level 2 or level 3 implementing measures.</td>
</tr>
<tr>
<td>10.168</td>
<td>When risks are not captured or captured insufficiently by the Pillar I calculation an 'adjusted SCR' may also be envisaged as part of Pillar II measures.</td>
</tr>
<tr>
<td>10.169</td>
<td>However, where a supervisory authority concludes that the insurer has deficiencies and failures in the systems and controls (including in internal control and/or risk management, or in the governance and market conduct qualitative requirements) of a nature and scale that fall below minimum standards and where financial loss may result, CEIOPS advises, that it may adjust the SCR to reflect this increased risk while these deficiencies are being rectified.</td>
</tr>
<tr>
<td>10.170</td>
<td>CEIOPS clearly recognises that the imposition of an adjustment in these circumstances is not a means of solving the issue, which must be addressed via other supervisory tools, but of covering the additional risk in the meantime. However, supervisory authorities together with the insurance undertakings must ensure that in an agreed time frame the insurance undertaking remedies the causes for their additional risks, so that the adjustment can be diminished afterwards.</td>
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Call for Advice No. 11

Solvency capital requirement: internal models (life and non-life) and their validation

Extract from the Call for Advice:

The scope of this Call for advice is broad. The issues can be classified in three different areas (with different expertise requirements) as follows:

1. From a management point of view: integration of the internal model and internal processes, including management, business planning, investment, actuarial, underwriting, risk management, etc., processes, as well as the inter-linkage and communication between these processes.

2. From an information technology point of view: the use of sound methods (e.g. project management), technical platform (e.g. software, interfaces), databases, documentation, testing etc.

3. From an actuarial point of view: mathematical modelling of risks and parameter estimation, including:

   - appropriate, documented and tested mathematical, statistical, financial, economics and simulation models and methods
   - statistically tested parameters and analysis of data (including robustness and sensitivity analysis)
   - in a going-concern approach assumptions (balance sheet and profit and loss items including risk-sharing features for the next year) should be in-line with the forecasts used internally in the company (budget etc.)

The Commission Services would like CEIOPS to give technical advice on appropriate EU standards for calculating the SCR by an internal model and on the compliance criteria for model validation and approval by the supervisor.

Background

11.1 An article on internal models and their approval (N10-N11 in document (MARKT/2539/03) could be developed along the following lines:

“The solvency capital requirement may be calculated by an undertaking’s own internal model after validation and approval by the competent authorities. The risk measure, the time horizon and the
Explanatory text

Supervisory aims with regard to internal models

11.2 The SCR standard formula will be designed to deliver, on average, capital requirements that are broadly consistent with the overall prudential objectives for Solvency II. However, any rule-based standard formula that is harmonized at the European level will only provide a good representation of the risks faced by 'typical' undertakings. In other cases, it will not fully deliver the SCR’s objectives\(^95\) - particularly for innovative undertakings in the future.

11.3 Internal models can be used to represent the business of an individual undertaking more closely, resulting in capital requirements that are better aligned to the undertaking's risk profile.

11.4 Within the overarching purposes of the SCR (paras. 10.2 and 10.3), internal models provide greater flexibility than the standard formula. This means flexibility for the national supervisor to take the models of well-managed undertakings as a basis for Pillar I capital requirements, as an alternative to a standard formula framework that, inevitably, cannot be updated as frequently. In turn, undertakings have the flexibility to continually upgrade their internal models as financial markets and technologies evolve. Policyholder protection benefits, both from the supervisor’s ability to better assess the risk profile of the undertaking and the undertaking’s ability to better manage its risks.

11.5 It is useful to decompose any regulatory system\(^96\) into

- **information gathering**: how the supervisor collects information;
- **standard setting**: what behaviour is considered acceptable; and
- **behaviour modification**: what actions are taken by the supervisor to enforce acceptable behaviour.

Internal models are not about any fundamental loosening of control (behaviour modification) or any redefinition of acceptable behaviour. Internal models are about giving the supervisor more flexibility in the information gathering and thereby more variety in taking corrective action. Internal models provide an alternative measure against which to verify acceptable behaviour.

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\(^95\) See paras. 10.121 and 10.121.

Costs and Benefits

11.6 It should be noted that the maintenance of internal models and their supervision will require considerable resources. It is therefore necessary to discuss potential costs and benefits for undertakings and their supervisors.

11.7 CEIOPS recognises that the process of building and applying internal models can deliver substantial benefits:

- internal (economic) risk measurement and regulatory risk measurement methodology converge, preserving the ability of undertakings to innovate and maintain their competitiveness;
- non-linear contracts (e.g., derivatives, non-linear reinsurance and sophisticated risk mitigation techniques) can be modelled more adequately;
- in the Pillar II assessment of the Pillar I SCR, internal models provide a framework for the discussion between supervisors and risk managers about the risk parameters used for risk management;
- cost efficiencies are possible: capital and risk management infrastructure can be re-used for discussion with supervisors, rating agencies, analysts and shareholders;
- the continual development of the model is in the undertaking’s own interest; and
- internal risk models tend to produce more detailed and timely risk exposure data than is generally available in accounting records. Ongoing supervision of internal models gives supervisors easier access to and familiarity with such data.

11.8 The overall supervisory resources needed for validation depend on

- how many undertakings apply for the use of internal models (and meet the minimum requirements); and
- the cost of each individual validation.

Differences in the availability of supervisory resources and the spectrum of insurance undertakings in each market mean that Member States should have some flexibility to influence both of these factors.

11.9 The relative attractiveness of internal models compared to the standard formula is influenced by:

- the degree of conservatism in the calibration of the standard formula;
- the restrictiveness of the rules on partial modelling;
• the costliness of approval and supervision of the internal models and how the costs are shared between individual undertakings and the supervisor; and

• the strictness with which qualitative criteria (use test) are applied by the supervisor.

The first two are necessarily harmonized at the European level, while the latter two may offer some scope for influencing the number of applicants in each Member State.

11.10 CEIOPS expects that supervisory benefits will be highest where internal models are recognised for

• large insurance undertakings and reinsurance undertakings; and

• innovative or niche players, independent of their size and legal form.

The framework should be designed in a way that it invites such undertakings to apply, but it should not present explicit barriers to entry for others.

11.11 For larger undertakings, the complexity of the business may increase the degree to which the standard formula is an unacceptable approximation of the true risk profile - for example, because the standard formula treats diversification effects in a relatively simple manner. Conversely, the standard formula may not address risks that are particular to innovative or niche business and the internal model may actually be simpler than the standard formula for such cases.

11.12 In each individual case, the cost of validating internal models depends on

• how well gaming the system is limited by the overall framework;

• the extent to which the supervisor can benefit from guidance at the European level;

• the degree to which undertakings use input data and modelling approaches that are standardised at the national or European level; and

• the intensity with which the internal capital adequacy assessment process is examined as part of the Supervisory Review Process, regardless of whether the internal methodology is also used as a basis for Pillar I.

The latter two points may provide some flexibility to influence resource requirements at the national level.

11.13 Aspects of the framework that potentially limit gaming by undertakings are:
• Qualitative requirements for the use of an internal model within the risk management of an undertaking, especially such requirements for the use of partial models.

• The use of principle-based valuation criteria, rather than prescriptive rules. Peer-review among supervisors is needed to ascertain harmonisation of regulatory practices, which is dealt with in answer to CfA 17.

• If the undertaking would enjoy benefits from the approval of the internal model, then it risks losing its benefits when it 'over-optimizes' its calculations in areas that are difficult to measure and validate.

• If the SCR-target criterion were to be calibrated to a level such that it would be anticipated that most reasonably well-capitalized undertakings would in any event have available capital above the fair, internal SCR-estimate, 97 then the motivation for gaming the system would be reduced.

Conceptual Framework

11.14 An important aspect to consider is the degree to which internal models will be specified by the supervisor. In this context, it is useful to distinguish between

• internal models in a narrower, quantitative, statistical sense;
• internal models in a wider, risk management sense; and
• the capital requirement that is derived from the information that the actuarial model provides.

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97 This option is not acceptable to some CEIOPS’ members.
The narrower, actuarial view of the internal model is the system that transforms risk exposure data (how many contracts of which type are written) and risk driver data (historic information on the likelihood of certain events) to forecasts of profit and loss (P&L\textsuperscript{98}) distributions. In practice, an undertaking may use a collection of models that make predictions for the P&L at different levels of aggregation. CEIOPS calls the whole system that transforms input data into forecast P&L distributions the actuarial model\textsuperscript{99}.

11.15 However, the internal model is more than this mechanistic process. It should also encompass the way in which the actuarial model is integrated with the internal risk management system. Integration demonstrates that the actuarial model is genuinely relevant to the management of the business and has not been developed simply to satisfy regulatory requirements. Validation and approval of the internal model should apply in this broader context, rather than focussing solely on the actuarial techniques to arrive at the forecast distributions or the single SCR number.

11.16 The actuarial model can also be used as a basis to derive the capital requirement. While the SCR estimate will be computed by the undertaking, the way it is derived from the distributional forecast is fully specified by the regulatory framework and hence not part of the internal model. The distinction between SCR estimate, Pillar I SCR and adjusted SCR does not imply that there should necessarily be a difference between the three, but it facilitates the discussion on how the link from the internal model to the SCR should be defined and in which pillar.

Compliance Criteria

11.17 For the actuarial model, three different aspects might be considered:

- **input criteria:** concerning, for example the quality of data and the scope of the model (what can and can't be included);

- **process criteria:** the inner logic for how the model should produce its required output; and

- **output criteria:** for example, the requirement to produce a full distribution, or to use a certain risk measure.

11.18 SCR criteria set out how the output from the internal model is transformed into a capital requirement.

\textsuperscript{98} Within the answer to CfA11, "P&L" shall mean the change in economic value (plus any intermediate cash flows) of assets minus liabilities over the time horizon that is the basis for the SCR target. Within the internal model, economic valuation and risk measurement need to be consistent.

\textsuperscript{99} The 'actuarial model' is used as a short-hand for 'the internal model in a narrower, quantitative, statistical sense' in the rest of the answer to CFA 11. The use of the attribute 'actuarial' does, however, not imply that the actuarial model is solely within the responsibility of the actuarial function in the sense of A.22.
11.19 Risk management criteria set out how the actuarial internal model should be integrated with an undertaking’s wider risk management.

11.20 The national supervisor could retain control over key variables, coefficients or the aggregation of components in the actuarial model. Restrictions could also be imposed at the European level. For example, insurance undertakings could be required to use certain types of exposure or risk driver data, or to combine them in a particular way. Such a model might be more straightforward to validate in a consistent manner, but it would not encourage a global view of risk in insurance undertakings. In practice, there would be little difference between a model with a high degree of supervisory prescription and a very complex standard formula. Such a complex formulation might even be more costly to validate than a genuinely internal model.

11.21 A more flexible approach would distinguish between requirements on

- the input of the model;
- the inner logic of major building blocks (e.g. risk components);
- the aggregation of these building blocks;
- the output of the actuarial model; and
- how that output is used by the supervisor to determine the SCR.

Restrictions on inputs and the inner logic of the internal model could stifle innovation, since rules on risk driver data input may become obsolete through innovations in the financial markets or improvements in insurance risk driver information, for example, NatCat data. Rules on risk exposure data may become obsolete through product innovation at the undertaking itself. Some requirements on the aggregation of major building blocks are necessary for the harmonisation of partial models. Requirements on the output of the actuarial model and the SCR-computation are necessary to achieve robust capital requirements that are in line with the prudential objectives of the SCR.

11.22 There are several alternatives to prescribing the structure of inputs and inner logic, while still maintaining efficient supervisory control of risk taking in 'difficult areas':

- use a floor (like MCR) for the internal model as a safety net;
- use other prescriptive rules as safety nets that accompany the internal model;
- use robust risk metrics: if information about the far tail is not available, use location and scale of the distribution as a risk

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100 The 'IRB' treatment of credit risk in the Capital Requirements Directive is an example of such an approach. Banks are required to estimate a set range of variables (probabilities of default, loss given default, exposure at default, maturity). But even under the most advanced approach, the transformation of these variables into a capital requirement follows a set formula in which key risk drivers (such as the correlation between default probabilities on individual exposures) is fixed.
metric; translate to the proper level of prudence by making assumptions on the shape of the distribution;

- use robust estimators instead of estimators that are optimal only in a specific model.

11.23 The more flexible approach could ensure that the actuarial model retains its relevance in the wider risk management context. With a limited degree of prescription, insurers are able to select the theoretical approach that is most appropriate to their individual circumstances. The model can be continually upgraded as financial markets, actuarial science and technology evolve. This would suggest that the regulation of internal models should be expressed in terms of broad principles. But it should be noted that the degree of subjective judgement on the part of individual supervisors might have implications for harmonisation.

11.24 Within the Swiss Solvency Test\textsuperscript{101} it is argued that the evaluation of actuarial models has similarities to the scientific method:

- use of objective quality/target criteria, such that the quality of the model’s predictions can be objectively tested;

- use of extensive peer review.\textsuperscript{102}

This raises the important question how the cooperation and exchange of information between supervisors, consulting companies and undertakings should be organized and linked to establishing proper guidance on level 3. This will be considered further in answering CfA 20\textsuperscript{103}.

**Input and process criteria for the actuarial model**

11.25 Under a flexible approach, requirements on the inputs and inner logic of the actuarial internal model would be described more as general quality criteria than as prescriptive rules. This implies that the model may use different risk driver categorizations than the standard formula and that internal modelling across all business lines and all risk driver categories is allowed in principle. However, an undertaking should be able to justify its choices to its supervisor.

11.26 Standardization of contract terms and pooling of risk driver data should help undertakings improve the quality of the input data they use in their actuarial models. But the availability of richer external data should also help facilitate a greater understanding of the risks to which an

\textsuperscript{101} Presentation by Phillipp Keller (March 1, 2005): *Supervisory framework for risk assessment and risk-based solvency*, slide 66.

\textsuperscript{102} See also Beglinger, S. (2004) – *Regulation of the non-life insurance industry: Why is it so damn difficult?*

\textsuperscript{103} CEIOPS-CP-06/05, available on CEIOPS’ website: www.ceiops.org.
individual undertaking is exposed and therefore act as a stimulus to the
development of internal models.

Output criteria for the actuarial model

11.27 The backtesting of VaR models for market risk in banking is based on
daily observations and therefore generates enough exceptions data to
test the adequacy of the calibration. This would not be appropriate in
the context of the (longer) time horizon and (more stringent)
prudential objective of the SCR. Forecast distributions are therefore
necessary to enable assessment of the actuarial internal model through
actuarial/statistical techniques.

11.28 If the method that produces the SCR estimate is considered as a
deterministic formula, then it could result in a 'black box' that is nearly
impossible to validate. If, in practice, an undertaking uses a
deterministic formula for the computation of the SCR estimate, then
this formula should be justified by reference to stochastic models and
distributions. The distributions form the basis for dialogue between an
undertaking and its supervisor, offering a much more detailed source of
information than a single SCR number. As an example, the SCR
estimate may be computed using a scenario-based method on a day-
to-day basis. But the choice of scenarios needs to be justified by
reference to the stochastic modelling.

11.29 Certain 'difficult areas', especially long-tail non-life business, are
characterized by extremely high uncertainty about the likelihood of the
events that are relevant for the computation of the SCR.\footnote{CEIOPS notes that \textit{difficult area for risk measurement} is often business with the greatest potential for
profit (as well as loss). To allow and encourage EEA insurance undertakings to remain competitive, the use
of the best available models in the high-margin business areas should be allowed and encouraged.} Information
may be scarce in the sense that a limited number of independent
observations are available. While location and scale of such a
distribution can be well estimated, there is virtually no information
about the far tail – the 200-year event – in the data. But allowing
undertakings to estimate a distribution at least provides the supervisor
with more information than the equivalent treatment under the
standard formula (i.e. a stochastic model provides a confidence interval
for risk estimates, while the error of the standard formula may be
unknown.) The way the capital requirement is derived from the
distribution may reflect concerns over the robustness of the SCR.

SCR criteria

11.30 The capital requirement is produced by the application of a risk
measure to the forecast P&L distribution. To aid comparability (and to
secure a level playing field), this risk measure should use the same
underlying principles as the standard formula expressed in the answer
to CfA 10.
Risk management criteria

11.31 It might be useful to distinguish two separate control loops, namely the 'risk control loop', which uses the actuarial model to steer risk-taking activities on a shorter time scale, and the 'model change control loop', which continually checks the suitability of the actuarial model for risk control and adapts it to the changing environment. Both control loops typically consist of several business processes. Supervisors must ensure that these processes are in control and capable of producing appropriate results.

11.32 The risk control loop typically consists of several processes:

- the collection and verification of market data and other risk driver data;
- the collection and verification of risk exposure data and mapping assumptions;
- the regular computation of risk numbers and the reporting to Senior Management and Board of Directors\textsuperscript{105};
- the construction of a risk limit or risk steering system from the strategy and risk profile of the undertaking; reporting limit breaches to Senior Management and Board of Directors where appropriate; response to limit breaches by Senior Management; and
- risk-sensitive product pricing by computing risk contributions of individual products.

11.33 Over time, a model may need to evolve to incorporate changes to the undertaking’s business, or improvements become possible which would give a better reflection of the undertaking’s risk profile. Insurance undertakings should have some flexibility to change their internal models to ensure that they remain relevant. However, supervisors should retain some degree of control over the evolution of an internal model. The main processes of the model change control loop are:

- the new product process that ensures the establishment of the necessary risk driver data and risk exposure data for the new products of the business lines;
- the new risk driver process ensures that the choice of explanatory risk drivers is up to date (new databases on mortality data, new motor insurance data, new weather data, new credit derivatives);
- back-testing; and

\textsuperscript{105} The terms 'Board of Directors' and 'Senior Management' are used in a functional rather than legal interpretation, since the legal interpretation varies between Member States. See IAIS Insurance Core Principle No.9.
• sensitivity analyses that have the goal to test the influence of certain model assumptions and quantify weaknesses of the model.

11.34 A number of possible techniques could be used for performing sensitivity analysis, including, for example:

• analysis of the relationship between a full valuation using scenarios and an approximation using sensitivities;
• analysis of the effect of the inclusion or deletion of risk drivers;
• analysis of the effect of different estimation procedures;
• analysis of the effect of the observation period of risk drivers; or
• analysis of the effect of alternative model assumptions.

Approval & ongoing supervision

Testing the actuarial model

11.35 The aim of the 'statistical quality test' is to ensure that the actuarial internal model has sufficient accuracy and reliability to support internal risk management and computation of the SCR. The statistical quality test includes the evaluation of the internal consistency of the modelling, the reliability and quality of input data, the quality of the forecasts provided by the model and whether the modelling is in line with widely accepted minimum standards of actuarial science and mathematical statistics. Evaluation of forecast performance can be based on general statistical methodology for the evaluation of the quality of distributional forecasts.\(^{106}\)

Testing the SCR estimate

11.36 Supervisors should not expect an unattainable degree of precision in the models developed by insurance undertakings. The aim of the

\(^{106}\) Statistical methodology for the evaluation of forecasts has been developed in a very general context by Dawid, in the context of econometric forecasting (Diebold, Berkowitz) and in the context of the evaluation of VaR forecasts (Berkowitz, O'Brien, Finger, Stahl, Overbeck):

Dawid (1986) 'Probability forecasting' – *Encyclopedia of Statistical Sciences*


'calibration test' is to assess whether the SCR derived from the model has the appropriate level of prudence. The burden of performing the computations that underlie the calibration test could be assigned to the undertaking, with the obligation of the supervisor to check the results. Due to the statistical uncertainties associated with 200-year-events, and difficulties in estimating and validating correlations, the desired absolute level of prudence can only be a target. It is more important to check whether the manner in which the SCR is derived from the internal model is comparable across undertakings.

11.37 It has been suggested that the undertaking is required to perform a quantitative analysis to ascertain its model’s performance against prescribed benchmarks. Depending on the calibration test the supervisor may require the undertaking to calculate and apply a recalibration factor, quantifying the extent to which an undertaking underestimates its risk — if at all. CEIOPS will consider whether and how such a recalibration factor could be estimated in a reliable and consistent manner. The supervisor might then be given the power (within certain limits) to increase the SCR under Pillar I to the proper level of prudence through multiplying the undertaking’s SCR estimate by the appropriate recalibration factor. The degree to which this flexibility should be limited and its implications for harmonisation would require further discussion.

11.38 However, it should be noted that designing a calibration test which would provide a non-arbitrary recalibration factor is not a trivial task. Alternatively, a calibration test that results in a ‘yes or no’ answer may be easier to design than a measure of the correction to be made. It would be more consistent with the view that, in the context of internal models, the burden of developing an appropriate measure of the risk an undertaking is exposed to lies on the undertaking itself instead of the supervisor.

**Testing risk management**

11.39 The overall aim of the use test is to assess whether the control loops associated with risk management function properly. The undertaking has to demonstrate that the actuarial model is genuinely relevant for and used within risk management and is in line with the overall policy on solvency capital (see para. 10.81). Furthermore, the undertaking has to demonstrate that proper processes are established, which ensure that the model remains useful, and that these are applied consistently over time.

11.40 Among the auditing tools that are widely used by auditors, consultants and supervisors are

- visualizations of lines of responsibilities (organisation charts),

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107 This is suggested in Jaschke, Stahl & Stehle (2005) - *Value-at-Risk Forecasts under Stress – The German experience* as an alternative to the Basel back-testing procedure.
• visualizations of flows of products and information along business processes (flow charts) and
• visualizations of the most important control systems (control loops).

11.41 The two control loops identified in paras. 11.31 and 11.32 are the framework for identifying the actual business processes that an undertaking has established. Once the actual business processes in the undertaking are identified, the examination looks at whether processes are 'in control' and 'capable'.

Safeguards

11.42 In its CfA, the Commission Services note that prudential aspects regarding the transition from the standard formula to internal models should be addressed, including the risk of modelling errors. Safeguards could be envisaged that ensure both supervisors and undertakings can begin to enjoy the benefits of internal models at an early stage, without undermining the objective of policyholder protection. In particular, the supervisor can be given the opportunity to test how an undertaking’s internal model performs in practice before allowing significant reductions in regulatory requirements.

11.43 A period of parallel running might assist supervisors in determining whether the SCR calculated using an internal model is an adequate reflection of an undertaking's risk profile. An undertaking would produce an SCR calculated under the standard formula alongside the estimate produced by its internal model. A supervisor would need to be reasonably satisfied that material differences in capital requirements resulted from risk characteristics that the standard formula would not be capable of capturing. The result of this analysis might be adjustment of the SCR estimate, requirement of changes to the model or withdrawal of model approval.

11.44 In the banking context, a descending floor has been used to smooth the transition between approaches to calculating regulatory requirements. Undertakings that wish to use the 'Internal Ratings-Based' approach for credit risk or the 'Advanced Measurement Approach' for operational risk must also calculate the equivalent requirements under the standardised approaches. In the first year of the Directive’s implementation, a floor of 95% of the equivalent standardised calculation is imposed on the internal calculation. This percentage falls to 90% and 80% in the second and third years. A similar approach could be considered for implementing Solvency II.

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108 CEIOPS notes the transitional arrangements put in place for the Capital Requirements Directive, where parallel running is possible before the Directive’s implementation. This gives supervisors the ability to recognise models at an early stage.

109 See Article 152 of the Capital Requirements Directive for credit institutions and investment firms.
11.45 It is unlikely that any recalibration factor for the SCR would be capable of addressing deficiencies arising from control or operational weaknesses. It would also be difficult to reflect any necessary cyclical adjustments, or to capture differences in regulatory risk-appetite. The Pillar I SCR may therefore be adjusted at the discretion of the supervisory authority to arrive at an 'adjusted SCR'. Adjustments should enable regulatory recognition of a model at an early stage, while allowing an undertaking time to consider the need for improvements. The obligation to hold more capital add-on does not indemnify the insurance undertaking from finding a remedy from the deficiencies within a reasonable timeframe.

In line with CEIOPS’ Answer to CfA 4 (para. 158) on transparency of supervisory action\textsuperscript{110}, the reasons for any adjustment to the SCR need to be explained. Specific reasons for potential Pillar II adjustments to the SCR from the viewpoint of the validation of internal models are:

a) to make a model approval not a binary yes/no decision, but allow some flexibility;

b) to separate the Pillar I validation of a firm specific internal model from systemic or macroeconomic considerations in Pillar II.

Not meeting minimum requirements will lead to the rejection of the internal model. A potential Pillar II SCR adjustment may be means to approve a model that is beneficial, despite its deficiencies. As a consequence the Pillar II SCR adjustment will have a natural restriction.

\textbf{Withdrawal of approval}

11.46 If further analysis by an undertaking or its supervisor suggests the internal model is no longer an appropriate substitute for the standard formula, the supervisor may withdraw approval for the model's use. Possible reasons include:

- evidence that the model is no longer appropriate (e.g. through backtesting or sensitivity analysis); or

- evidence that the model cannot be adapted to a fundamental change to the business.

Restrictions on withdrawal at an undertaking’s initiative are needed to limit 'cherry-picking in time'. Undertakings should not have the option of switching back to the standard formula simply because it delivers a more favourable result.

\textsuperscript{110} CEIOPS-DOC-03/05, available on CEIOPS’ website: www.ceiops.org.
Partial models and the interplay with the standard formula

11.47 Conceptually a grid could be drawn by categorizing risk exposure data across lines of business and risk driver data across risk categories. Each combination is referred to as a segment.\(^{111}\)

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If internal modelling is confined to rows, columns or segments of the matrix, and it is used to substitute parts of the standard formula for the computation of the SCR, then this will be called a partial internal model.

11.49 In principle, a partial model could apply to any line of business (row), risk category (column) or combination (segment).\(^{112}\) In practice, any partial approach might present considerable validation difficulties. If the partial model applies to a complete row, then risk drivers in the model for the business unit need not be the same as those of the standard formula. Conservative assumptions on diversification should be used to aggregate the SCR derived from the partial model with the SCR of the other business units as computed by the standard formula.

11.50 Partial modelling along columns is more challenging to validate, but needed, for example, for the approval of ALM-systems that model the influence of interest rates on P&L across business lines. A pre-requisite for such partial models is that risk drivers of the partial model have a certain degree of consistency with the risk drivers of the standard formula. Moreover, a natural decomposition of the P&L is needed, such that the appropriate part of the P&L can be attributed to the influence


\(^{112}\) If the partial model applies to a complete row, then risk drivers in the model for the business unit need not be the same as those of the standard formula.
of the modelled risk driver. This is necessary to enable application of the statistical quality test to the decomposed P&L.

11.51 In segments where the standard formula for the SCR is inappropriate, a supervisor should have the power to require an undertaking to adopt a partial or full internal model, if this seems feasible. There is an obvious tension, however, between compelling an undertaking to develop a model and satisfying the 'use test'.

11.52 There are important differences between internal models and the standard formula for the computation of the SCR:

- The defining property of an actuarial model is that it provides a forecast for the whole distribution of the profit or loss (P&L) of a portfolio instead of just one parameter of that distribution (VaR/TailVaR) like the standard formula.

- The standard formula will usually be only applied to the top level portfolio of the legal entity at hand, while an internal model will usually be applied to several levels of aggregation.

11.53 If the standard formula were not just a formula, but a fully specified, actuarial model structure that provides the qualitative properties of an actuarial model, then this would promote internal model enhancements to the 'standard model'.

11.54 The benefit of 'simple enhancements to the standard formula' should be considered. CEIOPS must avoid regulation that invites every European insurance undertaking to bargain with their supervisor on every parameter of the standard formula. Gaming the supervisor on the parameters of the standard formula is neither beneficial for the companies nor for the supervisor (representing society). There should be a clear distinction between adjustments to the standard formula and partial internal models. Bargaining the parameters of the standard formula should not be done at the company level.

**Information technology**

11.55 To the extent an internal model used in the context of the SCR makes use of information technology (IT) resources, additional criteria are required.

11.56 IT systems are essential and supportive for all aspects of insurance business and especially for risk modelling and management procedures. Hence, requirements concerning IT systems are closely related to all other aspects of internal models and should not be formulated in a detached way.

11.57 Proper IT risk management routines should independently from the use of internal models have already been implemented within the company, and any IT routine for internal models should naturally be included in the overall IT risk management.
There should be few descriptive rules or other restrictions on the form of the IT approach. In particular, the trend of decentralizing the risk management procedures should not be inhibited, provided that suitable regard is paid to the global risk position. 'Data-warehousing', consisting of the collection of data from each business unit into one overarching data warehouse for the entity, tends to be too inflexible and can lead to data consistency problems. While consistency is important, over-centralisation should not be imposed by the supervisory authority.

Internal models are likely to involve complex IT solutions. The documentation thereof should be suitable to support the validation process of internal models; in particular intermediate results should be checkable. Hence, the documentation of IT solutions should be proper and transparent. Moreover, it would be useful if IT solutions contained open standardized interfaces and standardized file formats (for e.g. for risk driver and exposure data) to ensure fast and easy data transmission to the supervision authority.

Making use of these data transmissions, supervisors would have the possibility to install processes for speedy review of models and changes to models, and to ensure that the internal model continues to reflect the circumstances of the undertaking.

Some of the software associated with the internal model may be 'external-provider' solutions or a mixture between 'external-provider' and 'in-house' solutions. When it comes to outsourcing, the use of external-provider software or data does not relieve the undertaking from responsibility for any aspects of the use of the internal model which would apply if the internal model were in its entirety an in-house solution.

The parts of an internal model which are subject to outsourcing should not be a 'black box' system, i.e. the supervisory authorities should be supplied with a proper and transparent documentation of these parts as well.

**CEIOPS' Advice**

**Supervisory aims with regard to internal models**

11.63 CEIOPS supports the inclusion of a specific article in the Framework Directive that sets out how the SCR might be calculated using an internal model.

11.64 The Framework Directive should encourage undertakings to measure risks with sufficient and proper accuracy, and to continually upgrade their models as financial markets and technologies evolve. The regulatory framework for internal models should give supervisors the flexibility to base their assessment of required capital on the
undertaking’s internal model, if that provides better and more reliable information than the standard formula.

**Costs and benefits**

11.65 CEIOPS supports the creation of a framework for the regulatory recognition of internal models, since the development of internal models can potentially deliver a wide range of benefits to supervisors, undertakings and, ultimately, policyholders.

11.66 CEIOPS expects that supervisory benefits will be highest for innovative or niche players, large insurance undertakings and reinsurance undertakings. Further cost-benefit analysis might be performed to determine for how many and which undertakings the recognition of internal models for Pillar I purposes would potentially deliver the most supervisory benefits. The solvency framework should be designed so that such undertakings are encouraged to apply for model recognition. But cost-benefit analysis should focus on testing the practicalities of the requirements for internal models under Pillar I (e.g. the costs to insurance undertakings of developing a model that satisfies regulatory requirements) rather than being used to justify the creation of barriers to entry.

11.67 Some flexibility in those aspects of the framework that influence supervisory resource requirements is needed to account for national differences. Peer reviews among supervisors should be used to establish a level playing field.

**Conceptual Framework/Compliance Criteria**

11.68 Subject to meeting validation and approval constraints, there should, in principle, be no limitation on the range of model approaches an undertaking might adopt for its actuarial model. But an undertaking must be able to justify its selection to the supervisor, explaining why the chosen approach will deliver a better reflection of its risk profile than the standard formula.

11.69 Regardless of its source, input data for the actuarial model should be of sufficiently high quality. The cost of validating the quality of data for supervisory purposes should be borne by the undertaking—particularly data that arise from the undertaking’s own loss experience.

11.70 Placing no restrictions other than general quality criteria on the input and the inner logic of the actuarial model might have some advantages. However, further consideration is needed to determine whether such an approach would deliver a practicable standard for SCR internal models. A balance needs to be struck between giving insurers the flexibility to develop models that genuinely reflect the risk profile and fit their risk management processes on the one hand and setting a minimum level of prescription to ensure comparability.
of the SCR estimates on the other hand.

11.71 If, in practice, an undertaking uses a deterministic formula for the computation of the SCR estimate, then this formula should be justified by reference to stochastic models and distributions. Otherwise, it could result in a 'black box' that is nearly impossible to validate. The distributions form the basis for dialogue between an undertaking and its supervisor, offering a much more detailed source of information than a single SCR number. This does not preclude the use of deterministic, scenario-based methods in day-to-day risk management.

11.72 A risk measure should be applied to the output of the actuarial model to produce an estimate for the SCR. The SCR estimate should be calibrated to achieve comparability with the calibration of the standard formula.

### Risk management criteria/Roles and responsibilities

11.73 The answer to CfA 1 sets out a framework addressing general aspects of governance, risk management and internal control. If an internal model is used for calculating regulatory requirements, these general aspects need to be amplified by specific criteria.

11.74 The internal model is part of a comprehensive risk management system, which must possess adequate resources and structures to ensure properly functioning processes.

11.75 The Board of Directors is responsible for the use of internal models. It must ensure that the relevant organisational structures and adequate resources are in place.

11.76 The Board of Directors and Senior Management should be actively involved in the internal control and establishing risk management processes associated with the internal model. There must be appropriate documentation and sign-off of the internal model process at Board of Directors and Senior Management level. These parties must have a general understanding of the internal model. Senior Management must have a good understanding of the operation of the internal model and has responsibility for ensuring that risk management processes are followed. The approval of the supervisor to use the model for the SCR calculation does not diminish this responsibility.

11.77 Models should be allowed to evolve over time in line with risk management developments in individual undertakings, but failure to meet the compliance criteria on an ongoing basis may prompt withdrawal of supervisory approval. Monitoring this evolution will have resource implications for supervisors. The Board of Directors and Senior Management should design and implement a model change policy.

11.78 There should be appropriate internal audit procedures of risk
management processes relating to internal models, conducted at least once a year. The results of such reviews must be documented.

**Approval & ongoing supervision**

**11.79** The monitoring of the results of the actuarial model and thus the undertakings’ risk profile should be an integral part of the supervisory review process. CEIOPS recommends that the approval of an internal model for an undertaking’s SCR calculation should be subject to:

- a **statistical quality test**;
- a **calibration test**; and
- a **use test**.

**11.80** An undertaking should be responsible for meeting the costs associated with approval of its internal model for the purposes of calculating the SCR. An undertaking should also ensure that it continues to meet these tests, notifying its supervisor of any material breach. In addition, supervisors should have the power to review compliance with these tests on an ongoing basis – not simply when the model is submitted for approval.

**11.81** An undertaking may improve its internal model in line with a model change policy agreed with the supervisor. Provided the amendments do not lead to material changes in the results obtained from the model, it is not necessary to re-test the model. Supervisors may test adherence to this policy and the functioning of the model change control loop.

**11.82** An undertaking should use an approved internal model for its SCR calculation until its approval to do so is withdrawn by the supervisor. Undertakings should not have the option of switching back to the standard formula simply because it delivers a more favourable result.

**11.83** Supervisors should have the power to either, reject the actuarial model, require improvement or require the undertaking to calculate and apply a recalibration factor. CEIOPS will consider whether and how such a recalibration factor could be estimated in a reliable and consistent manner. Supervisors may also impose a period of 'parallel running' to compare the results generated by the internal model with the standard formula. A descending floor might be used to ensure that the transition to internal models for the SCR calculation does not result in sudden, extreme changes in regulatory requirements.

**11.84** As with the standard formula, the SCR calculated using an internal model (including any recalibration factor) may, if necessary, be further adjusted at the discretion of the supervisory authority to arrive at an 'adjusted SCR' which operates as a separate solvency control level. It should be clearly recognised that the imposition of an adjustment in these circumstances is not a means of solving the deficiencies in the quantification of risk, which must be addressed via
requirements to improve the internal model, but of covering the additional risk in the meantime.

Partial models and the interplay with the standard formula

11.85 In principle, partial internal models should be permitted for calculation of the SCR. Aims and benefits are

- to ease transition from the standard formula to 'full' internal models;
- to encourage innovation and specialization to certain business areas;
- to deal with exceptional cases, like the merger of two undertakings (one with an approved model, the other using the standard formula) in a pragmatic way.

However additional constraints on the use of partial models are appropriate in order to avoid 'cherry-picking'.

11.86 A partial internal model is to be considered as an internal model in the sense of the above conceptual framework. Therefore a close alignment between rules on full and partial use of models is essential. The approval of partial models should be governed by the same principles as any other internal model. The same set of compliance and validation criteria – statistical quality test, use test and calibration test – should be required, enhanced by tests for 'cherry-picking'.

11.87 CEIOPS should be commissioned to develop not just a standard formula, but also provide a detailed actuarial rationale behind the overall formula and each individual element of it. This would support undertakings in developing and using partial models by enabling them to establish relationships between their internal approaches and the standard formula. As a result, undertakings could implement partial modelling approaches by proposing enhancements to the standard model.

11.88 Proposed enhancements to the standard model must prove their economic benefit for both an undertaking and its supervisor through individually passing the full array of tests – statistical quality, use and calibration – applied to internal models. Insurance undertakings should present a clear rationale for proposing any enhancements to the standard formula. Enhancements should provide both an undertaking and its supervisor with a better understanding of the risks to which the undertaking is exposed. Use of data specific to the undertaking is not in itself sufficient for this purpose.

Information technology

11.89 IT solutions used in internal models should be documented in a
manner that supports the validation and approval process, regardless whether they are 'in-house' or partially 'external-provider' solutions.

11.90 In principle, there should be no restrictions or descriptive rules for IT systems. Limiting this flexibility would limit the undertaking’s ability to continually upgrade their IT systems as technologies evolve.

11.91 IT systems should be apt to support the review processes of internal models. For example, there should be open standardized data interfaces and file formats for proper and fast data transmission.
Reinsurance (and other risk mitigation techniques)

Extract from the Call for Advice:

The scope of this CfA is technically challenging. A starting point has to be a general assessment of an undertaking’s reinsurance program (and other risk mitigation programs, where relevant), which constitutes a major part of the risk management and internal control processes. Consequently, the supervisory review process is of fundamental importance when evaluating the credit that can be given for reinsurance with regard to solvency requirements (...).

At least the following areas should be addressed:

- the SCR standard formula should take into account insurance risk reduction effects brought about by reinsurance to the extent they can be reliably quantified and addressed in a standardised way
- also the possibility to take into account financial hedging should be analysed. Furthermore in order to avoid arbitrage opportunities, the capital requirements between different industries that provide products should not differ significantly.
- The internal model approach to SCR should allow for sound reinsurance, hedging and other risk mitigation techniques to the extent they can be reliably quantified for prudential purposes
- Current rules regarding the reinsurance reduction factor and the MCR should be reviewed in the light of SCR developments. Furthermore, the possibility to take into account financial hedging should be analysed in order to avoid regulatory arbitrage possibilities and to have consistency between SCR and MCR.

The Commission Services request CEIOPS to take into account reinsurance and other relevant risk mitigation techniques in its response to other Specific Calls for Advice of the Commission. This advice should involve the afore-mentioned general areas as well as more detailed topics identified by the IAA, i.e. credit rating of reinsurer, type of reinsurance, tail behaviour, non-linearity and correlation effects.

Background

12.1 Reinsurance is the key risk management tool in insurance, notably in non-life insurance, but also in life assurance, and is used in particular to mitigate certain volatile or extreme insurance risks. Other general risk mitigation methods include for example alternative risk transfer (ART). On the financial side, the hedging of investment risks through
derivatives is becoming an increasingly important risk mitigation tool, notably in life assurance.

12.2 Reinsurance and risk mitigation is such a complex, technical and entity-specific topic that it might best be treated for the most part through implementing measures and supervisory guidance. Where addressed in the Framework Directive, the wordings will have to be relatively general. Consequently the Commission Services do not consider appropriate to provide tentative legislative draft at this stage.

**Explanatory text**

**Risk mitigation measurement**

12.3 The Reinsurance Directive\(^\text{113}\) defines reinsurance as

\[ \text{the activity consisting of accepting risks ceded by an insurance undertaking, or by another reinsurance undertaking.} \]

Reinsurance therefore also includes retrocession. However, in this answer, CEIOPS does not need to define reinsurance formally, since the overriding consideration should be the extent of risk transfer under any product being assessed.

12.4 The different risk characteristics (transferred and acquired) of various covers will need to be considered. Acquired risks, such as credit risk or operational risk, also need to be taken into account in order to determine the complete impact of reinsurance (and other risk mitigation techniques) on the risk profile of the insurance undertaking.

12.5 Since the focus is on risk transfer, there should be no inconsistency of treatment between treaty and facultative cover, or between traditional reinsurance and other risk mitigation techniques simply because of their legal form or accounting treatment.

Reflection in technical provisions

12.6 Conceptually, the SCR standard formula is underpinned by a definition of ruin with a certain probability over some time horizon. Ruin is being defined by reference to the relationship between assets and liabilities at the end of the time horizon.

12.7 Generally, a reinsurance programme will have an impact on the relationship between an insurance undertaking’s assets in excess of liabilities where these are measured at, say, a 75\textsuperscript{th} percentile. In principle, the impact of a reinsurance programme on the relationship between assets and liabilities can only be determined by considering the position of the whole of the undertaking's business.

12.8 The effects of reinsurance on the relationship between assets and liabilities on this basis are complex and, in general, the value of assets in excess of liabilities may be significantly different measured gross and net of the effects of reinsurance. This is because of complex features relating to risk dependencies and the consequences of blending different risk distributions.

12.9 Despite this, a broad assumption is being made for the purpose of this answer that the numerical value resulting from quantifying assets less liabilities is the same net and gross of reinsurance. The materiality of the error in this assumption in terms of the applicability of any standard formula needs to be assessed.

Reflection in the MCR

12.10 According to CEIOPS' answer to CfA 9, the MCR reflects a level of capital below which an insurance undertaking’s operations present an unacceptable risk to policyholders. Reinsurance (and other risk mitigation techniques) can significantly change the risk profile of an insurer and therewith change the risk that the insurer’s operations present to policyholders. Hence, in principle, the MCR should take into account the impact of reinsurance and other risk mitigation techniques (including both risks transferred and acquired).

12.11 CEIOPS' answer to CfA 9 outlines three options for the calculation of the MCR for a method to be adopted after a transitional period:

- adopting essentially the existing Solvency I requirements;
- using the SCR standard formula as a reference;
- establishing a simple risk margin over and above liabilities.

Under all three options, it ought to be possible to make allowance for reinsurance in the determination of the MCR. Further analysis is required as to how this might be achieved, once the form of the MCR is chosen.
12.12 Under Solvency I, the adjustment in respect of reinsurance through means of a reduction factor relies heavily on retrospective information (particularly for non-life business), without proper regard to the insurer's current or coming reinsurance arrangements. This may have considerable shortcomings, not least that the undertaking's business mix may have changed materially and its reinsurance programme may have changed significantly. To appropriately incorporate reinsurance, adjustments may be necessary to reflect a more prospective view.

12.13 Using the SCR as a reference point could implicitly include the allowance for reinsurance in the MCR as the SCR includes an allowance for reinsurance.

12.14 If the MCR is calculated as a risk margin over and above liabilities, reinsurance could be incorporated by including net liabilities in the formula.

**Reflection in the SCR**

12.15 The aim of the SCR is expressed as having regard to an undertaking's overall risk profile. Reinsurance and other risk mitigation techniques may affect the risk profile of an insurer in a manifold and complex way. Accordingly, reinsurance (and other risk mitigation techniques) must be taken into account in the determination of the SCR. How these aspects are reflected in the SCR requires a trade-off between risk-sensitivity and practicability.

12.16 Generally speaking, the two most significant elements to be considered in the SCR standard formula when allowing for reinsurance are the extent of transfer of underwriting risk and the assumption of credit risk. Clearly, these two elements need to be considered in concert.

12.17 Some forms of risk mitigation would require in-depth (case-by-case) analysis of their impact on an insurance undertaking’s capital needs. In practice, this may rule out automatic allowance for their effect in the SCR standard formula.

12.18 Provided that the general requirements for SCR internal models are satisfied, there should be no further restriction on allowing for the impact of reinsurance (and other risk mitigation techniques) on capital requirements. This would require reliable estimation of risks transferred and acquired (including, for example, credit risk and basis risk).

12.19 Risk mitigation could have a material impact on an insurance undertaking’s capital requirements. This could be assessed by requiring undertakings to provide an estimate of the SCR without allowance for the impact of risk mitigation. Such an estimate could:

- give supervisors one possible measure of an undertaking's dependence on reinsurance, which could be used as the basis for determining an appropriate supervisory response;
• provide an estimate of an undertaking's contingent credit exposure, which could result in an additional requirement under the SCR;

• assist insurance undertakings in their reinsurance planning and management.

However, CEIOPS recognises that systematically requiring such an estimate could increase the calculation burden on undertakings.

12.20 When analysing underwriting risks with 'fat tails', the risk measure applied is of particular importance. VaR, for instance, analyses the risk only up to a specified level of confidence. The shape of the tail of the risk beyond this level of confidence is ignored. This tail consists of low-frequency, high-severity claims. Therefore, VaR cannot detect to what degree the reinsurance programme of an insurance undertaking mitigates these high-severity claims. By contrast, TailVaR is sensitive to the shape of the tail of the risk (by estimating the average claims size of the claims in the tail). From the perspective of reinsurance, TailVaR is therefore preferable to VaR.

12.21 The treatment of umbrella, whole-account and other multi-line covers will follow the same principles. Under the standard formula approach, there will need to be some practical means of allocating the effects of the risk mitigation to different lines of business.

Reinsurance risk management

12.22 Although the CfA is mainly written for Pillar I issues, the policies and procedures that undertakings have in place for evaluating the adequacy of reinsurance cover must be taken into account as part of insurance undertakings’ risk management and internal control systems and consequently as part of the supervisory review process.

Reinsurance Management

12.23 Reinsurance Management is an ongoing process that is required to ensure that a proportion of an insurance undertaking’s risks is kept at an acceptable level through appropriate reinsurance arrangements. Such arrangements can consist of traditional reinsurance involving the transfer of insurance risk through conventional carriers and products as well as non-traditional, or financial, reinsurance, which are addressed in the advice on Reinsurance Management.

12.24 Reinsurance Management includes the definition, implementation, monitoring, reporting and control of reinsurance arrangements.

12.25 Reinsurance Management plays an important role in an insurance undertaking and in its risk profile. Using traditional or financial reinsurance, an insurer can reduce risk, stabilise its solvency levels, use available capital more efficiently and expand underwriting capacity.
12.26 Both the solvency and liquidity of an insurance undertaking could be jeopardised in the event of deficiencies in the reinsurance arrangements.

12.27 The Reinsurance Management Strategy shall, among other things:

- identify the overall risk tolerance limits of the undertaking;
- identify the maximum net risk to be retained, appropriate to the established risk tolerance limits;
- set types of reinsurance arrangements that the undertaking considers appropriate to its type of business and risk profile, with particular reference to long-tail liabilities;
- identify, for all lines of business, the maximum foreseeable amount of reinsurance protection that will need to be purchased from individual reinsurers, based on the difference between the total amount of gross business the insurance undertaking expects to be able to write and the amount of business that can actually be written on the basis of the available capital of the insurance undertaking;
- identify, for all lines of business, whether there is sufficient capacity available on the reinsurance market to cover the amount of reinsurance protection required;
- define policies in the event that the matching of the undertaking's underwriting and its reinsurance programme cannot be obtained at all times, e.g. counter-measures as well as clear links to other areas affected by the change or (partial) loss of reinsurance cover in the case that reinsurance contracts cannot be renewed to accord with current terms/conditions or because of a reinsurer's defaults;
- set limits on the amount and type of insurance that will be automatically covered by reinsurance (e.g. treaty reinsurance);
- set criteria for acquiring facultative reinsurance cover;
- set principles for the selection and monitoring of reinsurers with particular attention to the following:
  - The security of the reinsurers, with particular reference to counterparty credit risk, should be assessed before entering into the reinsurance contract, as well as the security on an ongoing basis, especially with regard to reinstatement premiums to maintain every individual instance of reinsurance cover.
  - The diversification of the reinsurance cover. Some aspects that undertakings might wish to consider when deciding on their reinsurance programme are, for example, the claims paying ability rating of the reinsurer and the true diversity of the
particular reinsurer(s)’ aggregate portfolio(s). Where possible and appropriate the reinsurance cover should be diversified among a number of reinsurers to improve the overall security of the reinsurance programme and to avoid concentration risk.

- The amount of collateral, if any, that the insurance undertaking may require from individual reinsurers at any given time, depending on the particular circumstances.

• provide for the maintenance of an up-to-date register of reinsurers, as approved by the Board, including the maximum level of exposure for each reinsurer. This register shall be available to the supervisory authority on request;

• identify the process of monitoring, reviewing and amending the Reinsurance Management Strategy in response to changes in the risk profile of the undertaking or in the market conditions; and

• set principles for the management of liquidity risk related to the time interval between the payment of insurance claims and the amounts being recovered from reinsurer.

12.28 The Reinsurance Management Strategy should also describe the main risk management and internal control procedures related to reinsurance operations and shall at least describe the following procedures:

• for monitoring the implementation of the overall reinsurance management strategy;

• for verifying the retention limits established;

• for monitoring confirmation of reinsurance documentation;

• for monitoring reinsurance recoverables; and

• for monitoring the security of each reinsurer.

**ART Strategy**

12.29 Notwithstanding the definition for the overall Reinsurance Management Strategy, the ART strategy, which should be implemented and documented by Senior Management, shall also:

• identify the rationale for using ART;

• ensure that ART arrangements include genuine risk transfer before they may result in a change in the SCR;

• identify the risks to be covered by ART arrangements;

• ensure that ART arrangements fully reflect all of the risks that are to be covered;
• identify the counterparties to be used and evaluate the credit risk associated with these operations;

• identify the procedures for ongoing monitoring of the arrangements with a review to be undertaken at least on an annual basis; and

• demonstrate that the ART arrangements are appropriate in relation to the risks to be covered.

**Financial hedging through the use of derivatives**

12.30 The answers given to CfAs 5, 6 and 9 form the basis for the use of derivatives. Insurers can use derivatives as a risk mitigation (including in this context diversification) mechanism on either the asset or the liability side of the balance sheet. In this answer, derivatives used in connection with liabilities, are discussed in the section on ART.

12.31 The use of these products should contribute to the reduction of both market and credit risk, and to other ALM considerations. Insurers must have the ability to recognise, measure, and prudently manage the risks associated with the use of derivatives.

12.32 CEIOPS considers that besides the advice given on reinsurance here it would be crucial to define the criteria governing the Reinsurance Management Strategy in the form of supervisory guidance at a later stage.

12.33 The CfA clearly mentions not only reinsurance but also other risk mitigation techniques, on both the asset side and the liability side. On this basis CEIOPS will divide CEIOPS’ advice into three main parts: the first one addressing reinsurance, the second focussing on alternative risk transfer and the third concerning derivatives.

**CEIOPS’ Advice**

**Risk mitigation measurement**

*Meaning of risk mitigation (including by means of reinsurance)*

12.34 The underlying impact on risk associated with risk mitigation (reinsurance) should be treated consistently, regardless of the legal form of the protection.

12.35 The prime consideration is the extent of risk transfer. The different risk characteristics (including risks transferred and acquired) of various covers will need to be taken into account.

12.36 Terms such as 'traditional reinsurance', 'non-traditional reinsurance' and 'Alternative Risk Transfer' are not well-defined in the sense that there is no universal common understanding of their meanings; nor do
they automatically reflect the level of risk mitigation associated with products. The colloquial usage of terminology is inadequate when seeking to quantify the effects of risk mitigation, but is useful in making general distinctions between different types of reinsurance management.

**Reflection in the MCR**

12.37 In principle, the MCR should allow for the effects of risk mitigation (reinsurance). The extent to which this can be achieved in practice will depend on the functional form of the MCR.

**Reflection in the SCR**

12.38 It is essential that the determination of the SCR (by application of the SCR standard formula or otherwise) allows for the impact on an undertaking’s risk profile of risk mitigation (reinsurance).

12.39 Provided the general requirements for internal models are satisfied, there should be no further restriction on allowing for the impact of reinsurance on capital requirements when the SCR is calculated under this approach.

12.40 As an example, the answer to CfA 10 outlines a modelling approach for underwriting risk in non-life insurance using factor-based modelling, supplemented with stress tests to take account of low-frequency, high-severity events. The factors and volume measures should be adjusted to reflect the impact of risk mitigation by means of reinsurance. Stress tests should take into account the reinsurance programme of the insurance undertaking. Simultaneously, the risk of reinsurance cover failure should be reflected within the assessment of credit risk.

12.41 In principle, the determination of an equivalent to the SCR (by application of the SCR standard formula or otherwise) should also be by reference to the position of the undertaking without allowance for the impact of risk mitigation (reinsurance) on the undertaking’s risk profile. For clarity, this should be distinguished from the SCR and not be considered a solvency control level. It will be useful to supervisors in a number of areas, including in making decisions related to Pillar II.

12.42 To be capable of adequately reflecting the effects of risk mitigation, the risk measure underlying the SCR should be TailVaR.

12.43 Conceptually, the SCR should be determined by reference to the risks to which an insurer is exposed, considered at the level of the whole undertaking. Practically, in order to adequately reflect the effects of risk mitigation, to the extent that the standard formula applies by reference to some sub-division of these risks, it will be necessary for the allowance in the standard formula for the effects of risk mitigation to also apply at the same level of sub-division.
Changes in the risk mitigation programme

12.44 Conceptually, the SCR needs to allow for risks associated with the renewability of an undertaking's reinsurance programmes and for changes which may occur during the time horizon of the SCR.

12.45 For reasons of practicability, the standard formula might be developed on the assumption that an undertaking will renew on unchanged terms the risk mitigation (reinsurance) programme in force on the date of its determination to the extent it expires during the solvency assessment time horizon. However, scenario-based approaches could potentially include different assumptions on the renewability of the risk mitigation programme.

12.46 CEIOPS should attempt to include in the standard formula an allowance for the risks associated with material changes in the effect of the risk mitigation (reinsurance) programme during the time horizon of the SCR (including the impact of those changes on the distribution of assets minus liabilities at the end of the time horizon of the SCR), but this will of necessity be approximate and will need to be the subject of further analysis. The main areas to be addressed would be:

- the impact of planned changes to the existing reinsurance programme, possibly differentiating between signed agreements and those agreed in principle; and
- future renewals and changes to the programme which will be needed during the time horizon but which cannot yet be determined with any certainty.

Should this prove impractical in the context of a Pillar I calculation, then this will fall wholly to the Pillar II assessment.

12.47 If the undertaking's risk mitigation changes during the time horizon, the undertaking must monitor the impact on its SCR to ensure that it remains a sufficient reflection of its risk profile. If the changes might reasonably be expected to have a material impact on the ongoing relevance of the undertaking's SCR, a recalculation of the SCR will be necessary. This should be a requirement under Pillar I and will also have Pillar II implications.

Reinsurance risk management

12.48 Irrespective of the type of risk mitigation technique, CEIOPS does not find that the insurance undertaking should be permitted to treat contracts where there is in fact little or no significant transfer of risk as reducing capital required for the purposes of solvency, simply because such contracts are titled reinsurance. In some cases, these contracts may be financing vehicles (where funds are effectively lent by the

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114 Some CEIOPS members consider the additional complexity in the standard formula might not be justified by the additional accuracy of risk measurement.
reinsurer to the insurer), in which case they should, for the purposes of solvency, be treated as loans and not as reinsurance.\textsuperscript{115}

12.49 The Reinsurance Management should form a part of the overall risk management procedure and is a structured and documented approach that defines the strategies and policies for managing and monitoring the reinsurance arrangements of an insurance undertaking.

**Role and responsibilities of the Board of Directors and Senior Management in Reinsurance Management**

12.50 The Board of Directors\textsuperscript{116} shall approve a Reinsurance Management Strategy that is appropriate to the risk profile of the undertaking and complies with the undertaking’s underwriting, risk management and internal control systems. This strategy shall be reviewed on an annual basis or, if appropriate, more frequently, but also if the insurance undertaking’s circumstances, its underwriting policy or the status of its reinsurers changes, or whenever a review is justified.

12.51 Where an insurer is part of a wider financial group, the Board of Directors should take note of the wider group’s reinsurance strategy when determining its individual reinsurance strategy. The Board of the individual entity should pay particular attention to intra-group reinsurance arrangements that might give rise to concentration risks for that particular individual undertaking which might also affect the group situation as a whole.

12.52 The Senior Management shall notify the supervisory authority of any intra-group financial reinsurance contracts.

12.53 The Senior Management shall define the policies and operational procedures for implementing the reinsurance management strategy approved by the Board of Directors in unambiguous written form.

12.54 The Senior Management shall ensure that the terms and conditions of the reinsurance contracts comply with the relevant legislation, that reinsurance contracts represent the complete arrangement between the cedant and the reinsurer, with interdependent contracts clearly identified and no ‘side letters’, and that the contracts fully reflect all the risks that are to be covered, in order to avoid situations with:

- inadequate reinsurance cover;
- unintentionally uncovered risks; and
- risks assumed to be covered by the contracts but which, for legal

\textsuperscript{115} This is in line with, e.g., requirements of many local GAAPs as well as with those of IFRS. See also ongoing work in other areas, e.g.IAIS on Finite Reinsurance, Basel 2005, \url{www.iaisweb.org}.

\textsuperscript{116} See CEIOPS’ Answers to the European Commission to the first wave of Calls for Advice in the framework of the Solvency II project, CEIOPS-DOC-03/05, para. 32, footnote 12.
or contractual reasons, are not, in fact, covered.

12.55 The Senior Management shall ensure that an adequate and effective reporting system on the implementation, monitoring and control of the Reinsurance Strategy exists and that it fulfils the requirements established by the Board of Directors regarding frequency and level of detail.

Reinsurance management strategy

12.56 Insurance undertakings should be required to have an overall reinsurance strategy, set by the Board of Directors. The strategy should be updated as often as necessary (at least annually). The Senior Management should describe how this strategy will be implemented through a reinsurance policy, including reinsurance planning and procedures.

12.57 The reinsurance management strategy shall identify the procedures for developing and approving the reinsurance programme, the risk profile underpinning the reinsurance programme and the monitoring needed for the reinsurance programme, as well as the lines of responsibility and the controls implemented.

12.58 The reinsurance strategy's implementation carried out by the senior management should in particular identify:

- the insurance undertaking’s retention;
- all the risks to be included the reinsurance programme;
- an adequate reinsurance programme; and
- selection of appropriate reinsurers.

Reporting to Senior Management and the Board of Directors

12.59 Risk management and internal control should include procedures for reporting to the Board of Directors and the Senior Management, that describe the level of accomplishment or degree of deviation from the defined reinsurance management strategy.

Alternative Risk Transfer (ART)

12.60 From a management point of view, the differentiation between traditional, non-traditional reinsurance and ART is not clear-cut. However, from a Pillar II perspective, ART is taken to mean any transfer or assumption of risk that does not fall into the category of traditional insurance or reinsurance and may involve risk transfer to the capital markets. In this context, ART includes, for example, finite and financial reinsurance.

12.61 Insurers should be required to assess if, and to what extent, there
should be a reduction in risk regarding the calculation of the Solvency Capital Requirements. Nevertheless, the supervisory authority should have the final decision on this subject. CEIOPS at a later stage will develop principles on covers that are unconditionally admitted for solvency purposes and covers that require prior regulatory approval (e.g. innovative risk transfer structures).

**Role and responsibilities of the Board of Directors and the Senior Management in ART arrangements**

12.62 The Reinsurance Management Strategy approved by the Board of Directors should include the Board’s consent to the use of any ART products and the purpose for their use. An ART Strategy shall be part of the overall Reinsurance Management Strategy of the undertaking.

**Financial hedging through the use of derivatives**

12.63 Responsibilities of the Board of Directors and the Senior Management in this context are as follows:

- approving clear and precise written strategies and policies on derivatives. These should specify, in particular, the limits, which types of derivative products may be used, for which purposes, under which conditions, in which markets, as well as specify lines of responsibility within the undertaking in this context, for the purpose of risk mitigation (or increase risk diversification), or for the purposes of efficient portfolio management, not simply in order to increase returns;

- approving the underlying risk management principles, whereby the corresponding strategy must be periodically re-evaluated, at least on an annual basis;

- ensuring that periodic reports are produced assessing the degree of compliance with the written strategies and policies and the scale of risks assumed, and that they are prepared by an internal or external entity, independent of the entity that in practice executes the investment policy of the insurance undertaking;

- ensuring that the functions which are directly responsible for implementing the derivatives policy have sufficient experience and knowledge regarding this type of operation and the inherent associated risks.

12.64 The policy for the use of derivatives should be consistent with the insurer's activities, its overall strategic investment policy and the asset/liability management strategy, as well as its risk tolerance.

12.65 Risk management must cover the risks associated with derivatives activities to ensure that the risks arising from all derivative transactions undertaken by the insurer can be:
• analysed and monitored individually and in aggregate;
• monitored and managed in an integrated manner with similar risks arising from non-derivative activities so that exposures can be regularly assessed on a consolidated basis.
Call for Advice No. 13

Quantitative Impact Study and data related issues

Extract from the Call for Advice:

This Call for Advice will require careful planning and effective execution as it is very challenging from technical, resource and timing points of views. The following issues have to be addressed while opting for the most appropriate solutions:

- Data definitions
- Data requirements and collection (having regard to present differences in asset liability valuation) and standardised reporting
- Comparability and quality data – acceptable approximation
- Sample sizes
- Scenarios to be tested
- Organization of work, co-operation issues
- Planning for progressively more sophisticated and comprehensive approaches to field testing
- Specific implementation issues concerning SMEs
- Analysis of possible procyclical effects and measures to reduce them (e.g. how to build buffers over and above the required amount of SCR, cf. the solvency control level Call for Advice)

The objective is to assess the economic consequences of the Solvency II project in the EU, including the impact on the insurance industry (cost of capital, cost-benefit analysis, international competitiveness), the financial markets (market efficiency, systemic risk etc.) and the policyholders (cost-benefit analysis – especially regarding different confidence levels and time horizon assumptions, implications on product availability and prices).

The Commission Services request CEIOPS to contribute to the organization, coordination and performance of the simulations so that the set time goals can be respected. These quantitative impact studies should include analysis and guidance on SMEs and procyclicality issues (these areas will be addressed by separate Specific Calls for Advice still to be issued).
Background

13.1 The Commission Services has envisaged that a series of quantitative impact studies (QIS) will be needed throughout the Solvency II project. This will also be an input for the Impact Assessment that the Commission has to provide when proposing a Framework Directive. The Impact Assessment will consider the wider macroeconomic consequences of Solvency II. QIS will test the impact of proposed principles with respect to the financial resources of individual insurance undertakings. As the QIS is very challenging from a technical, resource and timing point of view, careful planning and effective execution is required. This is reflected by the planning embedded in this response to CfA 13.

13.2 The Commission Services request CEIOPS to contribute to the organisation, coordination and performance of the simulations so that the set time goals can be respected.

13.3 The first piece of advice explaining the preparations made and the plans for the execution of the first round of quantitative impact studies should be transmitted by 31 October 2005.

Explanatory text

Guiding principles

13.4 This answer to the CfA on QIS and data related issues mainly focuses on the organizational aspect related to QIS exercise to be developed by CEIOPS. For this reason the response makes reference to the internal CEIOPS organisation. This response is based on the following four guiding principles:

- the allocation of responsibilities within CEIOPS’ organization for carrying out QIS and preparing CEIOPS Members’ resolution provides that the Pillar I Working Group is responsible for developing quantitative requirements;

- the Financial Stability Committee (CEIOPS FSC) is responsible for the testing of (components of) these requirements;

- the testing will be carried out through QIS. The QIS process will have several iterations with progressively more sophisticated and comprehensive approaches as quantitative requirements are developed in more detail. In principle, the first QIS will primarily focus on the level of prudence in technical provisions, while later versions (in 2006 and beyond) will also include the minimum capital requirement (MCR) and components for the standard formula of the solvency capital requirement (SCR). The concrete elements to be tested in each round will depend on the progress made in the context of the Pillar I analysis;
the process of conducting a QIS and processing a result is estimated to take approximately 5 to 6 months from the point in time where all necessary input is received; and

the Preparatory Field Study (PFS) which has been carried out in the first half of 2005 on selected life insurance undertakings is not representative for the QIS.

13.5 This response describes the preparations made for conducting QIS of the Solvency II proposals. CEIOPS has identified the following areas as important to incorporate in the plan for the first round of QIS:

- experience from the PFS;
- organisation of work;
- scope, data and scenario analysis;
- sample sizes;
- timing issues; and
- planning for progressively more sophisticated and comprehensive approaches to field testing.

13.6 The challenges from a technical, resource and timing point of view will be considered in this response. The response primarily focuses on the responsibilities of the CEIOPS FSC in carrying out the QIS. It does not deal with the methodological issues related to the content of the solvency proposals, but is based on the assumption that all necessary input for developing a testable framework will be provided by the Solvency II Working Groups, especially the Pillar I Working Group, consistent with the answers of CfAs 7-10.

**Experience from the PFS**

13.7 During spring 2005 CEIOPS conducted a PFS on selected life insurance undertakings. The following results can be noted. First, the PFS resulted in an extensive list of practical issues with respect to realistic valuation as well as other issues, which list will be considered by CEIOPS in its further technical work. Guidance with respect to market consistent valuation of assets and, in particular, liabilities, seems urgent. With respect to quantitative issues, the following results can be derived. First, transition from current to market consistent valuation may generally lead to a slight reduction of liabilities; however there is a large dispersion between countries and undertakings. It should however be noted that in most cases no risk margin had been included yet. It was also noted that embedded options have been taken into account by only a few undertakings, yet an increasing tendency to value them can be perceived. Moreover it turned out that some countries do not value their assets in a market consistent way. In these
cases, transition to market consistent valuation may lead to an increase of the value of assets. The stress tests conducted in the PFS indicate that equity risk and interest rate risk are in general the most important risk factors. Other risk factors seemed less material, however anticipation on this might induce incentive effects with the insurance undertakings. Finally, it appeared that upfront the ultimate impact of the valuation changes combined with the solvency effect on financial resources of an individual undertaking is hard to predict.

13.8 CEIOPS has published high-level results from the PFS in a report (CEIOPS-FS-08/05 S117).

Organisation

13.9 Conducting the QIS requires that the necessary expertise and technical resources are available. CEIOPS has created, within the CEIOPS FSC, a task force on QIS consisting of 5 members. The main assignments of this task force are to create the QIS framework (spreadsheets and guidance), to set up a format for country reports, to take account of questions and answers during the process, and to consolidate the country results and conduct certain calculations at a European level. The division of labour between the task force and the main CEIOPS FSC is clearly defined. The QIS task force does the operational work concerning the QIS. The CEIOPS FSC, which is open to all Member States, remains the forum in which information is exchanged and discussed and where the views of the Member States are represented. The moderator of the task force reports to the full CEIOPS FSC; the chair of the CEIOPS FSC reports to the CEIOPS Members and its Managing Board.

13.10 In order to ensure that the QIS framework is adequate, the CEIOPS FSC has decided to include a pre-test phase before every round of QIS, carried out with a small sub-sample of insurers in each country.

13.11 The QIS process involves at least the work streams mentioned below:

- selecting the insurance undertakings for participation in pre-test of QIS and QIS (by national supervisors);
- drawing up spreadsheets based on input from the Pillar I Working Group and drafting guidance to the spreadsheets (by CEIOPS);
- carrying out the pre-test in all countries (by national supervisors, participating insurance undertakings, and CEIOPS);
- amendments of spreadsheets and guidance based on experience from the pre-test (by CEIOPS);
- carrying out the QIS calculations in the spreadsheets (by participating insurance undertakings);

117 Available at CEIOPS’ website: www.ceiops.org.
• handling questions from insurance undertakings and supervisors during the process of filling in the spreadsheets (by national supervisors and CEIOPS);

• communicating the answers given by national supervisors and CEIOPS to all participants in order to streamline the process and increase comparability, drawing on industry initiatives where appropriate (by national supervisors and CEIOPS). To that end a Q&A database to be published on the CEIOPS website is created.

• validating and checking the spreadsheets filled in by insurance undertakings (by national supervisors);

• drawing up country reports (by national supervisors);

• summarising conclusions from country reports (by CEIOPS); and

• consulting on any changes or additions to the advice already submitted to the EU Commission (by CEIOPS).

13.12 Cooperation with the industry is essential for a successful QIS process. To that extent there needs to be a close liaison between the national supervisor and the insurance undertakings as well as the insurance associations. The scope of the cooperation on the national level between supervisors and insurance associations is decided by the individual national supervisor. On the national level the insurance associations may assist by informing their members about the importance of QIS work and by encouraging their members to participate in the QIS. Some national supervisors may also want support from the national insurance associations in handling questions from insurance undertakings. Finally, the associations and/or the participating undertakings may give advice on the spreadsheets and guidance especially during the pre-test stage.

13.13 On a European level CEIOPS will also liaise with European industry associations where such liaison is deemed instrumental for a smooth information exchange on infrastructural issues and general observations on the set-up of the QIS. Such a liaison should never interfere with the national supervisors’ responsibilities with respect to selecting and approaching participating insurers as well as consolidating and transferring the country-specific results to CEIOPS.

Scope, Data and Scenario Analysis

13.14 The first step in preparing for the calculations of the QIS is to determine the exact scope of the QIS. It should be as clear as possible what the QIS is attempting to quantify including calibration issues. In order to avoid unnecessary burden on participating undertakings whose
assistance is much appreciated, the focus of QIS will be on the most critical areas.

13.15 Agreeing on data definitions, along with the valuation, methodology and assumptions to be applied, will be important in order to achieve an acceptable degree of comparability. In this respect, it appeared from the PFS that guidance is needed on the classification and inclusion of financial instruments, valuation techniques, and on the level of prudence (risk margin). The PFS has resulted in an extensive list of practical issues, which will be considered by CEIOPS in its further technical work.

13.16 In order to develop spreadsheets and write guidance for the various QIS, the CEIOPS FSC task force will depend on input from other CEIOPS Working Groups, especially the Pillar I Working Group. The aspects which may need to be considered include:

- definitions/guidance to the valuation of assets;
- definitions/guidance to the valuation of technical provisions for life and non-life including general principle (e.g. best estimate plus risk margin), a definition of when an insurance benefit is guaranteed and when it should be classified as an option, a definition of risk margins (e.g. market value margin), interest rate term structures etc.;
- impact of reinsurance;
- segmentation and classification of risks;
- definitions of insurance classes (life, non-life);
- definitions of long tailed risks and low frequency risks;
- confidence levels; and
- assumptions concerning policy holders use of options.

13.17 Scenario analysis may be a central part of the Solvency II framework. Stress tests may, therefore, be needed to calculate the impact of a set of single events or a combination of single events. The PFS for life insurance undertakings included stress tests of interest rate risk, credit risk, market risk, underwriting risk and lapse risk. Stress tests and/or scenario analysis to be used in the QIS might include other risks such as expense risk, ALM risk etc. as they will be closely related to the draft Framework Directive.

**Sample sizes**

13.18 Samples should be sufficiently large and varied (size and type of business of undertakings participating) to give a fairly accurate picture of the quantitative impact of the Solvency II proposals in the individual
member countries and in the EU as a whole. The CEIOPS FSC will draw up guidelines for sampling in individual member countries for QIS2. These guidelines will be principle-based (such as significant representation, variety) and allow for the possibility to align the samples with the particularities of the national markets.

13.19 While participating in a QIS exercise is optional for any undertaking, all undertakings wishing to participate should have the possibility to do so. CEIOPS takes the view that taking part in QIS will give insurers the opportunity to contribute in shaping the subsequent technical advice that CEIOPS gives the EU Commission, particularly because QIS will allow a dialogue with insurers and associations about the practicalities of the approaches envisaged. Coverage of the samples will probably be a lesser issue in the subsequent QIS exercises than in the first as the interest in participation is expected to increase.

13.20 The participation in the QIS of undertakings belonging to groups operating in more than one European country should be coordinated between the national supervisors concerned.

Timing issues

13.21 Timing issues are clearly a challenge to the process of carrying out the QIS. The process of conducting a QIS and processing a result is estimated to take approximately 5 to 6 months from the point in time where all necessary input is received

- drafting of spreadsheets & guidance (2 -3 weeks);
- conducting a pre-test and amending the framework (4 weeks);
- QIS calculations (the undertakings should be allowed at least 8 weeks and up to 12 weeks for the initial QIS);
- validating and checking spreadsheets and preparing country reports (4 weeks);
- summarising conclusions from country reports (3-4 weeks); and
- consultation on changes or additions to the advice previously submitted to the EU Commission will follow the timeframes outlined in CEIOPS' statement on Consultative practices.

13.22 It is recognised that this timeframe is ambitious and may have to be extended in light of the experience. QIS will need to be undertaken on a best effort basis in order to provide timely input to the Commission’s impact assessment of the Framework Directive.

13.23 Furthermore the end-of-year issue is taken into account. The key consideration is existing reporting considerations – most undertakings will be very busy with end-year reporting in the first quarter. It is
therefore not feasible to ask the insurance undertakings to conduct QIS calculations during the first 3 months of a year.

13.24 According to the current version of the Solvency II Roadmap (Annex to MARKT/2502/05-rev. 1) the European Commission will conduct an impact assessment to be presented July 2007. CEIOPS will contribute to this impact assessment by providing greater clarity on the implicit prudence embedded in the current level of technical provisions, together with assessing the impact of its advice on technical provisions and capital requirements under Solvency II. To this extent, it will organize a limited QIS1 exercise during the fourth quarter of 2005 that will be primarily focussed on testing the various confidence levels with respect to the determination of the proposed risk margin surrounding the best estimate of the insurers’ liabilities. From the PFS the valuation of insurance liabilities appeared to be one of the central elements when striving for greater harmonisation of prudence levels requested under Solvency II. In this context, QIS 1 will test the 75th and 90th percentile, as well as inviting firms to bring the 60th percentile and/or alternative approaches (such as the cost of capital approach) to CEIOPS’ attention. Simultaneously, the Pillar I Working Group will work on further refinements of the MCR and SCR formulas, which would allow the CEIOPS FSC to conduct its first full-blown QIS (QIS2) exercise e.g. on technical provisions, MCR and SCR during the second quarter of 2006. CEIOPS envisages that there will still be different options for technical provisions to be tested under QIS2.

Planning for progressively more sophisticated and comprehensive approaches to field testing.

13.25 Throughout the entire Solvency II project (e.g. up to and beyond the presentation of the Directive in July 2007) a series of QIS is foreseen. The QIS process will thus have several iterations with progressively more sophisticated and comprehensive approaches. Input for more sophisticated assumptions to be included in the subsequent QIS will come as progress is achieved by the Solvency II Working Groups. Aside from the impact of the minimum and solvency capital requirements on European insurance undertakings, CEIOPS may contribute to the EU Commission’s Impact Assessment by addressing broader economic consequences of the overall Solvency II project as well as cost-benefit analyses of all waves under work.

CEIOPS’ Advice

13.26 QIS will test the impact of proposed principles with respect to the financial resources of individual insurance undertakings. As the QIS is very challenging from a technical, resource and timing point of view, it will require careful planning and effective execution.

13.27 The QIS process is expected to have several iterations with progressively more sophisticated and comprehensive approaches as quantitative requirements are developed in more detail (e.g., further
components of the standard formula). In order to ensure that the QIS framework is adequate, it has been decided to include a pre-test phase carried out with a small sub-sample of insurers in each country.

### 13.28
The QIS process will involve a series of work streams, which are partly the responsibility of CEIOPS and partly of the national supervisor. The first step in preparing for the calculations of the QIS is to determine the exact scope of the QIS compared to the Impact Assessment. It should be as clear as possible what the QIS is attempting to quantify including calibration issues. Agreeing on data definitions will also be important in order to achieve an acceptable degree of harmonisation.

### 13.29
Samples of insurance undertakings participating in QIS should be sufficiently large and varied (size and type of business, complexity of products and used financial instruments of undertakings participating) to give a fairly accurate picture of the quantitative impact of the Solvency II proposals in the individual member countries and in the EU as a whole.

### 13.30
While participating in a QIS exercise is optional for any undertaking, all undertakings wishing to participate should have the possibility to do so. CEIOPS takes the view that taking part in QIS will give insurers the opportunity to contribute in shaping the subsequent technical advice that CEIOPS gives the EU Commission, particularly because QIS will allow a dialogue with insurers and associations about the practicalities of the approaches envisaged.
Powers of the supervisory authorities

Extract from the Call for Advice:

The Sharma report indicated that it would be beneficial to the prudential supervisory process to include some principles concerning the supervisory authorities' powers in the Directive. A preliminary consultation (document MARKT/2502/04) showed that most Member States (as well industry) were in favour of a more detailed description of these supervisory powers through a specific article in the Framework Directive. Some commentators mentioned the need to adjust powers to the new Solvency framework by mentioning explicitly risk management, internal models and the possibility for the supervisor to add supplementary capital requirements. However, the legal implications of drawing up a detailed list of supervisory powers remains an open question: while some Member States feel that it would help supervisors in court proceedings, others fear that increasing the level of detail may reduce their powers - because powers not explicitly detailed in the Framework Directive may be considered as excluded. A possible solution could be to have, in addition to the articles of the Directive which make reference to specific powers, a general enabling article and include in implementing measures more detailed elements such as the conditions under which such powers can be exercised. These powers should be exercised transparently, within appropriate limits and subject to appropriate procedures.

A possible solution could be to define a general enabling article, in addition to the articles of the directive which set out specific powers, and to include more detailed elements for implementing measures, such as the conditions under which such powers can be exercised. These powers should be exercised transparently, within appropriate limits and subject to appropriate procedures.
14.1 Current insurance Directives confer certain powers on supervisory authorities. These powers can be divided into four categories: specific powers related to specific procedures in the lifespan of an insurance undertaking, general powers, powers linked to the main objects of supervision, and intervention powers (if policyholders’ rights are threatened or if an undertaking fails to comply with its obligations).

14.2 By stepping up the onus on the undertakings to know and manage their risks, the new risk-based solvency system will increase the complexity of supervision. In this context, CEIOPS is invited to advise on a new definition of supervisors’ powers. Bearing in mind that one of the objectives is to increase harmonisation, this advice should at least take into account the following elements:

Powers that may need to be made explicit:

- General power to obtain all relevant information from the insurance undertaking, in particular concerning risk management and internal models, including third parties to whom an insurance undertaking has outsourced key activities.

- General power to investigate, including third parties to whom an insurance undertaking has outsourced key activities.

- Power to increase capital requirements under certain circumstances.

- Circumstances in which these powers can be used (this links into Solvency control levels)

14.3 Where appropriate, the subject over whom the powers are exercised should have the right to appeal to suitable judicial authorities.

14.4 Supervisory authorities’ powers will need to be reviewed and adjusted in the new Solvency II framework, particularly those powers concerning risk management and internal control issues and the possibility for the supervisor to require undertakings to hold supplementary capital.

14.5 It is crucial that all supervisory powers, including any possible new ones, will be exercised transparently, within appropriate limits and subject to normal supervisory processes (“due process”).

14.6 The appropriate use of powers concerning prudential issues must be complemented by requirements of independence and accountability of the insurance supervisory authorities.

14.7 Most supervisory powers are powers to require the insurance undertaking to do or not do certain things. Achieving a harmonised minimum set of supervisory powers is contingent on insurance
undertakings themselves being permitted to do the required things, which, in turn, depends on the actions permitted by corporate legislation in each Member State. The corporate law in some States, for instance, permits undertakings to propose compromises with their creditors with the result that if a certain majority of creditors agrees, the proposals are binding for all creditors. This can be a useful restructuring tool if an insurance undertaking is in financial difficulties and the optimum solution is for policyholders to agree to be paid less than the full value of their insurance policy. So, whilst supervisors can urge insurers to propose such compromises in some States, turning that to a general ‘power’ throughout the EU is not possible as it would not be feasible in other States where company law does not enable insurers to propose such compromises. The Commission may wish to consider the extent to which such powers should be harmonised where changes would be required to company law in the Community.

14.8 In general, CEIOPS aims for a high level of convergence. In order to avoid supervisory arbitrage, Member States should be provided with a common set of supervisory powers, based on the existing powers that have been appropriately reviewed, refined and extended to cover new powers. Supervisory powers should in general be exercised in accordance with all laws applicable to an insurance undertaking, including national and international data protection laws and company laws.

14.9 Should additional powers be granted to supervisory authorities, Member States should not be forced to abolish their existing additional powers if this compromises the attainment of their national supervisory objectives, which should be compatible with the aim of Solvency II creating an appropriately harmonised framework.

14.10 CEIOPS notes that as a part of the Supervisory Review Process competent authorities are expected to assess the risk profiles of a large number of undertakings using the SCR standard model. In this respect the future Solvency II Framework is likely to put additional demands on the resources of supervisory authorities.

14.11 The new framework will establish a number of new requirements of the undertakings (i.e. CfA 1 on risk management and internal control). Similarly, a risk-based approach to supervision entails that supervisory authorities, in fulfilling their obligations to conduct both legal and financial supervision (on-site as well as off-site) must cover a greater number of issues than under the current regime. Article 10 of the Recast Life Directive establishes that financial supervision shall include verification, across the entire scope of the assurance undertaking’s business, of its state of solvency, of the establishment of technical provisions, including mathematical provisions, and of the assets covering them, in accordance with the rules laid down or practices followed in the home Member State pursuant to the provisions adopted at Community level. However, Article 10 only addresses the financial supervision rather than the legal supervision. Hence, it is necessary that the future Framework Directive includes provisions covering both financial and legal supervision.
14.12 In order to help supervisors in court proceedings and to make the Lamfalussy process more operational, CEIOPS deems it necessary to include a general enabling article in the Framework Directive and complement this article with a non-exhaustive list of specific powers in the possible implementing measures.

14.13 The Working Group discussions have established that several CEIOPS members were in favour of acquiring specific powers relating to the disclosure of measures taken against individual undertakings, either by publishing them in an official journal or by requesting that the Board of Directors or Senior Management disclose them to shareholders, as well as to policyholders. Other Member States were concerned that such measures would not be compatible with requirements on data protection, which could lead to legal obstacles in implementing these requirements in national law. Furthermore, although ‘naming and shaming’ can be very effective in seeking compliance, it may also have negative repercussions, especially in small markets. The possible impact on policyholders’ interests should also be taken into consideration. The disclosure of measures could further aggravate procyclical effects and exacerbate already critical economic situations.

14.14 Supervisory authorities should have the power to demand that undertakings inform supervisory authorities immediately if solvency control levels are breached or if undertakings expect them to be breached. This reporting obligation should also apply to persons in key functions and to an insurer’s external auditors, though with the provision that notification by the undertaking itself is adequate. The purpose of this is to provide for an additional “whistle-blowing” opportunity if the insurer fails to make the notification.

14.15 CEIOPS will address the issue of allocation of supervisory responsibilities and supervisory instruments and powers of intervention within a group context in more detail in its response to the CfA 20 (Co-operation between Supervisory Authorities).

**CEIOPS’ Advice**

**General**

14.16 CEIOPS agrees with the Commission Services that the Framework Directive should include a general enabling article on supervisory powers and complement this article by a non-exhaustive list of specific powers in the possible implementing measures.

14.17 In general, all the necessary powers mentioned in the Framework Directive and any future implementing measures shall be addressed in a way that enables the supervisory authority to
• protect policyholders’ and beneficiaries’ interests;
• monitor the solvency of insurance undertakings; and
• enforce European and national specific regulations.

14.18 The powers are the tools of the supervisory authority to implement the Supervisory Review Process as an on-going process, i.e. it includes the powers in implementing it and the measures that can be taken as a result of it. As outlined in the answer to CfA 2 supervision should include both quantitative and qualitative elements, and should be conducted both off-site and on-site as appropriate.

14.19 Consequently the supervisory authorities should have the power to do both full-scale and focused on-site inspections.

14.20 Member States should not be forced to abolish existing additional powers, if this compromises the attainment of their national supervisory objectives.

14.21 CEIOPS regards the following aspects as necessary for a common set of supervisory powers:

**Gathering information**

14.22 Supervisory authorities must have direct access to any information available to the insurer about its own position.

14.23 Supervisory authorities should have the power to request that undertakings collect any and all appropriate information, in particular regarding the risks that are not fully covered by Pillar I requirements. Information on the system of governance, internal control and risk management policies, strategies and processes should be made available to the supervisory authority.

14.24 In order to better assess and control the situation in an insurance undertaking, the supervisor should be able to intensify supervisory activity and to give detailed guidance; to require an undertaking to appoint an independent party acceptable to the supervisor to provide a report prescribed by the supervisor; to require the undertaking to extend the scope of internal or external auditors’ or consultants’ work (at company’s cost), and for the professionals engaged to be required to report directly to the supervisory authority. Further activities can include requesting additional stress testing and scenario analysis, providing recommendations to actuaries to review actuarial assumptions according to the circumstances, commissioning independent actuarial reviews, and applying prudential limits and restrictions more rigorously.

14.25 Furthermore, supervisors should have access to additional information concerning the solo undertaking from the parent undertaking of a group, or from other group entities. CEIOPS has further elaborated on the supervision of groups and on the Supervisory Review Process for
groups in its answer to CfA 18, and with regard to cross-border business, in its draft answer to CfA 20.

14.26 CEIOPS recommends that the future Framework Directive includes provisions similar to the current Article 13 of the Recast Life Directive which establishes, among other, that the competent authorities shall provide each other with any documents and information that may be useful for the purposes of supervision, as well as a general competency of the supervisory authorities to carry out on-the-spot, ad-hoc investigations.

Compliance with legislation

14.27 Supervisory authorities should be able to assess the degree to which each insurance undertaking complies with the legislation and/or applicable regulations. Among other things, it should be able to:

- check whether insurance legislation is correctly applied by insurance undertakings;
- initiate measures designed to prevent a breach of legislation and/or regulation; and
- promptly and effectively deal with non-compliance.

14.28 Supervisory authorities should be able to take action against those individuals or entities that are operating an insurance business without a license.

Supervisory Review Process

- Financial Requirements

14.29 Supervisory authorities should have the power to assess insurers’ financial position, the proper use of assets to cover their technical provisions and the adequacy of the solvency capital requirement, with respect to the risk profile of the undertaking.

14.30 The supervisory authority must assess the risk profile of an undertaking in order to evaluate the level of the adequacy of the solvency capital requirement. If the supervisory authority concludes that the solvency capital requirement does not match the risk profile of that undertaking, either because there are risks that are not captured by Pillar I calculation or because they are captured insufficiently, the supervisor should be able to:

- require the undertaking to hold more capital against its existing risks;
- require the undertaking to take no additional risks or to reduce its overall level of risk retained.

14.31 Supervisory authorities should have the option, either in conjunction
with the two measures above or independent of them, to instruct undertakings to set up and implement partial or full internal models if the actual risk situation deviates substantially from the assumptions underlying the standard formula. This particular power should be used with particular care.

14.32 Supervisors should have the power to either reject the actuarial model, require improvement or require the undertaking to calculate and apply a recalibration factor. CEIOPS will consider whether and how such a recalibration factor could be estimated in a reliable and consistent manner. Increase an undertaking's SCR estimate mechanismically using a recalibration factor to ensure it is consistent with the prudential objectives for the SCR under Pillar I. Supervisors may also impose a period of 'parallel running' to compare the results generated by the internal model with the standard formula. A descending floor might be used to ensure that the transition to internal models for the SCR calculation does not result in sudden, extreme changes in regulatory requirements.

14.33 If there is reason to believe that the solvency position is in jeopardy, supervisory authorities should have the power to take preventive measures, in concordance with the solvency control levels.

14.34 The 'preventive measures toolkit' available to supervisors (see also CfA 15) should at least include the following general powers, some of which are already included in the acquis:

- require the insurer to develop an acceptable plan for correcting problems (corrective plans include agreed and acceptable steps to be taken to resolve the issues raised within an agreed timetable);
- require that technical provisions be increased or/and provisioning procedures be revised;
- refuse, delay or impose conditions on requests or applications submitted for regulatory approval, such as innovative capital instruments, acquisitions and redemptions, or the repurchase of equity;
- limit business expansion (premium volume limitations);
- restrict asset transfers;
- restrict an insurer’s purchase of its own shares and restrict payments or asset transfers to an insurer’s subsidiary;
- initiate action to restrict ownership or activities of a subsidiary where, in the opinion of the supervisor, such activities jeopardise the financial situation of the insurer;
- prevent the insurer from issuing new policies or accepting new business within existing policies, provided that contractual obligations to the policyholder to accept such business are not
affected;

- Impose restrictions on certain types of business or investment;
- Impose restrictions on acquisitions; and
- Review reinsurance arrangements.

14.35 If the solvency capital is identified by the supervisory authority as being insufficient, the authority should be empowered to request the undertaking to directly address the problem and to immediately execute any measures deemed necessary by the supervisor. This could be done by:

- requesting the undertaking to restore capital to adequate levels and to submit a revised business plan for restoring solvency levels;
- inhibiting the undertaking from assuming any new risk of any kind;
- limiting the redemption/repurchase of equity instruments; and
- limiting dividend payments, depending on the level of solvency control that is breached.

14.36 In order to evaluate the effectiveness of the stress tests performed by the undertaking, supervisory authorities should have the power to:

- request the results from key stress tests and the underlying critical assumptions;
- access full details of the assumptions and methodologies used by the insurer in stress testing; and
- assess the insurers’ response if stress-testing results indicate an increased risk profile.

14.37 Supervisory authorities should also have the power to:

- prescribe standard tests that support the supervisor in benchmarking and comparative analyses, enabling the supervisor to quickly identify which insurers are likely to be affected by a major risk event, such as a natural disaster or the failure of a major reinsurer;
- require the insurer to perform additional stress-testing, to provide both the insurer and the supervisor with a more complete understanding of the situation; and
- establish the requirements for stress-testing to ensure prudent risk management by the insurer, e.g. the nature and minimum frequency of such tests.

14.38 Supervisory authorities should have the power to impose further
corrective and ultimate measures once the preventive and corrective measures have been performed, if the interests of policyholders are still compromised.

- **Governance**

14.39 Supervisory authorities should have effective powers to address management problems, including limiting the power of controlling owners, Board of Directors, and Senior Management, demanding their replacement or having their powers restricted (see fit and proper powers), in situations where the governance of an undertaking is considered to be demonstrably unsatisfactory for the prudent running of the undertaking, regardless of the legal form.

14.40 Supervisory authorities should have the power to request that the governance system, and the policies, strategies and procedures relating to internal control and risk management systems be improved and strengthened.

14.41 In addition to the powers described above, supervisory authorities should be able to simultaneously demand an increase in the solvency capital requirement if it concludes that the existing governance system, and the policies, strategies and procedures relating to internal control and risk management increase the risk profile of the undertaking.

14.42 With regard to fit and proper issues, supervisory authorities should have the power to:

- prevent the appointment by the insurer of a particular individual to a key function;

- suspend an individual from a key position, or withdraw the approval of an individual to hold key positions, if concluded not fit or proper by the supervisor, either directly or by instructing the insurer to take these measures;\(^\text{118}\)

- require the insurer to appoint such individuals as are necessary to strengthen key functions in order to ensure the sound and proper management and control at the insurer;

- require the insurer to engage a person with appropriate expertise and skills, nominated by the supervisor, to investigate any aspect of the insurer’s affairs that may be of concern to the supervisory authority and to prepare a corresponding report for the supervisory authority. The insurer is to bear the cost of that investigation and report;

- withdraw the license, especially in the case of a major breach (either in terms of the degree of the breach or of the number of key functionaries involved) of fit and proper requirements.

\(^\text{118}\) A minority of CEIOPS’ members do not wish to see this requirement in the future framework.
Regarding the actuarial function, supervisory authorities should have the power to:

- ask the insurer to disclose the actuarial resources employed, so that they can assess the degree of reliance that should be placed on the actuary’s work;
- remove the responsible actuary (if appointed by the insurer) if the actuary fails to perform the required functions and duties adequately or does not fulfil eligibility or fit and proper criteria.119
- be promptly informed in cases where the insurer removes its responsible actuary;
- be able to address any concerns that may arise when an insurer removes a responsible actuary in an attempt to undermine the role of the actuary or the actuary’s advice; and
- provide a legislative duty for the actuary to report to the supervisor in circumstances where the actuary considers that policyholders’ rights are threatened or the financial condition of the insurer may be jeopardised.

**Market Conduct**

14.44 Supervisory authorities should have the power to assess the level of compliance with the market conduct requirements in order to assess any effect on the risk profile of the undertaking. This power must apply, wherever necessary, to insurance intermediaries.

14.45 In addition to the powers described above, supervisory authorities should be able to simultaneously demand an increase in the solvency capital requirement if it identifies a clear failure in terms of market conduct, which may impact the solvency position of the insurer.

14.46 Supervisory authorities should have the power to publish the measures adopted, either in an official journal or by requesting that the Board of Directors or Senior Management disclose them to the owners and the policyholders, as well as beneficiaries. CEIOPS believes that before disclosing sensitive issues the possible impact on policyholders’ interests should also be taken into account.

**Principles underpinning the use of preventive measures**

14.47 Supervisory authorities should take preventive measures which are timely, suitable and necessary to achieve the objectives of supervision.

14.48 Preventive and corrective measures should be taken if an insurer fails

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119 A minority of CEIOPS’ members do not wish to see this requirement in the future framework.

120 CEIOPS-CP-06/05, available on CEIOPS’ website: www.ceiops.org.
to operate in a manner that is consistent with sound business practices or regulatory requirements. Supervisors should assess whether the failures are material and the preventive and corrective measures should be appropriate to the extent of the risk posed.

14.49 The preventive measures regarding solvency capital should be in line with the response to the CfA 15 on Solvency Control Levels.

**Principles underpinning the use of remedial/corrective measures**

14.50 Supervisory authorities should take immediate action or implement remedial measures if the application of preventive measures has not prevented a situation from worsening or if the insurer’s management has ignored requests from the supervisory authority to take corrective action.

14.51 Supervisory authorities enforce corrective action and, where needed, impose remedial action based on clear, objective and publicly disclosed criteria. The process of applying remedial action should not delay the processing and enforcement of necessary preventive and corrective measures.

14.52 The process of applying preventive and corrective measures should not delay the enforcement of necessary remedial action.

14.53 Remedial and corrective measures may include taking control of the insurer, or petitioning for the appointment of other specified officials or administrators for the task (e.g. trustees) and to make such arrangements for the benefit of the policyholders and beneficiaries as necessary, for example to require a plan for the rapid restoration of a sound financial position. This power should be exercisable in circumstances both where the insurer is in financial difficulties and where it has become insolvent (see also CfA 15). CEIOPS is aware that this power is currently not admitted under national corporate laws of all Member States.

14.54 Supervisory authorities should have the power to issue formal directions to companies to take particular actions or to desist from taking particular actions. Failure to comply with a formal direction issued by supervisory authorities may trigger any of the responses listed below (see also CfA 15).

**Ultimate actions**

14.55 Supervisory authorities should take ultimate action if an undertaking breaches the MCR.

14.56 Ultimate actions are (see also CfA 15):

(1) either to withdraw the undertaking’s license:
   - to permanently and irreversibly prevent new business and run-
off all contracts;

- to facilitate a transfer (if necessary in some Member States a compulsory transfer) of the portfolio and policy obligations of a failing insurer to another insurer who is willing to accept this transfer;

(2) or to petition for the insurer to be wound up; or, if allowed by the national corporate law, to petition for a reduction in the insurers’ liabilities under its insurance contracts as an alternative to winding-up, or to promote a scheme of arrangement whereby policyholders agree to compromise, commute, buy back or otherwise accept reduced benefits under their insurance contracts.

Powers of the supervisory authorities over third parties to whom an insurance undertaking has outsourced key activities

14.57 Supervisory authorities should have the power to:

- obtain all material information from relevant third parties, especially to obtain information from insurance or reinsurance undertakings from whom or to whom the undertaking has ceded business, and from all persons who have had dealings with the insurance undertaking or which have or might reasonably be expected to have information as to the insurance undertakings’ affairs;

- extend on-site inspections to obtain information from intermediaries and companies that are exercising outsourced functions on behalf of the insurance undertaking;

- demand oversight and clear accountability for all outsourced functions at least equal to the level achieved if the functions were performed internally and subject to the normal standards for internal controls;

CEIOPS is aware that supervisory powers should in general be exercised in accordance with all laws applicable to an insurance undertaking, including national and international data protection laws and company laws.

Reporting powers

14.58 Supervisory authorities should have the power to demand that undertakings inform supervisory authorities immediately if solvency control levels are breached or if undertakings expect them to be breached. This reporting obligation should also apply to persons in key functions and to an insurer’s external auditors, though with the proviso that notification by the undertaking itself is adequate. Further requirements will be outlined in the answer to the CfA 21 on
Supervisory Reporting<sup>120</sup>. 
**Solvency control levels**

*Extract from the Call for Advice:*

In Solvency II, ‘solvency’ is viewed in the widest sense, including not only the available capital but also the coverage of liabilities by admissible assets and off-balance sheet items. So, 'solvency' concerns the whole financial position and is not merely restricted to the available capital. Supervisors safeguard the interests of the policyholders and must therefore be aware when there is a growing threat to the insurer’s solvency. Effective supervisory action is enhanced by the establishment of solvency control levels.

A crucial element in fixing the number and level of the control levels will be the actions taken when they are breached. The consequences of breaching a control level will differ according to the gravity and speed of deterioration. Breaching the highest capital control level could entail actions which are widely left to the judgement of the supervisor (principles-based approach) while breaching the MCR or the coverage control level should bring about prompt and severe sanctions (rules-based approach). Note that the minimum guarantee fund will be replaced by an absolute minimum requirement (i.e. the MCR will be calculated according to a formula, with an absolute floor).

... The Commission Services suggest considering additional control levels, playing different roles:

- an early warning indication of the deterioration of the insurers’ financial situation...

- a level calibrated on a longer time horizon than the one assumed in the SCR calculation: its level would then depend on a long-term plan and long-term evaluations of the technical provisions.

- a countercyclical tool: it would be set at a variable level, higher when companies make profits and lower in bad times. This would limit the procyclicality inherent to risk-based systems. A separate Call for Advice on procyclicality will be issued at a later stage.

... This advice should cover the number and definition of the control levels as well as the consequences (actions and/or sanctions) triggered to each level.
Background

Current situation

15.1 Two explicit solvency control levels are currently in place (although current legislation does not use this terminology):

- the required minimum solvency margin; and
- the guarantee fund.

The consequences of breaching these control levels are set out in Article 37 of the Recast Life Directive (and in Article 20 of the First Non-life Directive). The requirement for a complete coverage of technical provisions by admissible assets is an implicit control level. If this control level is breached, competent authorities may limit the free disposal of assets. In some Member States, the supervisor can also require a financial recovery plan.

Explanatory text

Introductory remarks

15.2 The aim is to establish appropriately harmonised compulsory standards to be applied by all supervisors. Supervisors may take additional action where indicated.

15.3 CEIOPS agrees with the Commission Services that the Framework Directive and possible future implementing measures should include control levels, with different functions, together with binding or non-binding consequences to be associated with these various control levels.

15.4 The severity of the ensuing action depends on the type of the control level, which again corresponds to the degree of mismatch. So, the solvency control levels are to be understood as a supervisory action 'ladder', where a minor deficiency results in flexible, or soft, supervisory action (principles-based), whereas a major deficiency results in a firm, rules-based, supervisory intervention.

15.5 This answer is based on the SCR and MCR as defined by CEIOPS. Supervisory reviews of the insurer's individual capital adequacy assessment and risk control processes under Pillar II may result in changes being made to the SCR or the establishment of an 'adjusted SCR'.
Minimum capital requirement (MCR)

Definition

15.6 CEIOPS offers the following working definition of the MCR: "The MCR reflects a level of capital below which an insurance undertaking’s operations present an unacceptable risk to policyholders. If an undertaking’s available capital falls below the MCR, ultimate supervisory action should be triggered.”

15.7 The MCR, as a simple calculation, may not represent a reliable indicator of the capital required to mitigate the insurer’s risks with a given confidence.

15.8 The MCR is above all a 'safeguard' (or safety net); it is set low enough to ensure that failure to meet it represents a very strong indication of under-capitalisation. For this reason, it may also constitute an absolute minimum for internal models. Above all, it must be objective and simple, so as to ensure a level playing field and a rapid response by the supervisory authorities.

Intervention by supervisors

15.9 Given the safety net nature of the MCR, failure to comply with it should trigger firm intervention by supervisory authorities (freezing of assets, withdrawal of licence). In such cases, the capital threshold and the type of action to be taken must be defined with a view to ensuring maximum harmonisation.

15.10 It seems logical to associate a breach of the MCR with an automatic intervention by supervisory authorities and an obligation for undertakings to rapidly restore their financial situation. With this in mind, the provisions in the Framework Directive on the "plan for the restoration of a sound financial position" could be fleshed out and strengthened. Supervisory actions following the breach of the MCR should be subject to Level 3 guidance. The Commission Services’ proposal that if an undertaking’s capital falls below the MCR, principles-based intervention should be replaced by rules-based intervention seems appropriate in order to protect the interests of policyholders, on the assumption that the MCR level is calibrated to correspond to real emergency situations.

15.11 CEIOPS suggests that the Solvency I requirements could be used to calculate the MCR for a limited period of time to smooth the transition to Solvency II and to be asked to review the MCR after this period to find a standard that is possibly better aligned to the objectives set out by the EU Commission and CEIOPS. For such a transition period the supervisory authority should have the power of discretion to decide if it is appropriate to take ultimate action at a breach of the MCR. A transitional period that could only end when a replacement formula had been agreed would not be acceptable to CEIOPS.

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121 See Answer to CfA 9 on safety measures, paras. 9.116 and 9.117.
**Solvency Capital Requirement (SCR)**

**Definition**

15.12 The working definition of the SCR in the Amended Framework for Consultation for Pillar I purposes is as follows: The SCR should deliver a level of capital that enables an insurance undertaking to absorb significant unforeseen losses and gives reasonable assurance to policyholders that payments will be made to them as they fall due. It should reflect the amount of capital required to meet all obligations over a specified time horizon to a defined confidence level. In doing so, the SCR should limit the risk that the level of available capital deteriorates to an unacceptable level at any time during the specified time horizon. The SCR should take into account all significant quantifiable risks.

15.13 For Pillar II purposes, the Working Group has relied on the following working definition: “The supervisory authority must assess the risk profile of the undertaking in order to evaluate the level of the adequacy of the solvency capital requirement. If the supervisory authority concludes that the solvency capital requirement does not match the risk profile of the undertaking, either because there are risks that are not captured by the Pillar I calculation or because they are captured insufficiently, it should be able to require the undertaking to hold more capital against its existing risks. The supervisory authority is also able to require the undertaking to hold more capital if after the supervisory review process it reach the conclusion that the qualitative requirements on governance, internal control, risk management, market conduct, or any other, are not adequate to the insurance company business, or to their nature and scale. This would result in an adjusted SCR until the insurance undertaking has complied with supervisory demands. The obligation to hold more capital (add-on) does not indemnify the insurance undertaking from finding a remedy for the deficiencies within a reasonable timeframe.”

15.14 Where supervisory authorities conclude that an insurer has deficient systems and controls of such nature and scale that they fall below minimum standards and where financial loss may result, the authorities may adjust the SCR to reflect this increased risk while these deficiencies are being rectified or because the undertaking indicates that, for commercial reasons, although it meets minimum standards of control, it does not intend to improve controls to meet best practice. It should be clearly recognised that the imposition of an adjustment in these circumstances is not a means of solving the issue, which must be addressed via other supervisory tools, but of covering the additional risk in the meantime. Supervisory authorities must ensure that in an agreed time frame insurance undertakings remedy the causes for their additional risks, so that the adjustment can be diminished afterwards.

15.15 However, the disclosure of the adjusted SCR is still an open issue and the existence of different consequences between a breach of the 'adjusted SCR' and a breach of the SCR estimated by the standard formula will depend on the decision of the disclosure or not of the
adjusted SCR. From a purely technical point of view, there is only one SCR and its breach should have the same consequences, whether it is calculated using the standard formula, an internal model, or if it has to be adjusted after the supervisor review process (Pillar II add-on).

**Intervention by supervisors**

15.16 If an undertaking does not meet the SCR, supervisory action will be triggered in an attempt to remedy the situation.

15.17 The Commission Services have initially suggested that the SCR threshold should be linked with an obligation on the part of the supervisor to carry out (by a given deadline) a more detailed assessment of the undertaking's situation (by way of on-site inspections or additional requests for information, for example). The supervisor would also enter into a dialogue with the undertaking on the planned measures and timetable for restoring the target level of capital. A report on this dialogue could be sent to the supervisory authorities in those Member States where the undertaking has commitments, thereby helping to promote mutual recognition of supervision and to spell out more tangibly the level of supervision associated with the target level of capital.

**Special case: MCR ≈ SCR**

15.18 Generally, breaching the SCR triggers flexible supervisory action, depending on the causes of the breach and the probability of correction. Breaching the MCR triggers firm supervisory action that may even lead to the withdrawal of permission to stay in business. As noted above, the SCR may come close to or even equal the MCR. This particular case must be discussed in more detail when CEIOPS has decided on a formula for the calculation of the MCR and the SCR. (see also answer to CfA 9, para. 9.51).

**Additional control levels**

**Purpose: Coverage of technical provisions (and, in future, the SCR) by admissible assets**

15.19 The technical provisions' safety level is, in the first instance, derived from the fact that the provisions must be sufficient to meet future commitments.

15.20 The risk margin for technical provisions may be set at a level which would allow a transfer of liabilities at any point of time. Therefore it seems appropriate that the coverage of technical provisions by admissible assets is reflected in a separate control level, although it is clear this is not an explicit solvency control level (see CEIOPS’ Advice: 'Supervisory Ladder', Additional control measure).
Purpose: Early warning indicator

15.21 An early warning indicator could serve as an indication of a deteriorating financial situation at the undertaking. For some Member States an additional solvency control level above the SCR (apart from the ‘adjusted SCR’) does not seem necessary, while other Member States do not see the adjusted SCR as the only solvency control level above the SCR. Since the level of the SCR has not yet been determined, and is innovative, the latter Member States think it would be advisable to have a control level above the SCR. This level would offer the benefit of being harmonised and suitable for public disclosure and would not only reflect private information between the supervisor and the insurance undertaking. Furthermore, these Member States underline that a solvency control level above the SCR should be driven by supervisory and prudential objectives. A prudent supervisor will closely monitor the undertaking’s situation in any case. The examination of whether the capital decreases continuously and approaches the SCR, the first solvency control level, is one of a range of indicators employed in day-to-day supervision. If such indicators provide a reason to act, the supervisory authority should be able to respond in a principle-based way.

15.22 Instead of identifying an early warning indicator above the SCR, as one alternative, downward trends in available solvency capital below the SCR could be recorded. As soon as any sustained drop towards the MCR is evident, the supervisor should be able to take action. Thus, there should perhaps be a mid-level between the SCR and the MCR which would serve as a checkpoint for more 'radical' supervisory measures.

Purpose: A level calibrated on a longer time horizon

15.23 The Commission Services propose that the long-term nature of insurance techniques should be taken into account, together with other factors. The risk measures for calculating the SCR currently being discussed in CEIOPS are geared to a single period. Nevertheless, CEIOPS will also look into other alternatives which may offer benefits without presenting too many practical difficulties. A longer time horizon or a degree of variation within the time horizon may be necessary to enable formulae or internal models to describe more realistically the speed with which the insurer or its supervisor would be able to react.

15.24 If a time horizon of no longer than one year is to be taken into account, supervisory control considerations based on a longer time horizon should be examined qualitatively as part of Pillar II, with the help of a continuity test, for example. Supervisory authorities should have the power, if appropriate, to require companies to run standard continuity tests on an annual basis and to inform supervisors of the results.

15.25 Supervisors should not be obliged to perform a continuity test for every undertaking (principles-based, rather than rules-based supervision). If an undertaking fails a longer time-horizon test, either the undertaking’s capital must be raised or the supervisor should require other measures
to be implemented. Supervisors should not be obliged to examine this kind of solvency control level for every undertaking, rather, if they have doubts or indications of problems, they should take action.

**Purpose: Countercyclical tool**

15.26 CEIOPS will address the issue of procyclicality in more detail in its answer to CfA 22 on procyclicality.

**Purpose: A specific additional control level to determine the overall position (for insurance groups)**

15.27 With regard to solvency control levels, CEIOPS believes that at this stage of the Solvency II project, it is not desirable to make any recommendations on the use of solvency control levels other than the SCR at group level. Group issues will be reflected in the answer to CfA 18.

**Solvency control levels and forms of available capital**

15.28 CEIOPS will discuss this issue in detail in answering CfAs 19 and 20.

**CEIOPS’ Advice**

15.29 CEIOPS’ advice is given in the form of the following schedule (the so-called 'Supervisory Ladder'). The timeframes for supervisory action and concrete measures to be taken still need to be discussed further and the following schedule might need to be revised depending on how the MCR and SCR will be determined. Also, CEIOPS foresees that the findings from an extensive QIS will prove particularly helpful in formulating a more precise view. The following is CEIOPS’ tentative advice. One annex is also attached. Annex C reflects the results of a survey on possible solvency control levels performed by CEIOPS. It could be used as an update on parts of the London Working Group report.

15.30 A survey carried out by CEIOPS highlighted that 150% of the current solvency ratio has represented a critical level. With regard to possible concrete control levels in the future solvency system, CEIOPS notes that it would be beneficial to determine a similar trigger point which could serve as a solvency control level triggering intensified supervision/action since most failures have occurred in entities that have breached the 150% of the current solvency ratio. The relationship between MCR and SCR may also need to be taken into account, since that yet to be determined trigger point be above the SCR. If this occurs, the actual percentage would need to be assessed to take into consideration changes in the determination of asset values, liability values (including technical provisions) and the impact of these changes on the MCR. With regard to the SCR, the survey does not
provide any answers on new solvency control levels, since the existing solvency ratio is considered to be too different (too risk-insensitive) from the SCR.

15.31 Supervisory Ladder

<table>
<thead>
<tr>
<th>Control level 1 (flexible)</th>
<th>supervisory toolkit for this control level</th>
</tr>
</thead>
<tbody>
<tr>
<td>available capital &gt; 'adjusted SCR'</td>
<td>principles-based requirements</td>
</tr>
</tbody>
</table>

- **Early warning indicators above the adjusted SCR**
  - Could be used in a flexible way by supervisory authorities; closer observations of downward trends to the 'adjusted SCR' and SCR, use of early warning indicators in order to identify possible 'near misses' of the 'adjusted SCR' or SCR.

<table>
<thead>
<tr>
<th>Control level 2</th>
<th>supervisory toolkit for this control level</th>
</tr>
</thead>
<tbody>
<tr>
<td>available Capital &lt;= 'adjusted SCR'</td>
<td>principles-based requirements</td>
</tr>
</tbody>
</table>

- **SCR plus an adjustment, if necessary to meet regulatory concerns**
  - According to the Pillar I illustration (see para. 11.14), the 'adjusted SCR' is a second type of adjustment, the adjustment from the SCR to the 'adjusted SCR'. If an 'adjusted SCR' is determined by the supervisory authority, it must be clear that the 'adjusted SCR' is the relevant solvency control level (instead of the SCR) for the supervisory authority. In this case the SCR will be replaced by the 'adjusted SCR'. The 'unadjusted SCR' has no further relevance for the supervisory authority and could be regarded as a kind of interim operand. The SCR is clearly intended to represent a level of capital with which insurance undertakings should operate with a certain confidence. The adjusted SCR represents the same standard – but is a better, more tailored and a more risk-sensitive indicator. Therefore the insurer should suffer the same consequences if it fails to meet the adjusted SCR as when failing to meet the unadjusted SCR.

<table>
<thead>
<tr>
<th>Control level 3</th>
<th>supervisory toolkit for this control level</th>
</tr>
</thead>
<tbody>
<tr>
<td>available</td>
<td>principles-based</td>
</tr>
</tbody>
</table>
| capital \( \leq \) SCR | If an undertaking does not fulfil the SCR, it shall re-establish the amount of capital covering the SCR in due time, based on a concrete and realisable plan submitted to the supervisor for approval.

According to the degree of deterioration:

1. The undertaking should be obliged to notify the supervisory authority (privately) as soon as its capital has fallen below the adjusted SCR level as soon as it becomes apparent that such a situation is likely to arise. The company should provide an explanation of how the situation has arisen.

2. The supervisory authority should notify the undertaking of its concerns and request the undertaking to take measures to rectify the situation or adjust the 'adjusted SCR' appropriately.

3. Meetings will be organized with the Board of Directors and the Senior Management of the undertaking to outline concerns and discuss remedial actions. External auditors would be expected to be kept informed of the situation in the undertaking.

4. Measures that directly address the problem of inadequate capital:

   4.1. Request the insurer to raise additional capital within a timeframe dependent on the speed of deterioration as follows a) require the undertaking to submit a short-term financial situation restoration plan (e.g. max 1 year, with milestones every 1-2 months or when requested by the supervisory authority b) require a new credible medium-term financial situation recovery plan, e.g. in the form of a three-year business plan (the same form as is required when applying for a licence) to be submitted immediately with the milestones, e.g. every 6 months at a minimum or when requested by the supervisor.

   4.2. Limit the redemption/repurchase of equity instruments; and set limitations on dividend payments.

   4.3. Request to rearrange investments to reduce risks. Meanwhile, the supervisory authority is
entitled to take some restrictive measures, such as restricting the writing of business considered too risky.

5. Measures that are intended to enable the supervisor to better assess and control the situation, e.g. increased supervision activities, increased supervisory reporting, to require an undertaking to appoint an independent party acceptable to the supervisor, to provide a report prescribed by the supervisor, to require the undertaking to extend the scope of internal or external auditors’ or consultants’ work (at company’s cost), and for the professionals engaged to be required to report directly to the supervisory authority. Further activities can include requiring additional stress-testing and scenario analysis, commissioning independent actuarial reviews, and applying prudential limits and restrictions more rigorously.

6. Imposed measures to reduce risks, e.g. refusing, delaying or imposing conditions on request or applications submitted for regulatory approval, such as acquisitions and redemptions or repurchases of equity; set restrictions on accepting new business; minimise the investment risks if the insurer did not do so voluntarily (see also 9.52). For all the measures listed above, the situation has to be rectified as soon as possible but with a maximum of one year with regular reports with 3 to 6 months intervals.

<table>
<thead>
<tr>
<th>Control level 4 ('ultimate actions')</th>
<th>Supervisory toolkit for this control level (subject to level 3 guidance)</th>
</tr>
</thead>
<tbody>
<tr>
<td>available capital &lt; MCR (including an absolute floor)</td>
<td>rules-based</td>
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</tbody>
</table>

Undertaking's viability is in doubt and some restructuring is likely.

The following actions are presented in order of the degree of the deterioration of the situation.

1. In this case, the supervisory authority should require that the undertaking present a credible written detailed plan, within a short number of days (i.e. max of 7 days), to restore capital to at least the level of MCR, or otherwise restructure or prepare for an orderly run-off of existing
absolute floor (expressed in euros - see 9.116)

Undertaking not viable or has no reasonable prospect of being able to pay policyholders’ benefits as they fall due.

<table>
<thead>
<tr>
<th>Additional control measure</th>
<th>supervisory toolkit for additional control measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>admissible assets covering technical provisions plus SCR</td>
<td>rules-based</td>
</tr>
</tbody>
</table>

Having enough technical provisions and the MCR would be useless if the technical provisions, the MCR and the SCR were not covered by sufficient and adequate assets. In this case, the supervisory authority should require the undertaking to submit a credible written detailed plan for the undertaking to return with sufficient and adequate assets within 6 months.

Meanwhile, the supervisor should closely monitor the way the undertaking’s assets are streamlined, and, if necessary, prohibit the buying or selling of some particular assets or classes of assets.

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122 It should be stressed that new business includes both renewals of existing business as well as new contracts.
Call for Advice No 16

Fit and proper

Extract from the Call for Advice:

The Commission Services would like CEIOPS to advise on whether it is necessary to change the current wording of the Directives and, if so, on the elements that could be considered in the new Directive. More generally, CEIOPS is invited to advise on an optimal level of harmonisation of the fit and proper criteria. The decision on the precise degree of harmonisation has still to be taken at political level. However, CEIOPS is asked to provide technical advice as input to help make such a decision.

Background

16.1 The current Directives state that the persons that “effectively run” the insurance undertaking must be “of good repute with appropriate professional qualifications or experience” (Article 6 para. 1(e) of the Recast Life Directive and Article 5 of the Third Non-Life Directive modifying Article 8 of the Directive 73/239/EEC), and that shareholders and members with qualifying holdings must have the necessary qualifications “to ensure the sound and prudent management” of the undertaking (Articles 8 of the Recast Life Directive and of the Third Non-Life Directive).

16.2 The same fit and proper requirement applies to the management of branches of EU insurance undertakings (Article 40 para. 3 of the Recast Life Directive and Article 32 of the Third Non-Life Directive). The general representative of branches of third-country undertakings must also be approved (Article 51 of the Recast Life Directive and Article 23 of the First Non-Life Directive 73/239/EEC) and – although there is no explicit mention of these conditions of approval - fitness and propriety are surely part of these conditions.

16.3 A specific article aims at harmonizing throughout the EU the proof of good repute by defining it as an extract of the judicial record or an equivalent document (Article 61 of the Recast Life Directive and Article 3 of Directive 73/240/EEC abolishing restrictions on the freedom of establishment in non-life insurance).

16.4 The recent informal ECOFIN Council in Scheveningen discussed obstacles to mergers and acquisitions in the EU-banking sector. One of the main difficulties encountered was the role supervisory authorities could play in the acquisition of national banks through their application of the rules governing qualifying holdings. As a result, Commissioner
Bolkestein agreed to review Article 16 of the consolidated Banking Directive (2000/12/EC) on “Qualifying holdings in a credit institution”. Since similar provisions exist under Article 15 of the Recast Life Directive (and correspondingly for non-life insurers), analogous scope for national supervisory action may also exist in the insurance sector. In the light of the recent ECON discussion, consideration should be given to these issues.

**Explanatory text**

16.5 The application of the existing fit and proper criteria seems to vary considerably between Member States.

16.6 This is so as the wording in the current legislation leaves scope for inconsistent application and for applying them to persons with different functions. Theoretically, a person with certain qualifications and reputation could be considered fit and proper for a particular position in one Member State but the same person with unchanged qualifications would fail the test for a position of similar nature in another.

16.7 The criteria should be fully harmonised with regard to the definitions of fitness and propriety, the scope of application of the criteria, the functions whose eligibility supervisors must assess and the supervisory powers in the event that a person should not meet the criteria. This is important in ensuring that insurance undertakings are well managed, especially so since robust fit and proper requirements reduce the risk of failure. CEIOPS also considers it desirable to seek convergence in the assessment process through level 3 supervisory guidance.

16.8 The term 'fit and proper' is not used in the present legislation, but rather the directives define the requirements that are to be met. Since the term 'fit and proper' is now commonly used when referring to these particular requirements, CEIOPS suggests the future Framework Directive should also use this well-known terminology, although with an updated definition.

16.9 At present, the scope of the fit and proper requirements extends to the personal and professional qualifications of persons who 'effectively run' an insurance undertaking. 'Effectively run' is a term subject to interpretation. The discussions on how best to reflect the different European board structures and legal systems in view of achieving a more convergent scope for the fit and proper system have been intense. The most practical approach was considered to be to define a list of functions to which the fit and proper criteria should apply.

16.10 A comprehensive list should be developed at level 2. CEIOPS thinks that at least the persons in the following, or similar, functions should be subject to appropriate and proportionate fit and proper requirements ('regulated functions'):
• Governing functions\textsuperscript{123}
  
  o Board of Directors function
  
  o Senior Management function

• Required functions
  
  o Apportionment and oversight function
  
  o Actuarial function
  
  o Compliance oversight function
  
  o Money laundering reporting function

• Systems and controls functions
  
  o Finance function
  
  o Risk assessment and management function (e.g. Chief Risk Officer)
  
  o Internal Control function
  
  o Internal audit function

• Significant management function (e.g. persons with responsibility for business lines).

16.11 All of these functions will be of importance within the new solvency regime. Regarding the importance of, e.g. the actuarial function, not only in the valuation of technical provisions but also in the overall risk management process of the insurance undertakings, CEIOPS advice is to harmonize the objectives of the actuarial function within insurance undertakings. Annex A proposes a framework for the actuarial function.

16.12 The responsibility for verifying fulfilment of the fit and proper requirements rests either solely with the undertaking or with the undertaking together with the supervisory authority. The supervisors’ duties should at least include assessing whether persons with governing functions meet the requirements. A Member State has expressed a view that they should not be forced to assess the senior management function.

16.13 To ensure that supervisors assess the level of compliance with the fit and proper criteria with equal scrutiny, level 3 supervisory guidance should be provided relating to the criteria to be examined.

\textsuperscript{123} The terms ‘Board of Directors’ and ‘Senior Management’ are used in the answers to the Calls for Advice in a functional rather than a legal interpretation, since the legal interpretation varies between Member States. See IAIS Insurance Core Principle No. 9.
Generally speaking, compliance with the fitness requirement means that a person should have sufficient technical qualifications or personal vocational experience to ensure sound and prudent management and decision-making at an insurance undertaking. The knowledge or experience required depends on the functionary’s position and responsibility within the undertaking. Knowledge and expertise should relate to one or more of the following areas, depending on the specific function:

- professional management of an organisation;
- rules and regulations applicable to the insurer;
- insurance products and markets;
- financial and actuarial aspects such as financing, investments and financial markets, actuarial principles and reinsurance;
- administrative organisation, internal control and risk management;
- financial accounting and reporting; and
- outsourced arrangements.

Harmonisation of the 'expertise' requirements deemed necessary to take up specific functions should be pursued with the help of supervisory guidance.

Ideally, every director should possess sufficient theoretical and practical insurance knowledge. In practice, however, it would be difficult for an undertaking to acquire experts in certain business areas, e.g. IT or asset management, if they also had to possess knowledge or experience specific to the insurance sector. For this reason CEIOPS believes that when assessing the required level of knowledge and expertise, the qualifications and experience of other functionaries in the same position within the insurer should be taken into account as a complementary factor. Nevertheless, all individuals should be required to have an adequate minimum level of knowledge and experience concerning insurance business so as to be able to discharge their joint responsibilities and to monitor the actions and omissions of the other directors. As is the case under governance codes in some countries, the Board of Directors should assess their effectiveness in discharging their responsibilities, both individually and as a board, and training needs should be identified and addressed.

Good management of an undertaking plays an important role in safeguarding a company against possible failure. Members of the supervisory board, or, in a unitary board system, of the non-executive board, however, do not play as important part in the actual day-to-day

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124 The terms „Board of Directors“ and „Senior Management“ are used in a functional rather than a legal interpretation, since the legal interpretation varies between Member States. See IAIS Insurance Core Principle No. 9.
management of an undertaking as the executive directors. As such, they should not be required to meet the same fit and proper criteria. Nevertheless, CEIOPS is of the opinion that members of the supervisory board/non-executive directors should fulfil at least propriety requirements.

16.17 The fit and proper requirements should apply to all insurance undertakings. A person running a small undertaking, however, does not need the same level of expertise as a person running a much bigger one in order to be able to execute his duties adequately. So, the fitness requirement should allow for some flexibility regarding the appropriate level of expertise. This could be achieved by defining a rule that allows for exceptions, as opposed to a hard-and-fast rule relating to the conditions that generally indicate fulfilment of the fitness requirement (on level 2 or through supervisory guidance). This would promote convergence in supervisory practice and still permit supervisory authorities to accept deviations from the rule in justified cases, thereby taking individual cases sufficiently into account.

16.18 'Proper' is defined as being reliable and respectable. The following indicators could help to identify areas which should be examined:

- indicators relating to involvement in criminal conduct;
- financial indicators that provide information on possible financial misconduct, improper conduct in decision-taking, in financial accounting or negligence;
- supervisory indicators that provide information collected by supervisors in the course of their supervisory duties. This includes information also from other financial sectors. Many Member States have legislation in place to protect the privacy of individuals. CEIOPS recognises that there may be limitations to a free exchange of information between supervisors or to the gathering of such information;
- there may also be other indicators in a principles-based system that can provide information relevant to the propriety of the individual.

16.19 Where, for instance, there are records or evidence of an individual’s previous business conduct or activities that suggest he/she was engaged in business practices that were actually deceitful or otherwise improper, or which otherwise shed a negative light on the individual’s business methods, this information can also be taken into account, when making the overall assessment. CEIOPS recognises that in some countries the legal system requires more formal and prescribed grounds for not being fit and proper.

16.20 According to the wording in the current legislation, the Board of Directors and Senior Management must fulfil fit and proper criteria before an undertaking is granted a licence. Supervisors’ fit and proper assessment should not be limited to the licensing procedure but should also be carried out in a similar fashion if an undertaking wishes to
appoint an additional person to the function or to change a person exercising the function.

16.21 Furthermore, the supervisory assessment should not end after a person has been approved. Supervisors need to remain alert to any information that could alter their assessment. A single event may result in a person no longer being considered fit and proper. Supervisory authorities should also consider the overall picture; individual ‘instances’ which would not be sufficient to dispute a person’s suitability or reliability, however, the occurrence of a number of them may together indicate unsuitability. CEIOPS recognises that in some Member States a disqualification can arise only from formal and prescribed failures or events, as prescribed in legislation.

16.22 The degree of incompatibility between the position of a manager in an insurance undertaking and other activities is an important criterion for judging whether a specific person can be appointed as a manager. The decisive factor is whether the other activity might conflict with the interests of the insurance undertaking and/or policyholders. An activity as an insurance broker is a prime example.

16.23 Modern information technology enables people to conduct a large proportion of their business duties from virtually anywhere without actually having to enter their offices. Nevertheless, if a manager’s place of residence is a considerable distance from his office, steps have to be taken to ensure sound and prudent management at the insurance undertaking.

16.24 In order to avoid the problem of a dominant CEO or Chairman who operates in isolation, CEIOPS proposes that there are a number of different ways of reducing this risk. The utilisation of the ‘four eye principle’ that is to say, that at least a minimum of two persons are actually managing the company, is one way in addressing this problem. Other alternatives are that undertakings must have strong internal controls, a governance structure which supports a collegiate decision making process, active board participation and independent and challenging audit arrangements provide a more immediate and effective check on the dominance of an individual. Article 6.1 of the Directive 2000/12/EC relating to the taking up and pursuit of the business of credit institutions, for example, also dictates that authorisation will only be granted if two executive directors are appointed. The discussion in CEIOPS underlined the importance of good management in guarding against the collapse of companies. This importance would not be adequately taken into account if the management of an undertaking were entrusted to a single person who would thus not be obliged to coordinate planned decisions or to take the opinion of another person into account. In the past, it has not been possible to agree on a common minimum number. There may be some particular situations where exceptions could possibly be admitted, e.g. in the case of small, captive, or specialised insurers.

\[\text{As amended by Directive 2000/28/EC}\]
16.25 CEIOPS is aware that explicit language requirements represent a sensitive issue, since such requirements might be subject to abuse in an attempt to keep non-nationals out of particular markets. Nevertheless, there are valid reasons for wanting to keep persons who lack the appropriate proficiency, or means of communication, in the corresponding Member State’s language from taking a Senior Management position in an insurance undertaking. Insufficient language skills can be a serious handicap when it comes to participating in the information loop at an undertaking. It can also impede communication with colleagues, external parties and the supervisor. This could prevent a person from adequately discharging one’s duties and responsibilities, no matter how impressive the qualifications or how extensive the experience. Unless the undertaking is able to show that it has found a way of adequately dealing with a lack of proficiency in the national language of a senior manager (e.g. by giving him/her an interpreter or having other common language within the company), supervisors should have the power to consider that person unfit. CEIOPS emphasises the importance of having arrangements in place to ensure that Board members are fully able and equipped to understand, and to contribute to, what is being discussed, e.g. by meetings being conducted in a language in which all members are proficient even if this is not the national language of the solo entity. Some members of CEIOPS even believe that there is no possible remedy for board members and management who lack adequate proficiency in the national language, since it would pose a substantial obstacle in the communication between the supervisor and the undertaking during on-site inspections.

16.26 Supervisory authorities should have the option to demand that the individual possesses a reasonable minimum number of years of experience of management.

16.27 Article 15 of the Recast Life Directive is an important element of the prudential framework for the regulation of insurance undertakings. It has proven valuable and has worked well, and hence there would not seem to be any need to change the provisions from a prudential point of view. In the case of a qualified shareholder, supervisory authorities must ensure that there are no aspects which may pose an obstacle to sound and prudent management in the undertaking. The appropriate application of this article requires a good deal of flexibility. It is necessary to allow room for discretion for competent authorities. As a wide variety of reasons for disqualification are conceivable, they cannot be prescribed exhaustively at the outset. CEIOPS will therefore list a set of suggested level 3 principles and measures, defining what supervisors should and should not consider when assessing qualifying holdings. Discretion should not be confused with arbitrary decisions. Loosening the criteria when assessing a qualifying shareholder could lead to a drop in the prudential safety.\(^{126}\)

\(^{126}\) CEIOPS is aware of the similar work underway in the context of banking and has consulted with CEBS in order to ensure alignment between the sectors.
16.28 It should also be noted that the importance of Article 15 of the Recast Life Directive for prudential purposes has not been questioned. What has been questioned is the use of similar provisions in the banking sector for other reasons not related to prudential supervisory concerns. In CEIOPS discussion it became evident, that Article 15 has not been used in an inappropriate way so as to act as unjustified obstacles to cross border mergers and acquisitions. CEIOPS does not therefore believe that problems have arisen from the current drafting or transposition of Article 15, but believes its proposals to harmonise the assessment of fitness and propriety in Member States will assist in addressing any possible perceptions that Article can be abused.

16.29 The supervisory powers in a group context will be addressed in the answer to the CfA 18.

CEIOPS’ Advice

Scope of application

16.30 As a general principle, all key personnel in critical functions in an insurance undertaking must be fit and proper. The main responsibility for ensuring fitness and propriety lies with the undertaking itself. The burden of proof that a person is fit and proper lies with the person or the undertaking, although supervisors also assess fitness and propriety.

16.31 In the new framework the provisions from the current legislation should be carefully supplemented to highlight the fact that the fit and proper requirements are obligatory for at least a minimum list of designated functions (regulated functions). This list could be further elaborated in possible future implementing measures. Furthermore, CEIOPS suggests using the term 'fit and proper' in the Framework Directive, but carrying over the definition from the existing legislation.

16.32 Members of the supervisory body/non-executive board must be at least reliable and respectable.\(^{127}\)

16.33 The Board of Directors, i.e. the executive governing function, as a whole must have sufficient theoretical and practical knowledge of insurance.

16.34 Senior Management, actuaries (internal or external), and external parties such as accountants, auditors and investment managers, must be considered fit and proper in line with para. 16.10, if the function they are exercising is a regulated function as defined in the possible future implementing measures. In the case of auditors and actuaries, supervisory authorities may refer to or rely on professional bodies

\(^{127}\) Additionally, a Member State is in favour of applying fit and proper criteria to those parts of the supervisory board responsible for approval of central business, investment and risk management strategies. A further Member State favours bringing the supervisory board fully within the scope of fit and proper criteria.
that set and enforce standards for professional conduct. See Annex A which proposes a possible framework for the actuarial function.

16.35 In principle, the requirements should apply to all insurance undertakings, although they should be assessed with a reference to the nature and the size of the business (principle of proportionality).

Definition

16.36 CEIOPS understands 'fit and proper' in a narrow sense as follows:

Technical qualification and/or personal vocational experience (fit)

16.37 This means that the qualifications, knowledge and experience of the person subject to the fitness requirements should be sufficient and adequate to enable sound and prudent management and decision-making at the insurer.

16.38 The knowledge and experience required depends on the position and responsibility of the functionary within the insurer.

Reliability and respectability (proper)

16.39 The past and present attitudes, conduct and actions of the person who is subject to the propriety requirements should be such that his integrity is beyond reasonable doubt. Indicators of an individual's level of integrity can be of criminal, financial, supervisory or of any other nature.

16.40 Fit and proper in the widest sense also includes requirements on the compatibility of the targeted function with already existing functions, on the place of residence, on a minimum number of years of professional experience and on the sufficient proficiency in the national language/s of the undertaking's main centre of operations, or in any other languages accepted by the responsible supervisory authority, as well as being able to communicate sufficiently well through other means. Furthermore CEIOPS proposes that there are a number of different ways of reducing this risk of a dominant CEO or chairman. The utilisation of the ‘four eye principle’ that is to say, that at least a minimum of two persons are actually managing the company is one way in addressing this problem. Other alternatives are that undertakings must have strong internal controls, a governance structure which supports a collegiate decision making process; active board participation and independent and challenging audit arrangements which provide a more immediate and effective check on the dominance of an individual. There may be some situations where exceptions to this could be admitted, e.g. in the case of small, captive, or specialised insurers.
**Time of application**

16.41 The assessment and testing of fitness and propriety by supervisors or undertakings should take place as part of the authorisation procedure before an insurer is granted access to the insurance market and – if the undertaking is already authorised - before individuals whose fitness and propriety is being assessed take up their duties and responsibilities. The requirements should be checked in the same way in all cases (e.g. new authorisation, function restructuring or the appointment of an additional manager on a function). It is the insurer's obligation to inform the supervisory authority prior to a person being replaced or whenever they have reason to believe that the fitness or propriety of any previously assessed persons has changed.

16.42 A supervisor or an undertaking can decide to reassess the fitness and propriety of an individual if that individual’s conduct or actions give cause for such a measure. If offences / indications of an offence are detected during the ongoing supervision, compliance with the fit and proper criteria must also be checked. This includes regular re-evaluation, including analysis of the business activity and of the environment of the undertaking, particularly in the event of a change in strategy.

**Insurance groups**

16.43 Compliance with the fit and proper criteria is required from all EU insurance undertakings in an insurance group. The same kind of compliance will be required from the senior management of the EU parts of the group.

**Powers of the supervisory authority**

16.44 These powers are described in the answer to request No. 14 'Powers of the Supervisory Authority', enabling all supervisors to use the same toolkit.

**Shareholder Control and Qualifying Holdings**

16.45 In the context of shareholder control, CEIOPS considers it necessary to ensure that qualified shareholders are suitable. This entails the following common criteria concerning the sound and prudent management referred to in Articles 8 and 15 of the Recast Life Directive:

- the shareholder should have 'appropriate financial strength';
- the prospective shareholder should not have a negative influence on the corporate governance or the objectives of the
undertaking (including their achievement);

- the shareholder should have integrity and reliability (‘proper test’); and

- the group structure should be transparent to allow appropriate supervision according to Article 6 (2) of the Recast Life Directive.

CEIOPS discussions would suggest that Article 15 of the Recast Life Directive has not been used in an inappropriate way so as to act as an unjustified obstacle to cross-border mergers and acquisitions. CEIOPS does therefore not believe that problems have arisen from the current wording or transposition of Article 15, but believes that CEIOPS’ proposals to harmonise the assessment of fitness and propriety will assist in addressing any possible perceptions that Article 15 can be abused.

16.46 Additional criteria to consider when assessing suitability:

- the target undertaking; i.e. the complexity of its business, its financial position, the size of the undertaking in relation to the acquirer’s financial strength; and

- the possible emergence of conflicts of interest in an undertaking arising from possible competing interests between acquirers of qualifying holdings and the targeted undertaking.

16.47 CEIOPS believes that a more harmonised approach to 'fit and proper criteria' within the authorisation process would minimise the need for separate 'fit and proper' control within the assessment of 'sound and prudent management'.

16.48 If compliance with the fit and proper criteria is examined across the EU on the basis of common criteria, this may render a separate test of the fit and proper criteria as part of the assessment of sound and prudent management unnecessary. Nevertheless, an effective exchange of information between supervisors is required. The check could only be omitted if this exchange has been done. If the key functionaries under assessment are corporate institutions regulated in other Member States than the insurance undertaking, supervisors should seek confirmation from the relevant supervisor that the institution is of good standing in that Member State.

16.49 If an individual has been working outside the insurance sector but within another regulated financial services sector in another Member State, it may also be necessary to exchange information with the supervisor in that other sector either directly or via the insurance supervisor for that Member State.

16.50 CEIOPS is of the opinion that it is desirable that the same set of sound and prudent management and fit and proper criteria are applied in different financial sectors. The necessary specific technical knowledge
16.51 CEIOPS believes that it is not necessary to change the threshold values in Article 15 of the Recast Life Directive nor does CEIOPS see any need for further convergence.
Call for Advice No 17

Peer review

Extract from the Call for Advice:

Although this subject has been discussed in the Insurance Committee, no political consensus has emerged yet. In order to provide input for future discussions on this issue in the Insurance Committee, CEIOPS is asked to offer technical advice on the procedure that is to be followed in these peer reviews, if they were to be set up. The Commission would like CEIOPS to advise on the following elements:

- **Basis of the assessment:** Comments are requested on the suggested basis for peer review. Should this be based on CEIOPS supervisory guidance and EU legislation or should it introduce other elements, such as IAIS principles, and/or should a specific questionnaire be elaborated?

- **Scope of the peer review:** Should the review cover the overall activity of the supervisory authority visited or should it focus on particular aspects?

- **Implications and follow-up action of peer reviews:** Both for the supervisory authorities visited (e.g. remedial action, statistics on supervisory activity, additional resources devoted, ...) and for the supervisory authorities lending participants for the peer review process. In particular, the implications for smaller supervisory authorities should be considered.

- **Practical modalities of the peer review:** Duration, choice of participants, organisations interviewed (e.g. should participants meet representatives of the insurance industry for example), ...

- **Peer review report:** Characteristics (form of the report, confidentiality requirements, etc.) and follow-up action triggered by the peer review report.

- **Strength of the recommendations.**

For background and reference purposes only; the legal text could be formulated along the following lines:

“Supervisory authorities will aim for increased harmonisation of working methods through peer reviews, in an effort to secure a high-level protection for policyholders.”
Background

17.1 This document aims to introduce a methodology which will provide guidance for assessing the implementation of CEIOPS standards and other level 3 measures.

CEIOPS seeks to promote the consistent practical implementation of the regulatory framework across all the Member States of its members on issues concerning insurance supervision.

CEIOPS members are committed to implementing CEIOPS measures. Article 2(2).4th bullet point, of the CEIOPS’ Articles of Association states: “(CEIOPS) may draw up guidelines, recommendations and standards which the Member States may adopt in their supervisory practices on a voluntary basis.” Article 4(3) states: “All agreements, standards, commitments and work agreed within the Conference of Insurance Supervisory Authorities of the Member States will be taken over by the members (of CEIOPS)”.

The following methodology must be read in the context of the relevant CEIOPS measures, in particular the CEIOPS Articles of Association.

Explanatory text

Introductory remarks

17.2 The insurance acquis (Article 10.1 of the Recast Life Directive and Article 9 of the Third Non-life Directive) specifies that the “financial supervision of an insurance undertaking shall be the sole responsibility of the home Member State”.

17.3 Supervision of an individual insurance undertaking is clearly a national competence. The regulatory framework in Europe allows national authorities some flexibility in interpreting and transposing directives within national legislation. This can, however, potentially result in regulatory arbitrage and divergent supervisory practices.

17.4 While each Member State has its own supervisory practices, it is very important that these practices can be compared to one another to ensure continuing confidence in the system of mutual recognition under which insurance undertakings authorised in a Member State may benefit from the European passport.

17.5 The Lamfalussy conclusions also recognised the need for a more flexible and expedient way of amending the technical detail in the legislative framework in order to better respond in a more timely fashion to the changes in the fast-moving financial markets, to consequences of progressing integration and to respond to new risks that may arise as a result. In practice, co-operation between EU supervisors has several dimensions. A number of CEIOPS’ bodies (e.g. Working Groups, future 'Review Panel' etc.) provide fora and channels
for co-operation and exchange of information between supervisors from different Member States.

17.6 Supervisory authorities can, and should, learn from one another. This should help to ensure that across all Member States high-quality supervision in line with best practices in the various aspects of supervision is being practised, thus increasing confidence in the robustness of EU markets and in the quality of supervision in the EU.

17.7 As peer review is understood to mean subjecting one’s work\(^{128}\) or ideas to the scrutiny of one or more others who are experts in that specific field, it would seem that CEIOPS is the most appropriate body for organizing this process and conducting peer reviews in the field of insurance supervision. The peer review process should be performed on the basis of a framework, and it relies heavily on mutual trust between CEIOPS members.

17.8 The following consideration represents a first stage in the thinking of CEIOPS on the way peer review may be organised. It does not represent formal proposals. CEIOPS will need to consider further how the peer review process will be organised and conducted.

17.9 CEIOPS distinguishes the peer review from other review mechanisms:

- the peer review is not a judicial proceeding and the final outcome of the peer review is not a binding act or legal judgement by a superior body; it never results in a punitive decision or sanctions;
- experts from other insurance supervisory authorities carry out the peer review and it can be both on-site and off-site.

17.10 The peer review within the EU therefore differs in some respects from review processes conducted by other international organisations.

17.11 The general aim is that the peer review serves to promote high quality and consistent supervisory standards and facilitates learning between supervisory authorities.

17.12 Peer review should not be limited to supervisory practices in relation to single entities, but should also address supervisory practices on both insurance groups and financial conglomerates, and should aim to reduce differences in interpretation.

17.13 The peer review could be an important and effective tool in harmonising supervisory methodology and practices in the EU. Open questions include how best to introduce the peer review mechanism, how formal this review should be and how often it should take place. The details of the peer review process should be established at level 3.

17.14 For this purpose, CEIOPS should consider establishing a separate dedicated body for conducting peer reviews (e.g. ‘Review Panel’). The

\(^{128}\) With regards achieving a consistent treatment for undertakings across jurisdictions, CEIOPS envisages that there will be a substantial body of work to achieve supervisory convergence, especially concerning the supervisory treatment of internal models.
The Review Panel would be a permanent group comprising CEIOPS member representatives. It should be a standalone body, responsible to the CEIOPS Managing Board and CEIOPS’ Members’ Meeting (supported by the CEIOPS Secretariat).

17.15 Any particular detailed mandate for the Review Panel is to be discussed and decided at a later stage, especially so since the establishment of the Review Panel will become more timely once CEIOPS members start implementing the future Solvency II framework.

17.16 The peer review process, as organised by the Review Panel is an overview instrument for CEIOPS. There are no regulations prescribing which elements of peer review will be applied or how they are to be implemented. In view of the desired result, CEIOPS can decide whether the information base is sufficient for extending CEIOPS standards and guidelines or whether it is necessary to collect further information. Before the peer review can be introduced as a system, a preparatory period is needed.

**Procedural framework of the Peer Review**

17.17 Based on adequate information, the peer review should serve CEIOPS in developing, extending and improving its standards and guidelines. As an ultimate aim, these can be used to help to promote convergent interpretation of standards, guidelines and the experiences of other supervisory authorities to reflect best practices.

17.18 The peer review is not a warning system. It could be used as an instrument through which the supervisory authorities can learn from one another, enabling them to achieve high-quality, consistent supervisory practices.

17.19 The peer review should be assigned a particularly important role in the development of monitoring procedures for implementing the new solvency system.

17.20 The main idea is to develop agreement on common standards; differences between the practices of individual supervisory authorities should be avoided if they risk prompting supervisory arbitrage.

17.21 Peer review is intended to go beyond fact-finding and includes an assessment of the practices of the reviewed supervisory authorities.

17.22 At the beginning of the peer review process for a particular issue, the Review Panel will, if necessary, develop a questionnaire and detailed assessment criteria relating to a measure that is to be reviewed.¹²⁹

17.23 Those CEIOPS members to be reviewed will perform a self-assessment (e.g. with the aid of a questionnaire and detailed assessment criteria) in line with agreed CEIOPS methodology, within a timeframe agreed beforehand, and will provide the assessment team with the resulting

¹²⁹ CESR: GENERAL REVIEW CRITERIA.
information. Where necessary, the CEIOPS Secretariat will check the accuracy and completeness of the responses of individual CEIOPS members, in order to ensure an acceptable level of consistency in the self-assessments.

17.24 After completing the self-assessment, the assessment team, set up by the Review Panel, may carry out an on-site examination. When deciding what to review at this stage, the assessment team will, in particular, consider any responses received following the self-assessments and recognise the best practices revealed, which could serve as an example to others. It should also pay attention to potential problems.

Basis of the assessment

17.25 The tasks of the peer review are firstly:

- to collect information and store it in a confidential database;
- to assess supervisory practices; and
- to identify discrepancies in the way in which supervisors assess appropriate capital for individual insurers or take other prudential measures.

17.26 As a second step, the task of the peer review might consider the lessons for the development and future assessment of the implementation of CEIOPS standards.

Scope of the peer review

17.27 The outlay incurred by performing peer reviews should be adjusted as far as possible to take account of the varying resources of the supervisory authorities. In light of the objective of acquiring information to develop standards, the peer reviews should be implemented in the context of specific issues.

17.28 It is anticipated that a relatively high number of peer reviews will take place, due to the large number of individual issues to be considered. All supervisory authorities are to be subjected to a peer review on the basis of a schedule that is yet to be developed and approved by CEIOPS. The schedule should recognise that the burden falling especially on the smaller supervisory authorities can be considerable.

Implications and follow-up action of peer reviews

17.29 CEIOPS is responsible for organising peer reviews. The content of the peer reviews is defined by the Review Panel of CEIOPS, a permanent committee. The execution is the specific responsibility of an assessment team, to be assembled for this purpose. The assessment team is responsible for the following individual tasks:
• the development and execution of self-assessments, including as a precursor to on-site examinations where appropriate;

• the compilation of documentation and analyses during peer reviews;

• the organisation of meetings between the persons involved in the peer review process;

• ensuring, on an organisational level, a consistent quality and continuity of execution;

• preparing and analysing the resulting data and ensuring it is forwarded to the Review Panel.

For the permanent Review Panel, CEIOPS could also examine ways of taking industry views into account and also underline CEIOPS’ commitment to transparency and working with the industry.

17.30 An important part of the peer review process still to be discussed and decided is the question of how to organise the follow-up to an assessment. For example, one possibility could be that the assessment teams summarise the peer review’s findings in a report. The supervisory authorities under assessment are then given, in writing, the opportunity to discuss the findings of the report before the final report is submitted to the Review Panel.

17.31 The Review Panel collects all information generated as part of the peer reviews in the form of self-assessment questionnaires and the final reports of any on-site assessments that may be useful to other supervisors. This information will also be fed into a future CEIOPS database, which will form the basis for CEIOPS to draw up or improve its standards, guidelines and recommendations.

17.32 CEIOPS’ members are integrated into the process at different levels. Firstly, they provide the experts for the peer review, and secondly, they are themselves subject to examination.

**Practical aspects of the peer review**

**Timeframe of peer reviews**

17.33 Peer reviews can comprise a number of different elements. For the most part, these can be grouped as follows:

• the preparation phase: This phase involves gathering all the information that does not require on-site examination, in order to reduce the burden placed on the parties involved to a minimum. For this reason, specific issue questionnaires in the form of self-assessments are sent to the candidates in advance, and the results are evaluated. If necessary, external information sources, such as the FSAP reports of the IMF or the reports of the 'Peer
Review of Effective Financial Services Supervision, are also taken into account, insofar as they are available;

- on-site assessment: On-site assessments may last up to one week. Examination of supervisory practice procedures should be given top priority during this time;
- post-processing phase: The information and experiences obtained are collected by the Review Panel and summarised in a report in the post-processing phase. The authorities concerned are able to review the report.

Choosing the supervisory authority to be reviewed

17.34 ‘Peer review is a co-operative process conducted on a voluntary basis aiming for supervisory convergence. Among those supervisory authorities which have volunteered, the Review Panel proposes a selection to be assessed, which must be approved by CEIOPS. This selection must take into account a number of different criteria:

- the quality of the anticipated supervisory implementation of the guidelines to be examined;
- the scope of the anticipated alternative implementation of the guidelines to be examined;
- a schedule, on the basis of which all supervisory authorities are subjected to a peer review, according to the capacities of the domestic supervisory authorities.

Peer review report

Confidentiality and structure of the report (restricted use)

17.35 The assessment team produces a final report at the end of each peer review. This contains the experiences obtained during the execution of the self-assessments and as part of any on-site assessments, as well as the self-assessment questionnaires of the supervisory authorities and the individual reports of the on-site assessment teams, as reviewed by the authorities concerned. Peer review reports must be treated in strict confidence and are only available to the Review Panel and members of CEIOPS, though they may ultimately be published with the agreement of members.

Consequences and recommendations (conclusions and follow-up measures in response to the final report)

17.36 CEIOPS uses the final reports from peer reviews as the basis for drawing up or improving its standards, guidelines and recommendations. Individual members may also use the reports as a
basis for considering improvements to their supervisory regimes where appropriate.

**Reinforcement of the recommendations**

17.37 In Section 4.3 of CEIOPS’ Articles of Association, all members have consented to voluntarily adopt all agreements, standards, commitments and actions agreed within CEIOPS in so far as possible.

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<th><strong>CEIOPS’ Advice</strong></th>
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<td>17.35  CEIOPS supports the inclusion of high-level general principles in the Framework Directive on peer reviews to promote increased convergence of supervisory working methods, thereby securing high-level protection for policyholders.</td>
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<td>17.36  CEIOPS will define a set of level 3 principles and measures which supervisors should take into account when designing a concrete procedural framework for the peer review.</td>
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Group and cross-sectoral issues

Extract from the Call for Advice:

The Commission Services request CEIOPS to analyse what amendments, if any, to the current Insurance Groups Directive\textsuperscript{130} (IGD) would be needed to make Solvency II workable for the supplementary supervision of insurance undertakings in an insurance group.

This answer analyses specific issues that future legislation will have to address or take into account regarding groups:

- the scope for regulatory arbitrage (I);
- capital requirements at group level (II);
- Supervisory Review Process (III), and in particular the validation of internal models (IV), for groups.

Background

18.1 The European Commission has noted that during the 1990’s major changes have taken place in European insurance and financial markets as well as in the regulation of insurance and financial groups.

18.2 Available evidence suggests that an increasing number of insurance companies are becoming parts of groups. At the same time, most decisions concerning risk management and governance of entities belonging to groups are often taken by the parent of the group. These trends highlight the importance of supplementary group supervision for the efficient and effective supervision at the legal entity (solo) level. Hence issues related to insurance groups and financial conglomerates also need to be addressed as a part of the Solvency II project although the main focus is on capital requirements and supervisory review at the level of the individual (solo) entities. Implications for the acquis communautaire in this area must also need to be considered.

\textsuperscript{130} Directive 98/78/EC.
(I) Regulatory arbitrage

Extract from the Call for Advice:

The Commission Services request CEIOPS to “analyse the scope for regulatory arbitrage\(^{131}\) in capital requirements between the same or similar financial products sold by insurance or by other financial institutions”.

Explanatory text

18.3 As outlined in CEIOPS’ February 2005 update to the Commission, the existing literature on the topic has been reviewed. With the exception of an earlier report from the Conference of Insurance Supervisors on suretyship, there is little documented material on actual cases of regulatory arbitrage. Both the Basel II and Solvency II projects seek to introduce a more risk sensitive framework. As capital charges become increasingly risk sensitive, scope for regulatory or capital arbitrage decreases.

18.4 In introducing new requirements under the proposed Minimum Capital Requirement and Solvency Capital Requirement, CEIOPS advises that due regard should be given to achieving optimal consistency and compatibility across sectors. Measures that might encourage arbitrage between institutions should not be introduced. Nevertheless, CEIOPS acknowledges that any standardised approach to designing capital requirements is a simplification based on average risk profiles of institutions, be it credit institutions or insurance undertakings.

18.5 CEIOPS envisages that comprehensive internal models, when calibrated in an appropriately harmonised way, would ultimately be able to reflect the risks most accurately. Initially, only few insurers might develop internal models. In order to prevent undertakings from using models inappropriately to lower their solvency requirements (‘cherry picking’), supervisors will use their powers under Pillar II (through the Supervisory Review Process) to address this issue in an appropriate manner.

18.6 Equally, in the case of financial conglomerates, supervisory authorities should ensure that decisions to book the same or similar products in different institutions are not based solely on any capital or other arbitrage opportunities that may arise. Appropriate supervisory action should be taken to ensure that supplementary solvency requirements are appropriately fulfilled.

18.7 CEIOPS notes that the issue of compatibility and consistency relates not only to the underlying philosophy but also involves the question of calibration.

\(^{131}\) What is being discussed here is arbitrage opportunities between different types of institutions for the same or similar products. There is no discussion here in relation to arbitrage opportunities within an institution by repackaging a product (say, by way of securitisation).
18.8 Another area where differences may arise relates to the forms of capital that banks and insurers are required to hold to meet their liabilities. CEIOPS is taking account of work currently under way in the banking sector and will address this issue in its draft answer to CfA 19.

**CEIOPS’ Advice**

18.9 CEIOPS finds that there should be consistency between transparency requirements applicable to insurance supervisors in Member States and to supervisors of different financial sectors. (CEIOPS’ Answers on the first wave of Calls for Advice, para. 146).

18.10 In principle, solvency requirements should be consistent regardless of the nature of the financial institution and adhere to the principle 'same risk, same charge'.

18.11 CEIOPS advises that recognised assets or capital to cover solvency or capital adequacy requirements should be consistent across sectors.

18.12 CEIOPS advises that, although consistency across sectors is important, this does not imply that insurance regulation should necessarily follow the approach adopted in the regulation of banking or investment firms. The European Commission and the relevant Level 3 committees should work together to ensure that appropriate consistency is achieved and maintained.
(II) Capital requirements at group level

Extract from the Call for Advice:

CfA N°18 asks in particular to address the following:

Should the IGD be applied both for the minimum capital requirement (MCR) and the Solvency capital requirement (SCR) or only for the SCR? Should also any Pillar 2 individual capital increases be taken into account? A prerequisite for the proposal for a Directive is an analysis of how supervisory actions and respective solvency control levels are to be linked (i.e. what supervisory actions are needed at group level and how and when they should be triggered by the control levels). Consequently the work carried out by the Pillar I groups regarding the "solo requirements" should be taken as a starting point for analysis.

Should the solo SCR requirements (both the standard formula and the internal model method) be amended to take into account group specificities and how? Are there important differences in risk profiles at solo and group levels (exposure to other/new risks which are not relevant on a solo basis, i.e. 'diversification costs')? (See also separate Call for Advice on solvency control levels). Do 'diversification benefits' exist as a result of the fact that the insurer is part of an insurance group? Can these costs and benefits be quantified appropriately?

The scope of an internal or partial model: is it possible to allow the use of an internal model for the SCR for only a limited number of insurers in a group (and the standard formula for the others), or should the internal model as a rule be required to be applied to all insurers in the same group? Could different (partial) internal models in the group be allowed (for practical reasons) provided they are calibrated prudently enough?

Does the IGD need amending because of possible changes in the elements eligible for the solvency margin (this will be addressed in a separate Call for Advice)?

Explanatory text

Capital requirements (SCR and MCR) at group level

18.13 The Commission’s Amended Framework for Consultation states that in Pillar I the new solvency system will contain two capital requirements: the SCR and the MCR. The SCR may not be lower than the MCR (see CEIOPS’ answer to CfA 9). The European Commission has requested CEIOPS to advise on how these concepts may be applied in a group context.

18.14 The SCR reflects a level of capital that enables an undertaking to absorb significant unforeseen losses and that gives reasonable assurance to policyholders. When an undertaking does not fulfil the SCR, supervisory action will be triggered for the undertaking to remedy the situation. The MCR reflects a level of capital below which immediate ultimate supervisory action is envisaged. The issue of solvency control
levels and supervisory instruments and action is addressed in more detail in CEIOPS’ answer to CfA 15.

18.15 The IGD requires the supplementary calculation of the adjusted solvency of insurance undertakings in an insurance group. There are no analogous requirements at group level based on the currently required guarantee fund. The calculation methods specified in the current IGD are in essence based on calculating the sums of the required and available solvency margins, adjusted for any multiple use of capital elements and inappropriate intra-group creation of capital. The Financial Conglomerates Directive (FCD)\textsuperscript{132} takes a similar approach to solvency within a financial group context.

18.16 CEIOPS notes that the calculation methods described in the IGD are deemed equivalent. This notion of equivalence may well be related to the fairly simple way in which the present solvency requirements are determined: in essence a linear function of technical provisions, capital at risk, premiums and/or claims. If the consolidated method is interpreted as being a fully integrated approach, the linear nature of the solo requirements would still imply an outcome which is equivalent to that of the other methods.

18.17 Given the intended role of the MCR and SCR, CEIOPS advises that the Framework Directive should include a SCR at group level. The Commission’s Amended Framework for Consultation states that the main focus of the Solvency II project is on capital requirements and supervisory review at the level of the individual legal entity. CEIOPS advises that within that context there is no general need for the imposition of a MCR at group level; please note, however, the role of a group MCR as a ‘floor’ to a group SCR discussed below.

18.18 The Framework for Consultation expresses the philosophy that the solvency requirements, and in particular the SCR, should properly reflect the risk profile of the insurer. The design and calibration of the SCR will be based on the assumption of a diversified portfolio of both (insurance) liabilities and assets. CEIOPS recognises that where an insurer is part of a group, diversification benefits at group level may occur. At the same time, certain additional risks, such as direct contagion risk or more indirect reputation risk, may arise in a group context. CEIOPS also notes that risks that occur in a group context\textsuperscript{133}, such as reputation risk, may be difficult to quantify. It is envisaged that the SCR may be determined via a standard formula, or through the use of a validated internal model.

18.19 CEIOPS envisages that the SCR at solo level will be determined as a function of a number of risk factors. It is foreseeable that this function, which aggregates the capital charges for the distinct risk factors at solo level, will not be of a fully linear nature. This approach would have a number of implications for the determination of SCR at group level. Most notably, the order and way in which risk factors are aggregated

\textsuperscript{132} Directive 2002/87/EC.

\textsuperscript{133} Please see the parts relating to insurance groups in Freshfields Bruckhaus Derringer, \textit{Study on financial conglomerates and legal firewalls}, 2003.
into a SCR at group level would impact on the outcome. An approach, which would firstly determine a solo SCR and then in essence sum these solo SCRs into a group SCR, would not include any diversification benefit between entities within a group. Adopting a more integrated approach and determining the group SCR via a non-linear aggregation of risk factors (similar to the solo approach), would in principle include diversification effects and might thus lead to a lower group SCR.

18.20 Most of CEIOPS members think that group diversification benefits would become transparent by using the consolidated method and not by using the other methods in the current IGD. Others disagree.134

18.21 CEIOPS stresses that further detailed analysis of this important issue of diversification, both at a conceptual level and regarding any numerical outcomes, is required and envisaged. This analysis should also address whether any risks arising at group level may lead to a possible increase of SCR at solo or group level.

18.22 CEIOPS acknowledges that insurance undertakings will be allowed to use appropriately validated partial or full internal models. CEIOPS also supports the use of internal models for the determination of SCR in a group context, subject to appropriate validation. CEIOPS advises that such use should be allowed to take various forms. The SCR of the constituent entities of a group may be determined by use of full or partial internal models. Internal models at group level may vary from a fully integrated modelling of the risk characteristics of all group entities, to a more partial approach and aggregation methodology. Further analysis, however, is also required here. The related important issue of model validation is addressed in part IV of this response.

18.23 So, the use of either the standard formula (dependent on the approach chosen), or an internal model for the group, might lead to a group SCR which in essence is lower than the sum of the solo SCRs.

18.24 The SCR may not be lower than the MCR at the solo level. The MCR thus effectively forms a floor to the SCR determined by an internal model. It is envisaged that the MCR will be determined in a straightforward and robust manner. So, in the group context, the question is whether this ‘floor’ concept can and should be applied. Furthermore, the question is whether it should only apply to the group SCR determined by an internal model, or whether it also may play a useful role as floor for the SCR at group level determined by a standard formula.

18.25 Given the uncertainty inherent to insurance and any modelling thereof, CEIOPS supports the Commission Services’ proposal to define a robustly determined floor to the outcome of an internal model derived SCR. CEIOPS would for the same reason advocate the determination of

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134 Some other members, while agreeing that the consolidation method automatically recognizes diversification benefits by calculating capital on the basis of group positions, think that this disguises them rather than making them transparent. Under the aggregation method, where benefits are not automatically recognized, supervisors would need to make a specific decision whether to recognize diversification benefits on a case-by-case basis thus increasing transparency.
a robust floor to the SCR in a group context. Given the requirement of robustness, CEIOPS advises to determine such a floor based on the addition of the relevant solo MCRs.

18.26 If the SCR at group level is determined via a standard formula allowing for diversification benefits, then it is conceivable that the group SCR could also be lower than the sum of the solo MCRs. In this context, CEIOPS would advise that the same principle should apply as described in para. 18.25 concerning internal models.

18.27 It should be noted that were the solo MCR determined in a simple linear way, comparable to the determination of the presently required solvency margin, then the group MCR would be determined directly at group level in the form of a sum of solo MCRs. This ‘floor’ group MCR would thus not allow for any diversification benefits, just as the solo MCR is less risk sensitive than the solo SCR\(^{135}\).

18.28 The method for determining and calibrating the MCR and SCR is still being discussed and CEIOPS notes that it might need to amend its advice at a later stage in the light of the outcome of that particular discussion.

18.29 CEIOPS also notes that financial groups may include entities with activities (financial or non-financial) which do not require authorisation, but which may nevertheless impact on the risk profile of the group. Further analysis is required to determine to what extent a notional capital requirement may usefully be calculated and integrated into the group capital requirement and to what extent qualitative requirements and supervisory instruments may be defined to deal with the risk resulting from such companies being part of the group.

18.30 CEIOPS notes in particular that risk factors that may lead to a diversification benefit at group level may be easier to quantify than other risks, such as legal, operational or reputation risk, that result from an insurer being part of a group. CEIOPS cautions that there may thus appear a bias towards the granting or seeking of a diversification benefit, rather than an increase of SCR at solo or group level. Hence CEIOPS stresses that the supervisory review process should pay particular attention to whether any such risks arising at group level may lead to a possible increase of SCR at solo or group level. CEIOPS foresees that, on a case-by-case basis, groups would be required to demonstrate clearly to their supervisors that their risk exposure and risk management would allow for a diversification benefits. CEIOPS envisages that this may well lead to the requirement that this be demonstrated through a validated internal model and the evidence of sufficiently sophisticated risk management. Such a model would need to quantify the risks that occur within a group context, both under average and stressed situations. Any supervisory assessment should take into account modelling uncertainty, which may offset any perceived diversification benefits.

\(^{135}\) The method for determining the MCR is still being discussed and CEIOPS notes that the outcome of that particular discussion might alter this particular line of thought.
18.31 Additionally, it must be decided if any reduction of solo requirements should be allowed due to demonstrated diversification benefits at group level. CEIOPS supports the underlying philosophy of Solvency II that solvency requirements, and in particular the SCR, should properly reflect the risk profile of the insurer. For a majority of CEIOPS members, this implies that the solo SCR should not be reduced to reflect any diversification benefits at group level which are not evident at solo level, although an alternative view has also been presented\(^{136}\). CEIOPS will develop this question further in its answer to CfA 19 (Eligible elements to cover the capital requirements). Any risks that appear at solo level as a consequence of being part of a group should be reflected in the solo SCR, to be assessed in the supervisory review process. CEIOPS also refers here to the remarks below on the effectiveness of the transferability of capital.

**Qualitative requirements at group level**

18.32 Quantitative capital requirements should be supported by and embedded in robust qualitative requirements. CEIOPS advises that this is particularly important in a group context, since a number of risks may occur within a group context that are often difficult to quantify with sufficient precision and robustness to lead to further or adjusted capital requirements at solo or group level. Such risks may arise from, inter alia, direct financial intra-group exposures, internal outsourcing or centralisation of functions, legal liability or more indirect reputation effects. The IGD provisions only partially address such risks. CEIOPS advises the Commission Services that, instead, the FCD would appear to offer a better basis for the drafting of the relevant provisions covering qualitative requirements in the Framework Directive. Comparability also in this field with the FCD would further support the aim of a level playing field in financial services. CEIOPS would in particular support the inclusion of more demanding provisions on capital adequacy policies (Art. 6 FCD), risk concentration (Art. 7) and internal control mechanisms and risk management processes (Art. 9).

18.33 In particular, the FCD explicitly requires (Art. 6) to have in place adequate capital adequacy policies at the level of the financial conglomerate. CEIOPS supports this. Supervisors should satisfy themselves that such policies are indeed in place, and that the elements eligible for the SCR are adequately distributed between the undertakings in the group. Furthermore, given the objectives of the capital adequacy rules (please also see FCD, Annex I), due regard must also be given to the effectiveness of the transferability and availability of the own funds across the different legal entities in the group. A thorough supervisory review of adherence to the quantitative requirements of MCR and SCR at solo level and of group SCR, and of the aforementioned qualitative requirements should obviate the need for a further MCR requirement at group level, other than for the calculation of an appropriate ‘floor’ at group level.

\(^{136}\) Another view is that, in principle, groups should be allowed to reflect group level diversification benefits back to their ‘solo’ entities SCR, provided they meet a certain eligibility test.
18.34 CEIOPS advises that the aim of an adequate distribution of capital within a group needs to remain a requirement.

**Elements eligible for the solvency margin and transferability of capital**

18.35 The issues outlined above also fundamentally relate to the definition of eligible forms of capital, as well as the question of transferability of capital within a group. CEIOPS will further consider these issues in its answer to CfA 19.

**Allocation of supervisory responsibilities and co-operation**

18.36 The group SCR should be an important part of the supervisory review. A breach of the group SCR should trigger supervisory action in order to ensure that the group remedies the situation. Therefore CEIOPS advises that the Framework Directive should, in addition to addressing the assessment process and responsibilities, define both the supervisory authority competent to take action and supervisory instruments available. CEIOPS will address the issue of allocation of supervisory responsibilities and supervisory instruments and powers of intervention within a group context in more detail in its response to the CfA 21 (Co-operation between Supervisory Authorities).

18.37 At this stage, however, CEIOPS advises the Commission Services that the provisions in the IGD do not suffice in this respect. CEIOPS fully subscribes to the statement in the Framework for Consultation that management decisions are increasingly being taken by the parent undertaking. Hence the relevant rules need to be set at the relevant level. As indicated, CEIOPS will further consider this in its answer to CfA 21. Nevertheless, at this stage CEIOPS advises that Section 3 of the FCD – "Measures to facilitate supplementary supervision" – will be an important input into that process. The Framework Directive should explicitly address the determination of the competent authority responsible for exercising supplementary supervision (group supervisor), the task of any such group supervisor, the co-operation and exchange of information between competent authorities, the access to and verification of information, enforcement measures and additional powers of the competent authorities.

**Institutions with a parent undertaking outside the EU**

18.38 CEIOPS also notes that the FCD addresses explicitly the situation of institutions with a parent undertaking outside the Community. CEIOPS would expect that the Framework Directive will also explicitly address this situation.
18.39 The Framework Directive should set provisions for determining a SCR at group level. There is no general need to define a group MCR as a separate trigger for supervisory intervention. Any adjustments to required solo capital following Supervisory Review Process (Pillar II) should be fully and automatically taken into account in the determination of required capital at group level.

18.40 CEIOPS stresses that further conceptual and numerical analysis is required on the issue of diversification benefits, increases in required capital, and on the processes leading to the recognition of such benefits in the determination of the group SCR.

18.41 The Framework Directive should allow and encourage the use of internal models at group level.

18.42 The group SCR determined with the aid of an internal model may incorporate diversification benefits, or additional capital charges, but should have a floor based on in essence an addition of the solo MCRs. If a standard formula for the determination of the group SCR would include diversification benefits, CEIOPS considers that the same floor concept might apply.137

18.43 CEIOPS envisages that groups will be required to demonstrate clearly to their supervisors that their risk exposure and risk management would allow for a diversification benefit on a case-by-case basis. CEIOPS foresees that this may well lead to the requirement that this be demonstrated through a validated internal model and evidence of sufficiently sophisticated risk management. Such a model would need to take into account all risks that occur within a group context and quantify them as much as possible, both under average and stressed situations.

18.44 CEIOPS is not convinced that it is possible to identify and quantify diversification benefits at a group level sufficiently accurately for them to be reflected in a reduced SCR at solo level (see draft answer to CfA 19). However, CEIOPS believes that work should continue on this question and the way left open for further recognition of diversification benefits in the future. Hence a majority of CEIOPS members hold the view that the solo SCR should not be reduced to reflect any diversification benefits at group level which are not evident at solo level. Any risks that appear at solo level as a consequence of being part of a group should be reflected in the solo SCR, to be assessed in the supervisory review process138.

18.45 CEIOPS further notes that the issues outlined above also fundamentally relate to the definition of eligible forms of capital, as

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137 The method for determining the MCR is still being discussed and CEIOPS notes that the outcome of that particular discussion might alter this particular line of thought.

138 Another view is that, in principle, groups should be allowed to reflect group level diversification benefits back to their solo entities SCR, provided they meet a certain eligibility test.
well as the question of transferability of capital within a group. CEIOPS will provide advice on this question in its draft answer to CfA 19.

Qualitative requirements

18.46 Quantitative capital requirements should be supported by and embedded in robust qualitative requirements. CEIOPS advises the Commission Services that the FCD would appear to offer a good basis for the drafting of the relevant provisions covering qualitative requirements in the Framework Directive. Comparability also in this field with the FCD would further support the aim of a level playing field in financial services. CEIOPS in particular supports the inclusion of more demanding provisions on capital adequacy policies (Art. 6 FCD), risk concentration (Art. 7 FCD) and internal control mechanisms and risk management processes (Art. 9 FCD).

Allocation of supervisory responsibilities and co-operation

18.47 CEIOPS will address the issue of allocation of supervisory responsibilities and supervisory instruments and powers of intervention deemed necessary within a group context in more detail in its answer to CfA 21 (Co-operation between Supervisory Authorities). Even so, CEIOPS advises that Section 3 of the FCD – "Measures to facilitate supplementary supervision" – will be an important input into that process.

Institutions with a parent undertaking outside the Community

18.48 CEIOPS also notes that the FCD addresses explicitly the situation of institutions with a parent undertaking outside the Community. CEIOPS would expect that the Framework Directive will also explicitly address this situation.
(III) Supervisory Review Process of groups

Extract from the Call for Advice:

Would a supervisory review process (SRP) for insurance groups need to be set up, in particular to take account of risks not existing on a solo level, but existing at a group level and that are not taken into account in Pillar I? (See also the Call for Advice on SRP)

Should supervision be applied at group level and how? What would that exactly entail including advantages/disadvantages (cf. separate Calls for Advice on supervisory powers, solvency control levels, SRP)?

Explanatory text

Aims to be pursued when supervising groups

18.49 It is not uncommon to find in the group context that it is actually the parent undertaking that lays down the business strategy, as well as sets up internal control and risk management mechanisms for the entire group. Articles 10.3 of the Recast Life Directive, as well as Art. 9.3 of the Third Non-Life Directive require insurance undertakings (solo) to have adequate internal control systems in place. The IGD does not have a complete approach to internal control, but it addresses the issue of internal control as regards supplementary supervision of an insurance group as follows:

- regarding the information needed for the purposes of calculating the adjusted solvency requirement, Art. 5.1 requires that insurance groups shall have in place adequate internal control mechanisms for the production of any data and information;

- regarding intra-group transactions, Art. 8.2 (as modified by FCD), requires that insurance groups have in place adequate risk management processes and internal control mechanisms in order to monitor and control intra-group transactions.

18.50 The FCD has a more complete approach to internal control and risk management. Article 9 sets out more specific requirements for internal control mechanisms and risk management processes.

18.51 Since a parent undertaking can exercise dominant influence on other group undertakings, including the possibility to restructure the capital of the subsidiaries, there is an unquestionable need to ensure that the same capital of the subsidiaries is not artificially used within a group to cover risks simultaneously in several group companies (double-gearing of capital).

18.52 An unregulated parent undertaking and its unregulated subsidiaries may incur similar counterparty and market risks as regulated group
undertakings, which are subject to prudential requirements to cover such risks. If such risks materialise, they are likely to affect the financial position of the separate regulated entities of the group as well. Therefore, it is necessary to ensure that the entire group, including its unregulated parts, is adequately capitalised, in addition to the individual regulated group undertakings.

18.53 Since parent undertakings are in a position to make significant decisions affecting the entire group, then, regardless of their regulated status, parent undertakings should also be subject to controls on effective shareholder control, fitness and propriety of the Management, and effective internal control and risk management mechanisms.

18.54 Group-wide supervision of groups carrying out their business under a common brand is particularly necessary because of the reputation risk to the regulated entities of the group by unacceptable policies of the parent undertaking or its other subsidiaries (contagion).

18.55 A further particularity of group supervision is that groups typically consist of several legally separate entities, while the group might not be a legal entity in itself.

18.56 In light of the increased significance of cross-border groups in Europe, at least some of the above-mentioned issues require a lot of attention being paid to so that a clearer, more consistent legal framework which can effectively be applied across different Member States in Europe can be achieved.\(^\text{139}\)

**Role of the co-ordinator in the IGD and FCD**

18.57 Article 7 of the IGD provides for the exchange of information between competent authorities, whereas Art. 4.2 grants the option of appointing one competent authority to assume responsibility for exercising supplementary supervision. Other articles in the IGD assume cooperation between supervisory authorities of insurance groups operating in more than one EEA Member State. The Helsinki Protocol (HP) describes the role of a key co-ordinator as a supervisor arranging and managing the co-ordination of the activities necessary to carry out the supplementary supervision.

18.58 CEIOPS notes that it will need to elaborate its views on any need for additional supervision at the sub-group level at a later stage. Stakeholders are nevertheless encouraged to provide their views also on this issue when responding to this consultation.

18.59 The FCD goes further in confirming the role of the co-ordinator to assume responsibility for exercising supplementary supervision. It also specifies the extent of information to be exchanged between relevant supervisors (Art. 12).

\(^\text{139}\) See Supervising European Financial Groups and Institutions, an analysis of alternative supervisory models and their legislative implications, discussion paper by Erkki Sarsa – Ministry of Finance, Finland.
In view of the need for increased collaboration between supervisors, and considering the involvement of supervisors from different sectors and different Member States, the FCD foresees the appointment of a co-ordinator among them. It also identifies which competent authorities involved should be considered relevant for the purpose of supplementary supervision at the level of the financial conglomerate (See also paras. 18.36 and 18.37).

Supervisory Review Process of groups in the Solvency II framework

There is a general agreement among supervisory authorities that the core of the Supervisory Review Process in the Solvency II framework of is to remain the supervision of the legal entity (solo supervision), carried out by competent authorities.

Notwithstanding, the European insurance landscape has changed over the past decade or so and cross-border groups in which some key functions are centralised at the level of the parent, have emerged.

The Solvency II project emphasises more on the following issues than the present system:

- fit & proper requirements;
- internal control;
- risk management.

These issues are naturally also of crucial importance at solo level, but, importantly, they can be strongly influenced by decisions taken at group level. Furthermore, Solvency II introduces the possibility to determine solo SCR with internal models, which have been so far developed by groups.

Within this background, group supervision in the new framework is an essential matter for an efficient supervision at solo level. CEIOPS considers that this will require more explicit provisions on group supervision in the future framework.

Explicit definition of groups & supervision of holding companies

Where the heads of insurance groups are holding companies, an explicit group approach for supervision would imply an inclusion of such companies in the scope of supervision. However, this raises several issues. So, the supervision of holding companies should not be identical to the direct supervision of legal entities. Therefore no licensing or authorisation process of the holding company on a stand-alone basis should be necessary.

Supervision of holding companies in the Solvency II framework only aims at enabling supervisors to require relevant reporting and information from the group, as well as checking compliance with the
requirements set at group level. These requirements concern, for instance, fitness and propriety of the group Management and the Board of the parent of the group, internal control and corporate governance.

18.68 In this context, it would seem necessary that the group Management be made responsible for compliance with group requirements. The FCD should be considered as step forward in this respect. Although the main focus remains on ensuring the financial soundness of the solo entities, the Directive nevertheless clearly states that supplementary supervision is carried out at group level, regardless of the type of parent (regulated undertaking or holding company).

**Co-ordination process & group supervisor**

18.69 Practical experience in insurance groups supervision is still fairly limited, compared to solo supervision. It however suggests that a central role for a co-ordination, in a better position to perform a number of tasks and a clear co-ordination mechanism would be welcomed. This co-ordinator could be called group supervisor, so as to indicate its central role in the co-ordination process while avoiding any reference to the existing model of supervision.

18.70 CEIOPS has been asked to make recommendations on how to set up an adaptable Supervisory Review Process (SRP) for groups. There needs to be a clear allocation of responsibilities and powers between the supervisors in the future framework, as well as enhanced provisions on co-operation and information exchange. The efficiency of the whole supervisory process of a group will strongly depend on the way each supervisor (both the group supervisor and the solo supervisors involved) performs its duties and shares its knowledge with the other supervisors involved.

18.71 The group supervisor should have an overview of the group’s situation without actually having to perform the supervision of the whole group. The group supervisor needs to be enabled to get all necessary information from the solo supervisors and/or on the solo entities within the groups through the parent. CEIOPS considers that the principle of reciprocal flow of information needs to be strongly asserted in the future Framework Directive, while the practical implementation of that principle could best be addressed at level 3 (supervisory convergence).

18.72 CEIOPS will return to the issue of information exchange in its future answer to CfA 20 (harmonisation of the Supervisory Review Process).

18.73 Furthermore, it seems worth considering whether the group supervisor should be assisted by a small team of supervisors (e.g. 'co-ordination board'). Such a structure would facilitate concerted action, and effective response in times of crisis. The composition of this possible

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140 See Art. 13 FCD on Management body of mixed financial holding companies: "Member States shall require that persons who effectively direct the business of a mixed financial holding company are of sufficiently good repute and have sufficient experience to perform those duties."
new structure would need to be defined clearly. The FCD provisions on defining relevant competent authorities could provide a useful starting point in this respect. CEIOPS will consider this issue, and especially the analysis in paras. 18.68-18.72, further in its answer to CfA 20 (co-operation between supervisory authorities141).

**Information provided by groups**

18.74 CEIOPS considers that the harmonisation or at least convergence of reporting by solo entities would be desirable, as this would provide for a better comparability of risk profiles of the solo entities within a group. In the banking sector, several projects aiming at the harmonisation of reporting have been launched.

18.75 Allowing the group to report the required information by providing one integrated main report could be very efficient both for the group and the supervisors. It would provide a good insight into the group and its constituent parts, and give a good overview of intra-group transactions and of possible risk concentration. However, special supervisory concerns may require Member States’ supervisory authorities to be entitled to collect additional data or information from the supervised entities.

18.76 CEIOPS will further consider these issues in its answer to CfA 21 (Supervisory reporting and disclosure).

### CEIOPS’ Advice

18.77 CEIOPS advises that the Framework Directive should include explicit provisions on the supplementary supervision of groups, since most decisions on risk management, internal controls and the use of internal models are often taken by the parents of groups.

18.78 CEIOPS advises that the Solvency II framework should include further supplementary high-level aspects on Supervisory Review Process for groups. This is in addition to CEIOPS’ recommendation in its answer to CfA 2.

18.79 For these purposes, CEIOPS recommends to follow the spirit of the FCD so as to explicitly define insurance groups in the future framework.

18.80 Supplementary supervision at group level should not imply that supervisors should necessarily directly supervise holding companies on a stand-alone basis142. In this regard, supplementary supervision should be defined in a uniform way so as not to distinguish between the various legal forms of the parent undertaking (e.g. whether the parent of the insurance group is an insurance undertaking, holding

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141 CEIOPS-CP-06/05.

142 Regarding this point, Article 5.5 and Art. 13 of the Directive 2002/87/EC might be taken as examples.
company or any other structure.

18.81 CEIOPS considers that the FCD which clearly defines the role of the different authorities involved in supervision has been a positive development and the Solvency II framework should reflect this. At this stage CEIOPS has not yet examined the alternative approach of following the banking model of full consolidated supervision structure.

18.82 CEIOPS considers that there is need to define a group supervisor in the Framework Directive. This group supervisor would be responsible for the implementation of the Supervisory Review Process of the group according to group wide requirements. Notwithstanding, it is important to note that the competent authority responsible for the supervision of solo undertaking will also be the authority responsible for the SRP of that entity. The group supervisor should work jointly with the supervisors of the solo entities of the group.

18.83 Regarding the measures of intervention and the powers assigned to the group supervisor, CEIOPS advises to explicitly provide such powers in the Framework Directive. These powers will have to have regard to any trigger levels determined elsewhere (both at solo and group levels), and on the supervisory action derived from these trigger levels.

18.84 Beyond the explicit provisions in the future Framework Directive, CEIOPS advises to consider allowing flexibility in the group supervisor’s responsibilities so that it can consider all relevant issues that might have an impact on the group solvency.

18.85 Assessment of the adequacy of group capital should be the responsibility of the group supervisor. Please also see CEIOPS’ recommendations on the validation of internal models (part IV of this answer).

18.86 Furthermore, the group supervisor would be responsible, in close cooperation with the solo supervisors, for verifying compliance of the following qualitative requirements at group level (Pillar II):

a) governance, Risk Management and Internal Control

b) risks that are taken into account in Pillar I, but may be not sufficiently reflected in the Pillar I formulas (standard formula as well as internal models).

The SCR formula will include the major quantitative risk categories. But it is likely that some risk aspects will need to be considered additionally in Pillar II in a qualitative way. These risk aspects may also need to be specifically reflected in the group context as well. Therefore it seems necessary for supervisors to assess group level compliance with the actual risk profile of the qualitative risks requirements.

18.87 To achieve the goal of an efficient supervision of groups, the principle of reciprocal information exchange needs to be strongly asserted in the
future Framework Directive. CEIOPS will further consider this issue in its answer to CfA 20.

18.88 The competent authorities should have the power to impose an additional capital requirement at group level that has in place insufficient capital, inadequate arrangements, processes, mechanisms or strategies for the management and coverage of their risks.

(IV) Validation of internal models

Extract from the Call for Advice:

Validation process for internal models (see also separate Call for Advice on this topic): which supervisor(s) is/are responsible for the validation of the internal model, how to ensure efficient cooperation of supervisors, what additional requirements should be set for a group level model compared to a solo model etc.

Explanatory text

18.89 CfA 11 raises specific issues for consideration by CEIOPS: These issues concern the following:

- Proposed Article: “The solvency capital requirement may be calculated by an undertaking’s own internal model after validation and approval by the competent authorities. The risk measure, the time horizon and the scope of risks covered must not be less prudent than in the standard approach. Detailed compliance criteria for undertakings wishing to use internal models will be established in implementing measures.”

- The Commission Services would like CEIOPS to give technical advice on appropriate EU standards for calculating the SCR by an internal model and on the compliance criteria for model validation and approval by the supervisor.

This answer seeks to address issues that may arise in the case of model validation for insurance groups.

18.90 In the insurance sector, quantitative partial models have mainly been used for pricing and provisioning, and it is only recently that undertakings have begun to attempt to model the risk profile of the entity for both management and solvency purposes. To date, evidence would suggest that, at least in the initial stages (due to complexity, cost or lack of experience among others), models will be specifically designed at group level.
18.91 The absence of full consolidated supervision for insurance groups raises a number of challenges for insurance supervisors when it comes to validation or approval of the aforementioned models. For example, there is currently no legally charged supervisor who is responsible for supervision at group level. Rather there is a sharing of these responsibilities amongst all the supervisors of the group's entities. This would suggest that the proposed solution in the banking sector i.e. that the consolidating supervisor will have the final say in model validation, will not work in the insurance sector. Moreover, it is stated in the Solvency II framework that solo supervision remains the bedrock of insurance supervision. This means that each supervisor will need to be satisfied not only in relation to the way the model works in practice, but also, and in particular, in relation to the relevance of the model for those insurance undertakings that fall within their Member State and the ability of that specific company to be able to use the model both in terms of skill and data requirements.

18.92 The Commission foresees a review of the current system of supervision of insurance groups, and CEIOPS shares the opinion that an approach towards the system recognised in the FCD would be a step forward. It would imply a series of changes, namely providing the group supervisor with additional competences and responsibilities. However, this approach needs to be compatible with the stated aim of the Commission of building the future solvency framework with solo supervision being the cornerstone of the whole supervisory system, to emphasise the continued core role of the solo supervisor.

18.93 Also, the EU Commission should bear in mind the potential complexity of modelling risks in insurance, due to both the lack of past experience and the underlying difficulties of insurance risk (underwriting, long time horizon...etc.), where up to date no generally agreed model has been developed.

143 On the other hand, strong compelling reasons has been expressed to follow the proposed Article 129 of CRD.

CRD Art. 129:
1. The competent authority responsible for the exercise of supervision on a consolidated basis of EU parent credit institutions and credit institutions controlled by EU parent financial companies shall carry out the following tasks: (a) supervisory overview and assessment of compliance with the requirements laid down in Articles 71, 72(2), 72(2) and 73(3); (b) coordination of gathering and dissemination of relevant or essential information in going concern and emergency situations; (c) planning and coordination of supervisory activities in going concern as well as in emergency situations, including in relation to the activities in Article 124, in cooperation with the competent authorities involved, and in relation to Articles 43 and 141.
2. In the case of applications for the permission referred to in Articles 84(1), 87(9) and 105, respectively, submitted by an EU parent credit institution and its subsidiaries, or jointly by the subsidiaries of an EU parent financial holding company, the competent authorities shall work together, in full consultation, to determine whether or not to grant the permission sought and to determine the terms and conditions, if any, to which such permission should be subject. An application as referred to in the first subparagraph shall be submitted only to the competent authority referred to in paragraph 1. The competent authorities shall in single document agree together, within no more than six months, their determination on the application. This document shall be provided to the applicant. In the absence of a determination within six months, the competent authority referred to in paragraph 1 shall make its own determination on the application.

144 MARKT/2505/05-EN, page 2, Group Issues: “the allocation of responsibilities of supervisors involved in group supervision needs to be reviewed, in particular in connection with the use of internal models”.
Model validation in the context of insurance entities is a much more complex question than in banking. Firstly, banking supervisors have long recognised modelling of market risk and model validation is subject to a wide range of established quantitative and qualitative criteria, whilst in insurance there is limited experience in the use of integrated models. Secondly, while credit risk modelling is a more recent phenomenon, the number of inputs, the time horizon and data on loss experience raise less complex hurdles than that for risks faced by insurance companies, and there are important underlying differences, e.g. the definition given to the event that determines default. Thirdly, market and credit risk models can be designed for special niche entities or portfolios within a banking group.

In general, there should be little or no difference of approach between sectors in terms of model validation. The collegiate model proposed in the banking sector forms a sound basis for the approach in insurance, although the aforementioned particularities of the supervision of insurance groups suggest that in case supervisors cannot reach an agreement, different solutions may be considered (instead of just assuming the one in banking, where the group supervisor would impose his criteria in case of lack of consensus, after a 6 month period). Should the approaches not be convergent between sectors, it is possible that it will give rise to anticompetitive consequences and increased scope for regulatory arbitrage.

The approach should have regard to both the resource implications for supervisors and the potential costs to industry. For this reason, the group supervisor would be best placed to deal with all the initial stages of model validation i.e. assessing the risk measures, the time horizon and the scope of risks covered. The group supervisor could be assisted by other supervisors within the group structure where this is considered necessary but it is suggested that contact with the insurance undertaking would be between it and the group supervisor, thus avoiding unnecessary burden as much as possible. The group supervisor should then share and discuss the information with other supervisors.

It is at the second phase of the assessment where all supervisors within the group would have additional input i.e. developing the detailed compliance criteria for the use of the model within the group. Here, the detailed knowledge of local supervisors as to the governance, skills base and data availability within their authorised entity, as well as the specificities of the local market, would be essential, so local supervisors should in all cases validate the specific assumptions that refer to their individual undertaking and market. In terms of compliance criteria there is no 'one size fits all' solution. While the possible future implementing measures may set out detailed minimum criteria to be fulfilled each group will pose its own idiosyncrasies that will require to be addressed by all supervisors within a group. Moreover, it may be the case that different entities within an insurance group will be at different stages of development. This raises the issue of partial use of a model within a group. It may be the case that only some group entities are sufficiently sophisticated to use the group
model and others will have to use the standard approach – this decision will, in the first instance, have to be taken by each individual supervisor.

18.98 Issues that need to be addressed in model validation at group level include –together with all the issues relevant at solo level-, but are not limited to:

- the predictive power of the model;
- the use test i.e. that the model is used by Senior Management as a tool for calculating and allocating economic capital, both at group and at solo level;
- the different assumptions chosen in the concrete model, that need to be in line with the real risk profile of the insurance group, the solo undertaking and their particular circumstances and relationships;
- the data inputs i.e. that the data are sufficiently robust and reliable and that they are representative of all significant risks that the model is designed to measure;
- data oversight i.e. that there is a system in place to constantly review and assess data inputs and quality;
- model validation (by the insurer) i.e. the insurer monitors model performance and stability; reviews model specification; and tests model outputs against outcomes;
- governance: all material aspects of the model and its use are agreed upon (and understood) by the Board of Directors.

**CEIOPS’ Advice**

18.99 CEIOPS advises that the supervisor with responsibility for parent undertaking of the group or the group supervisor should lead the process for validation and approval of use of group models\(^{145}\). The group supervisor should disseminate all relevant information pertaining to the model to all other supervisors in the group.

18.100 All supervisors in the group may have input into the validation process.

18.101 All supervisors in the group will input to the compliance criteria.

18.102 In general models approved at group level will be used throughout the group. However decisions as to the adjusted solo SCR requirement ultimately rest with the supervisor who has legal responsibility for the solo entity. In case the supervisor of a solo undertaking considers that

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\(^{145}\) See draft answer to CfA 20.
the assumptions used in the model related to this undertaking are not valid, he should provide the group supervisor with the findings and reasons why he considers that an add-on to the result of the model is necessary. The group should be allowed and encouraged to tailor its model to these criteria in order for the model to be validated. The cooperation process for the validation of internal models and the resolution of possible dispute will be developed in the answer to CfA 20.

18.103 Calculation of the adequacy of group capital will remain the responsibility of the group supervisor, subject to the specific rules for capital allocation determined by the EU.

18.104 Capital should, regardless of the use of internal models, be distributed adequately within the group, to ensure that sufficient capital is available at solo level.

CEIOPS’ general Advice on the amendments to IGD

18.105 As a result of these developments, it appears that the current framework for the supplementary supervision of groups will have to move towards a different model within the Solvency II context. In effect, the above developments show that, following CEIOPS’ advice, the future legislation will need to:

- explicitly define groups, in the spirit of the FCD, which is necessary to address properly the challenges raised by Solvency II;
- include proper requirements raised by the Solvency II framework (concerning the calculation for SCR at group level, the supervisory review process at group level, the validation of internal models in a group context)

18.106 So, there would appear to be a clear need to amend the IGD, although how this should be done is a separate issue. In this respect, CEIOPS considers there to be possible significant difficulties to amend the current IGD article by article. In fact, given the extent to which the current insurance acquis needs to be amended in light of the Solvency

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Another view is that Article 129 CRD forms a useful basis for developing a decision-making process adequate for insurance groups. The precise cooperation and mediation process for the validation of internal models and the resolution of possible dispute should be developed in the answer to CfA 20. If the competent supervisors cannot agree on an internal model within the mediation phase, the group supervisor’s decision would be binding for all solo supervisors.

However, CEIOPS recognizes that the legal responsibilities between group and solo supervisors must be balanced carefully. Given that compliance with the MCR and ground floor for internal models (see CfA 9, para. 9.117) on solo level ensures that subsidiaries remain adequately capitalized. Additional add-ons under the Pillar II process would be possible to be set by solo supervisors for identified risks outside the scope of the internal model that has been approved.
II project, it would seem preferable to adopt an alternative approach and entirely recast the current IGD. This would appear to be a more efficient approach, as well as help in ensuring consistency.

18.107 Moreover, to have a global view of the interdependencies between group and solo supervision and in order to facilitate the implementation of the Lamfalussy procedure, the Solvency II project would seem to be a good opportunity to consider the opportunity of having a single directive for the insurance sector (including both solo/group level).
Annexes

Annex A (Call for Advice No. 16)

Role of the actuarial function

A.1 The application of appropriate expertise is a key component in the management of insurance undertakings, both in life and non-life insurance. The evolution towards a risk oriented approach and a risk sensitive capital requirement gives the actuarial function within the company more relevance and responsibilities. Given this, insurers should be required to have actuarial expertises, disregarding whether the model in use is 'responsible actuary', advisory actuary model or any other model.

A.2 In a responsible actuary approach it is expected that the actuarial function is exercised by a person acting as a front-line controller of prudential financial management. Nevertheless the existence of responsible actuary does not diminish the responsibility of the Board of Directors.

A.3 The actuary’s responsibility in an advisory actuary model would be to give a professional opinion based on his skills, his experience and, if applicable, his compliance with the Code of Conduct of his association. It is clear that the responsibility for decisions always rests with the Board of Directors.

Fit and proper issues

A.4 The appointment of a responsible actuary should be subject to supervisory review and the supervisor should have the powers to have an unsatisfactory appointee removed from the position.

A.5 The term actuary should not be limited to members of an actuarial society. The term actuary should cover all persons who are knowledgeable and have relevant experience. Criteria for an actuary may include:

- Qualified by specified initial and ongoing educational requirements;
- Membership in the local professional body at an appropriate level;

When using the word "actuarial" in the draft answers and annexes it is not CEIOPS’ intention to specify the use of professional actuaries. The concept is used to describe a specific function applying statistical-mathematical methods developed for the use in insurance undertakings.
• A minimum specified period of relevant practice as an actuary since qualification at that level.

A.6 The requirements regarding who could be appointed as a responsible actuary are always defined in the supervisory rules or legislation.

A.7 The actuary should always be subject to the general fit and proper requirements that are applicable at management level.

Approaches

A.8 Depending on the Members States the supervisory authority can opt between two different models regarding the use of actuaries:

• Responsible actuary approach;
• Advisory actuary approach

A.9 In the responsible actuary approach an individual has official responsibilities towards both the insurance company and the supervisory authority or a defined role set out in the insurance regulation. In the advisory actuary approach the actuary acts as an adviser of the Board of Directors. In both approaches the actuary can be an employee of the company or an external consultant.

A.10 The decision on the use of a responsible actuary in an official capacity as part of a supervisory method should give due regard to the need to ensure effective supervisory oversight and management accountability.

A.11 In the case of the responsible actuary approach it is necessary to establish some rules regarding the link with the company in order to avoid conflict of interests.

A.12 The actuaries’ duties and qualifications would be slightly different for Life and Non-Life and depending on his/her role in each Member States. Nevertheless it must be kept in mind that the line between the two approaches cannot so sharply drawn in all Member States. E.g. in several Member States, the responsible actuary has the responsibility to carry out an annual valuation of the technical provisions, but he/she does not have the duty to whistle-blow to the supervisor or to report non-compliance with the regulation. He/she is not seen as a front-line controller of the supervisory authority.

Responsible actuary approach

A.13 In a responsible actuary approach the actuary is required to carry out an annual valuation of the liabilities of the insurance business.

A.14 The link to the insurance supervisor is established through the legislative duty to 'whistle-blow', to the Board of Directors and the insurance supervisor, if the management of the insurer insists on
pursuing a strategy which the responsible actuary believes may have a serious adverse impact on the insurer.

A.15 To avoid any situations of conflict of interest where the actuary's role is focused on external reporting (for instance in producing reports on which policyholders might rely or in assisting external auditors in discharging their duties), he/she is not allowed to be a board member or a chief executive officer.

A.16 Where a responsible actuary approach is in place, consideration should be given to whether disclosing requirements should be imposed on actuaries. The responsible actuaries should be obliged to report non-compliance with legislation or rules established by the insurer. The existence of such obligations may both increase the confidence of the supervisor and provide a direct link between supervisors and actuaries.

A.17 A consequence of the first option is that the responsible actuary would also have the duty to certify the adequacy of the tools used to compute the fair value of provisions or to assess the solvency position such as ALM models and internal models. Under this approach the responsible actuary is expected to act as a front-line controller of prudential financial management, whose responsibility has to be spelled out in legislation and direct requirements of the insurance supervisory authority.

A.17 Under the second option, the supervisor looks to the actuary within an insurance company as a particular contact person for supervisory questions and issues of an actuarial nature. Where a responsible actuary approach is in place, there should be some criteria regarding who may qualify for appointment as a responsible actuary. These criteria may be based on qualifications or professional experience as well as a combination of these elements. In addition, factors such as the personal and professional ability to function in the position should be considered.

A.18 Where the use of a responsible actuary approach is adopted, the supervisor should not simply accept the work of the actuary without further scrutiny, but should have access to actuarial resources to review and interpret the advice of the responsible actuary.

Advisory actuary approach

A.19 The supervisor looks at the undertaking's actuary as a particular point of reference for asking supervisory questions and for the resolution of issues that it wishes to discuss with the insurer.
Actuarial function

General principles

A.20 The actuarial function requires an understanding of the stochastic nature of insurance, the risks inherent in assets and in the use of statistical models.

A.21 Actuarial methods are used to assess risk, determine the adequacy of premiums (tariffs) and establish technical provisions for both life and non-life insurance. These methods include a detailed understanding of the probabilities of insurance risks, (e.g., mortality, morbidity, claims frequencies and severities), the use of statistical methods, the use of discounted cash flows, understanding and assessment of the use of derivatives and an understanding of volatility and adverse deviation.

A.22 The actuary should make an assessment of:

- the overall policy of underwriting;
- the claims management procedures;
- the overall investment policy and management;
- the overall reinsurance and other risk mitigation policy and management;
- IT systems

Specific principles for life insurance

A.23 The actuary, taking into account the terms and conditions of insurance contracts as well as the investment policy, should give advice on:

- the terms and conditions of insurance contracts;
- the adequacy and sufficiency of the level of premiums to be charged;
- the adequacy of technical provisions in sufficient detail for the Board of Directors to decide where within a range of reasonable estimates the technical provisions should be set and whether the calculation of the solvency position is based on realistic assumptions;
- the adequacy of reinsurance arrangements; and
- the determination of the allocation of profits, distributions or bonuses to participating policies.
Specific principles for non-life insurance (excluding long-term health and/or disability)

A.24 The actuary, taking into account the terms and conditions of insurance contracts as well as the investment policy, should give advice on:

- the adequacy of technical provisions in sufficient detail for the Board of Directors to decide where within a range of reasonable estimates the technical provisions should be set and whether the calculation of the solvency position is based on realistic assumptions;
- the adequacy and sufficiency of the level of premiums to be charged;
- the adequacy of reinsurance arrangements; and
- the adequacy of risk control, particularly by means of claims statistics.

A.25 The analyses to be carried out must, to the extent deemed appropriate, be grouped by insurance classes, risk categories, types of products or any other combination that the actuary considers to be appropriate.

New aspects of actuarial work in the new solvency regime

A.26 The role of actuarial function is changing so that co-operation with risk management and investment activities and even accounting is more crucial.

Report of the actuary in a responsible actuary approach

A.27 In a responsible actuary approach the actuary must elaborate an annual report with the findings and recommendations. This report must be drawn up with clarity and suitable objectivity, in order to comply with the obligation to provide information.

A.28 The actuary must attempt to be consistent in the way reports are drawn up and presented in order to guarantee the possibility to compare information over time.

A.29 If, after the date of submission of the reports, the appointed actuary detects the existence of errors in the information contained therein considered to be of material relevance for the purposes of the conclusions obtained, the actuary shall carry out the corrections he considers appropriate, which should be submitted to the supervisory authority.

A.30 The actuary should undertake detailed monitoring of the measures taken by the insurance undertaking in the pursuit of the recommendations made by him in his reports.
A.31 The analyses to be carried out must, to the extent deemed appropriate, be grouped by insurance classes, risk categories, types of products or any other combination that he considers to be appropriate.

A.32 The information to be included in the report of the appointed actuary should be sufficient in order to enable another actuary to formulate an opinion on the analyses made.

A.33 The report should contemplate the following content, without prejudice to other notes of appraisal that he decides to include given the insurance undertaking’s specific situation.

**General comments on the insurance classes under analysis**

A.34 The appointed actuary should carry out, in general terms, the evaluation of the set of information obtained from the insurance undertaking and/or external auditor, in particular, in relation to the following aspects:

- claims management procedures;
- investment policy;
- reinsurance policy and other forms of transfer and reception of risks;
- risks identified from a broad risk management perspective;
- risk acceptance policy (to the extent elements of this policy have an impact on the establishment of technical provisions); and
- IT procedures.

**Quality of the information used**

A.35 The actuary should issue an opinion on the structure of data used in the analysis and indicate the respective sources of information and should, whenever this is justified, indicate any inconsistencies found.

A.36 The appointed actuary should indicate whether he carried out any revision of the data obtained, presenting the procedures used in this verification, and/or whether, for the purposes of verification of reliability of the information, he considered the work already carried out by the external auditor of the insurance undertaking.

A.37 Whenever the appointed actuary considers that it is necessary to carry out any adjustments or corrections in the information available, due justification and the criteria adopted should be presented.
Conformity, suitability and sufficiency of the premiums

A.38 Responsibility for these aspects remains with the Board of Directors of the insurance undertaking. The actuary should confirm that an analysis undertaken in order to verify the suitability, sufficiency and conformity with prevailing legislation of the premiums practiced by the insurance undertaking in relation to the insurance classes under analysis.

A.39 The actuary should confirm that the analysis to be carried out by the actuary should take into consideration the factors that may affect commercial exploitation of the class of insurance, including all direct or indirect income and costs, in particular:

- claim costs to be borne by the insurance undertaking, including adjustments that may be introduced to these costs;
- the costs resulting from signature of insurance contracts in particular brokerage and mediation commissions (acquisition costs);
- the costs resulting from the management of insurance contracts, in particular costs related to the collection of premiums, administration of the insurance portfolio (administrative costs), together with costs associated with investment management;
- the results arising from reinsurance treaties signed, together with other risk transfer and reception contracts;
- the financial results resulting from the investment policy of the insurance undertaking;
- any other costs that may lead to obligations resulting from insurance contracts.

A.40 The actuary should confirm that the analysis presents an evaluation of the commercial discount policy practiced by the insurance undertaking, stating his opinion on the implications that this policy may have in terms of the sufficiency of premiums.

A.41 The actuary should also confirm that the analysis contains a description of the analyses carried out in order to evaluate the appropriateness of the premium rates charged by the insurance undertaking. In this context, the actuary should confirm that the analysis takes into consideration different hypotheses, contemplating different future scenarios.

A.42 In relation to the motor insurance class, the actuary should also issue a statement on any bonus-malus system practiced by the insurance undertaking, making a statement on the suitability of this system given the undertaking’s portfolio, together with its implications in terms of the sufficiency of insurance premiums.

A.43 In relation to the Life assurance class, the actuary should also confirm that the analysis contains a description of the present analysis
undertaken in relation to the sufficiency of the premiums of the new products launched in the year, with reference to the specific characteristics of the product (in particular guarantees and options) and make a statement on the suitability of the hypotheses used (in particular the interest rate, mortality tables, surrender rate and management costs).

**Suitability and sufficiency of technical provisions**

A.44 The actuary should describe the provisions policy of the insurance undertaking and should describe in detail all methodologies and procedures used in order to enable him to examine compliance with prevailing norms and verify the sufficiency of technical provisions.

A.45 The actuary should present and justify the methodologies considered and the hypotheses on which he based his analysis carried out and also objectively identify the amounts of the various technical provisions subject to certification. This should include the disclosure of the best estimates and the risk margins, by presenting the values and the methodologies used in a separate way.

A.46 When prevailing regulations require use of specific hypotheses, and if in the opinion of the actuary these materially differ from those that, in other circumstances, he would normally take into consideration, he should issue his opinion, providing due grounds and indicating the implications of this consideration.

A.47 Whenever possible, and provided that this can be justified by the materiality criteria, the analysis should be carried out by means of a subdivision of the existing data into homogeneous and stable classes, obtained for example, by taking into consideration the patterns of claims occurrence, patterns of regularization and/or severity of claims.

A.48 The models considered in analysis of the claims provision should take into consideration the nature and specific characteristics of the portfolio, available data, together with other factors that should be subject to suitable analysis, in particular:

- evolution of the pattern of payments;
- evolution of the frequency and severity of claims;
- experience of the insurance undertaking on incurred but not reported claims;
- policy for the claims regularization, in particular in terms of the speed of closure and reopening of proceedings;
- existence of significant reimbursement or salvage amounts;
- frequency and severity of major claims;
• existence of significant insufficiencies in the provisions established for previous years;
• management claims costs;
• impact of possible agreements in existence between the insurance undertaking and other insurance undertakings or service providers.

A.49 The actuary should explicitly state which analysis he carried out and which models he used in order to verify the sufficiency of the incurred but not reported claims.

A.50 When the studies carried out by the actuary contemplate any case-by-case based investigation, the sampling criteria considered should be specified.

A.51 When the analysis undertaken by the actuary includes verification of the calculation algorithms used by the computing system of the insurance undertaking, this fact should be stated and indication should be made of the procedures used in this verification.

A.52 When, for the purposes of the verification specified in the previous paragraph, the actuary takes into consideration work already undertaken by the external auditor of the insurance undertaking this fact should be indicated.

A.53 Whenever the actuary has considered hypotheses and/or models that differ from those used in the analysis that served as the basis for the report drawn up for the previous financial year, he should state this fact, justifying the changes made and describing, whenever this is considered to be materially relevant, the impact of the results arising from such alterations.

A.54 The actuary should also present a comparison of the estimates obtained for the technical provisions with the corresponding estimates present in the report on the previous financial year, presenting explanations for any significant differences found.

A.55 The appointed actuary should also present the sensitivity analyses carried out in order to assess the degree of uncertainty of the estimates obtained for technical provisions. In this context, the actuary should take into consideration different hypotheses and/or classes of evaluation models, contemplating different future scenarios.

A.56 When there is a significant difference in the results obtained by means of consideration of different hypotheses and/or models, the actuary should make a comment on these differences, and also justify the estimate that is considered most appropriate.

A.57 The actuary should make a comment on the suitability of the mortality tables used in order to determine the mathematical provision of life assurance policies, in particular insurance policies offering lifelong income and pensions resulting from occupational accidents, and should
present a comparison between expected and actual mortality rates in
the last three years. Whenever there are significant deviations in these
rates, he should measure the impact of the use of mortality tables that
are better adjusted to the experience and perspectives of evolution of
mortality rates of the insured population.

A.58 In relation to the life assurance class, explicit reference should be made
to whether or not options or guarantees exist in current contracts that
lack due provisions and which may affect the financial stability of the
insurance undertaking.

A.59 The actuary should also issue a statement on the procedures used in
order to carry out matching between assets and liabilities and
additionally issue a further statement on the investment policy
especially in the face of securing the objective of securing of the
liabilities. The opinion presented should include, in particular, a
comment on the hypotheses used in future cash flow projections,
corresponding to either the liabilities assumed by the insurance
undertaking, or the assets assigned to these liabilities.

Assessment of profit-sharing systems

A.60 The actuary should describe the procedures used in the verification of
the suitability of sharing plans of profits by nature and the specific
characteristics of the product/modality and its correct application, and
also state his opinion on the coherence and inter temporal consistency
of the policy of allocation of investments across the various products
and the suitability of the policy governing use of the fund for future
provisions.

A.61 The aforementioned analysis should take into consideration compliance
with stabilization objectives in terms of profit sharing over time and
equity in the treatment of insured persons in function of their
respective contribution to these profits.

Analysis of the solvency situation

A.62 The actuary should make a statement on the insurance undertaking’s
constitution of the solvency margin and, whenever this proves to be
appropriate, should describe the results of the sensitivity results carried
out in order to project the future evolution of the margin.

A.63 If any of the sensitivity tests carried out describe an evolution course of
the results that may lead to a future situation in which the solvency
margin may be insufficient, the actuary should also describe the tests
carried out in relation to changes in the level of premiums,
management costs and investment and provisions policies, that on a
joint or isolated basis, may ensure that resources return to a suitable
level in order to satisfy prevailing regulatory requirements in relation to
solvency. The responsible actuary should indicate the implications of it
not being possible to implement such changes and the factors which
may make implementation impossible in practice.
A.64 In the tests undertaken, the actuary should, for the purposes of the percentage of the reinsurance assignment to be considered, take into consideration the quality of the reinsured persons and the nature of reinsurance treaties.

Conclusions and recommendations

A.65 The actuary should summarize his conclusions and make the recommendations that he considers appropriate, and also communicate the measures taken in the wake of recommendations made in previous years.
Modelling approaches to the main risk categories under the SCR standard formula

Underwriting risk in life insurance

Factor-based approach to mortality, lapse and expense risk

B.1 The modelling approaches to be used in the SCR standard formula require considerable further analysis. This annex gives a first indication of possible approaches, but the examples outlined should be considered purely illustrative at this stage.

Underwriting risk in life insurance

Factor-based approach to mortality, lapse and expense risk

B.2 A factor-based approach to underwriting risk requires

- to specify the volume measures that are specific to underwriting risk;
- to determine the coefficients applicable to these volume measures;
- to specify the degree of ‘personalisation’ that should be reflected in the coefficients; and
- to clarify how the approach chosen may be combined with a segmentation of the book of business of the insurer.

Choice of volume measures

B.3 Considering the split between mortality, lapse and expense risk, and the different nature of these three sub-risks, it seems advisable to choose three volume measures for underwriting risk, i.e., one measure specific to mortality risk, one to lapse risk and one specific to expense risk.

- Mortality risk

B.4 With regard to mortality risk, depending on the product design, two natural candidates for a volume measure are the technical provision, if the risk of longevity is relevant, and the capital at risk for term insurance at the beginning of the solvency assessment time horizon.

B.5 The valuation of the technical provision for the purposes of calculating capital requirements for underwriting risk should be compatible with
the rules on the calculation of the technical provisions to be developed as part of the future solvency framework (cf. CfA 7 – technical provisions in life insurance).

B.6 If the technical provision is defined as a sum of the best estimate and a risk margin that reflects the volatility of the claims, it may also be possible to choose the best estimate as the volume measure. However, such a choice would need to be reflected in the degree of volatility that is taken into account in the definition of the coefficient applicable to the volume measure.

- Lapse risk

B.7 With regards to lapse risk there are two primary effects of unanticipated lapse rates. The first involves the payment of surrender or termination values. The relationship of the amount of a surrender payment to the value of the liability being held in respect of a particular policy is of great importance. When a policy lapses the insurer pays the surrender value and 'receives' the actuarial reserve that is released by the policy’s termination. If surrender values are lower than policy reserves, the insurer is at risk from lapse rates that are lower than expected, particularly if high lapse rates were anticipated in the pricing of a product. The case that surrender values exceed policy reserves results in higher lapse rates being unfavourable to the insurer. However, if according to IAIS, technical provisions must not be lower than surrender values, there is no risk in an increase in lapse rates.

B.8 The second primary effect of unanticipated lapse rates is that the insurer may not realise the expected recovery from future premiums of initial policy acquisition expenses. These acquisition expenses may be recognized implicitly in financial statements through the use of modified net level premium valuation methods. These implicit methods currently do not include any provision for un-favourable variations in lapse rates. Under a best estimate plus a risk margin valuation approach these unfavourable variations should be partly included in the risk margin.

B.9 A capital requirement with respect to the first type of lapse risk (cf. B. 7) requires the division of an insurance company’s policies into two classes: first those policies for which the technical provisions TP are greater than surrender values S, and second those policies for which S > TP. This suggests choosing S–TP and TP–S, as volume measures for the first type of lapse risk.

B.10 For the second type of lapse risk (cf. B.8), the technical provision seems to be the appropriate volume measure. Within a best estimate plus a risk margin valuation approach the technical provision will need to include a provision for the impact of unfavourable variations in lapse rates on the expected recovery of the acquisition expenses.

- Expense risk

B.11 A detailed understanding of the insurer’s expense structure and expense drivers is a key element when determining the expense risk.
Using a prospective valuation approach of assets and liabilities means that all possible future cash flows will have to be identified and valued. Expenses that will have to be made in future to service an insurance contract are one of those cash flows for which a provision will have to be calculated.

B.12 The IAA observes that the insurer normally selects assumptions with respect to the future expenses associated with obligations arising from commitments the entity has made on, or prior to, the valuation date, including overheads. When setting expense assumptions, it may be useful to differentiate between:

- the entity’s strategy for determining the level of service provided to policyholders (and its approach to claims management, if applicable); and
- the entity’s efficiency in providing that level of service and (implementing its approach to claims management, if applicable).

B.13 Usually all future administrative costs and consequent commissions would need to be considered. Where future deposits or premiums are factors in the determination of the liabilities, expenses related to the deposits or premiums would usually be taken into consideration. In addition, where appropriate, the expenses of administering investments normally would be taken into consideration too.

Choice of coefficients and degree of personalisation

B.14 A choice of coefficients within a factor-based model for underwriting risk needs to reflect the use of a limited (one year) time horizon, but with full allowance for changes in the expectation over that period of future cash flows to be reserved for at the end of that period. It is to be based on an analysis of the insurers’ underwriting result during the time horizon; a loss of capital occurs if the underwriting result is negative.

B.15 The underwriting result of the insurer will strongly depend on the valuation of the technical provisions. The principles for this valuation in the context of the calculation of the capital risk charge for underwriting risk should be compatible with the rules on the calculation of the technical provisions to be developed as part of the future solvency framework.

B.16 To simplify, it is assumed that the time horizon is one business year. The forthcoming business year (at the point of time of the solvency assessment) is referred to as the current year. The risk charge for underwriting risk is therefore derived from the properties of \( UR_{\text{Technical}}^{\text{Technical}} \), the underwriting result of the undertaking in the current year, which is regarded as a random variable.

B.17 One can assume that the risk capital charge for underwriting risk is determined according to ruin probability \( \alpha \) and risk measure \( \rho_{1-\alpha} \). For example, one may choose \( \rho_{1-\alpha} = \text{VaR}_{1-\alpha} \) for Value-at-Risk, or \( \rho_{1-\alpha'} = \)
TVaR\(_{1-\alpha}\) for Tail Value-at-risk. In this context, \(1-\alpha\) or \(1-\alpha'\) correspond to the confidence level ensuring the degree of prudence, that CEIOPS wishes to achieve.

B.18 The risk capital charge for underwriting risk is given by

\[
RC^{\text{technical}} = \rho_{1-\alpha}(UR^{\text{technical}})
\]

For example, a ruin probability of 0.5\% and a VaR risk measure would correspond to

\[
RC^{\text{technical}} = \rho_{1-\alpha}(UR^{\text{technical}}) = VaR_{99.5\%}(UR^{\text{technical}}) = q_{99.5\%}(-UR^{\text{technical}})
\]

so the risk capital charge is the 99.5\(^{\text{th}}\)-quantile of the distribution – \(UR^{\text{technical}}\), or the smallest value of RC that satisfies the inequality – \(UR^{\text{technical}} \leq RC\) with a probability of at least 99.5\%.

In case of the risk measure TVaR and a ruin probability of, e.g. 0.8 \% the risk charge for underwriting risk would be the average loss in the worst 0.8 \% cases:

\[
RC^{\text{technical}} = \rho_{1-\alpha'}(UR^{\text{technical}}) = TVaR_{99.2\%}(UR^{\text{technical}})
\]
B.19 The underwriting result can be split into the three subcategories:

\[ UR_{\text{technical}} = UR_{\text{mortality}} + UR_{\text{lapse}} + UR_{\text{expense}} \]

- Mortality risk

B.20 Expressing the capital charges in terms of the volume measures \( TP_0 \) and \( CR_0 \) (the technical provision and the capital at risk\(^{148} \) at the beginning of the current year), one has that

\[ RC_{\text{mortality}} = \max(\beta \times TP_0, \gamma \times CR_0) \]

where

\[ \beta = \rho_{1-a}(UR_{\text{mortality}} / TP_0) \quad \text{and} \quad \gamma = \rho_{1-a}(UR_{\text{mortality}} / CR_0) \]

 denote the quantile of the (relative) mortality result in the current year, expressed in percentage of the corresponding volume measure at the beginning of the current year.

- Lapse risk

B.21 Regarding a capital requirement with respect to the first type of lapse risk the insurance company’s policies should be divided into two classes: those policies for which technical provisions \( TP \) are greater than surrender values \( S \), and those policies for which \( S > TP \).

B.22 The capital requirements would then be of the form:

\[ RC_{\text{lapse}} = j \times (TP_0 - S_0), TP_0 > S_0 \]
\[ RC_{\text{lapse}} = k \times (S_0 - TP_0), TP_0 < S_0 \]

respectively, for appropriately chosen factors \( j \) and \( k \).

- Expense risk

B.23 A methodology for determining the expense risk capital requirement could involve looking at the expenses of a company in aggregate and simply estimating the capital charge as

\[ RC_{\text{expense}} = t \times E_{\text{total}} \]

where \( t \) is an appropriately chosen factor and \( E_{\text{total}} \) is the provision for all expenses that will have to be made in future to service an insurance contract.

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\(^{148}\) Capital at risk denotes the difference between the payment falling due when the contract is triggered and the technical provision for that contract.
Degree of personalisation

B.24 Translating these theoretical equations into a factor-based, standardised formula requires:

- analysis at the level of individual undertakings; and
- generalised analysis that can be applied across the industry.

In the following paragraphs, are further analysed these two steps further, considering mortality, lapse and expense risk separately.

- Mortality risk

B.25 Defining $UR_{\%\text{mortality}}$ as the quotient of $UR_{\text{mortality}}$ and the corresponding volume measure $TP_0$ or $CR_0$, it can be seen that on an abstract level one needs to choose the coefficient $\beta$ or $\gamma$ applicable to CEIOPS’ volume measure as

$$\beta = \rho_{1-a} (UR_{\%\text{mortality}}) \quad \text{or} \quad \gamma = \rho_{1-a} (UR_{\%\text{mortality}})$$

respectively, where $\rho$ is a given risk measure and $a$ is the ruin probability.

B.26 In general terms, to be able to compute the coefficient $\beta$ according to the formula in the preceding paragraph, one needs to know the probability distribution of the random variable $UR_{\%\text{mortality}}$. On a practical level, it may be assumed that this distribution is of a type that is completely specified by its first two moments. Then $\beta$ may be determined once the following has been specified

- the type of the distribution;
- its expected value $\mu$; and
- its variance $\sigma^2$.

B.27 Assuming that the type of distribution of $UR_{\%\text{mortality}}$ is set by the supervisor, the determination of its expected value and variance allows for a wide range of approaches, which vary in their degree of personalisation:

- all parameters are set by the supervisor; the result would be a table of industry-wide factors $\beta$ and $\gamma$ for mortality risk that can be applied to the insurers’ provisions in each segment; or
- the expected value and/or variance of the distribution are computed using company-specific data; or
- the expected value and/or variance of the distribution are computed using a mixture of company-specific data and data which is set by the supervisor.
The decision about the degree of personalisation requires a trade-off between accuracy and practicability of the determination of the risk within the limits of the standard formula.

B.28 The third alternative is an intermediate approach that uses limited portfolio specific data to measure the portfolio specific risk in a reliable and practicable way. For example, the variance of the distribution may be regarded as a function of the size of the portfolio:

$$\sigma^2(UR^{\text{mortality}}_{\%}) = f(n).$$

B.29 The function $f$ would be provided by the supervisor and the size $n$ of the portfolio would be determined individually by the insurer. The size of the portfolio could be measured, for example, by the number of risks in the portfolio at the beginning of the time horizon. This approach would combine an assumption on the volatility of the distribution which is specific to the homogenous risk group and independent of the single company with the diversification effects caused by the size of the portfolio which is specific to the company. This approach has been chosen by the Dutch supervisory authority for the Financial Assessment Framework.

B.30 The reliability and practicability of the determination of the coefficient $\beta$ will depend on the rules for the valuation of technical liabilities within the solvency assessment framework. Therefore, it seems premature to make a definite advice on the degree of personalisation at this stage.

- **Lapse risk**

B.31 Given the practicability of the determination of the coefficients for lapse risk $j$ and $k$ could be set by the supervisor; the result would be a table of industry-wide factors $j$ and $k$ for lapse risk that can be applied to the insurers’ provisions in each segment.

- **Expense risk**

B.32 The same applies for expense risk the coefficient $t$ could be set by the supervisor; the result would be a table of industry-wide factors $t$ for expense risk that can be applied to the insurers’ provisions in each segment.

**Aggregation**

B.33 Mortality, lapse and expense risk may be analysed on the basis of homogenous segments of the portfolio to take the particularities of the single segments into account. Such a segmented approach to underwriting risk would present the problem of how to aggregate individual risk charges. Simply adding up the individual charges would neglect diversification effects between different homogenous risk groups. This may lead to an overestimation of the required risk capital.
There are two approaches to deal with this problem:

- one may determine mortality (or lapse/expense) risk capital charges for each segment and calculate the overall mortality (or lapse/expense) risk capital charge using capital aggregation methods; or

- one may determine only the first two moments of the distribution of the mortality (or lapse/expense) risk for each segment and calculate the first two moments of the overall mortality (or lapse/expense) risk using a correlation matrix for the second moments. Assuming the overall mortality (or lapse/expense) risk to have a specific two-parametric probability distribution, one may then calculate the overall mortality (or lapse/expense) risk capital charge.

The Dutch Financial Assessment Framework and the IAA, for example, follows the first approach. The advantage of this approach is that for the calculation of the capital charges of the single segments the underlying probability distribution of the risk can be chosen according to the particularities of the segment. The disadvantage of this approach is that a standardised aggregation of the risk capital charges of the segments is problematic. To be in a position to aggregate them in a mathematically precise manner, the complete dependence structure of the risks has to be known. This is rarely the case.

According to the second alternative, it is not necessary for the supervisor to set a probability distribution for the risk on the level of the individual segment. This may help to reduce the model error of the determination of the risk capital, since the moments of the risks can be aggregated precisely once the linear correlations between those risks are known. Moreover, it may be easier to make an adequate assumption on the type of the distribution on the level of the diversified overall risk than on the level of the segment risk. On the other hand, this approach takes only the first two moments of the probability distribution on the segment level into account.

**Scenario techniques as a supplement to factor-based approaches**

- **Catastrophic underwriting risk**

A factor-based approach to modelling underwriting risk is based on certain probabilistic assumptions on the frequency and severity of claims. Typically, a parametric family of distributions is chosen to model the future occurrence of loss. Parameters are fitted to statistical data that is collected from historical experience. The major part of such claims experience relates to 'normal' circumstances, where a certain regularity and smoothness in claims patterns may be observed. Extreme or irregular events may either be absent from the data, or may have to be 'smoothed out' in the calibration process. By nature of their construction, factor-based models may be less able to predict extreme, catastrophic events.
One response to this issue might be the provision of a separate treatment for catastrophic underwriting risk. For example, the analytic model underlying the Swiss Solvency Test is supplemented by scenarios to capture the impact of extreme events.

Scenarios may be used to model extreme events where the assumptions of the analytic model break down, or to take into account risks that are not covered by analytic models – particularly systemic risk. Mixing two different techniques may actually reduce modelling risk associated with a standard formula.

Possible scenarios include:

- severe epidemic (e.g., Spanish Flu in 1918);
- natural catastrophe (e.g., earthquake); and
- terrorist attack (e.g., events of 9/11).

A more restricted range might be applied to take account of relative data availability. For example, one might include periodic natural catastrophes and epidemic, but exclude extreme, episodic events, such as terrorist activity.

Taking account of extreme events implies a degree of domestic variability to reflect climatic and geographical differences. Given such specificities, it may be questioned whether underwriting risk scenarios are a plausible candidate for Pillar I. An alternative might be to require undertakings to define and test their own scenarios that could then be reviewed under Pillar II. This would offer alternatives to the imposition of capital charges – for example, the development of risk mitigation programmes. However, the credibility of the standard formula might be undermined if quantifiable, highly-visible (albeit extreme) risks are not addressed in Pillar I.

- **Lapse risk**

For the assessment of lapse risk a pre-specified stress test can easily be applied. The capital requirement is of the form of the difference between a special valuation of policy liabilities and the normal valuation. For the special valuation, the lapse assumption is multiplied by a specified factor greater or less than one. Since for some policies an increase in lapse rates will result in an increase in policy liabilities, and for other policies liabilities will increase when assumed lapses decrease. As an example, in Canada, lapse rates are doubled for policies in the first class and reduced by one-half for those in the second class.

A lapse case, which cannot be addressed in a factor-based approach are those products for which lapse risk does not act uniformly over the products life, such as lapses at early durations which may reduce the company’s exposure to later risks for some policies and not for others.
**Segmentation**

**B.44** In general terms, an assessment of underwriting risk involves an identification of factors that influence the variability of the underwriting result of the undertaking. This requires a classification of underwriting risks into groups with similar characteristics, known as homogenous risk groups. This classification must be based in part on information from historical data on the liabilities portfolio, the institution’s specific circumstances and relevant data from the insurance industry.

**B.45** The life underwriting risk groups to be used need further examination. It is advisable to identify these groups on an European level but national specificities resulting in country-specific groups may be taken into account. A suitable segmentation of the book of business might be explicitly defined within the formula, or some flexibility could be allowed so that national particularities can be taken into account. A standard classification that is more closely aligned with actual undertakings behaviour should have positive consequences for risk management.

**Other issues**

**B.46** Other issues that require further analysis include:

- ability to reflect an underlying TailVaR risk measure;
- the treatment of guarantees and options;
- anti-selection (lapse rates, option take-up rates, etc.);
- morbidity and disability risk;
- interaction effects (e.g. between lapse and mortality);
- variations in sums assured; and
- mortality improvement and trend risks.

**Underwriting risk in non-life insurance**

**Mathematical framework for assessing underwriting risk**

**B.47** In the following paragraphs, some basic notation for the quantification of underwriting risk under a factor-based approach is introduced. The aim here is to make both the discussion of an underwriting risk treatment more transparent and also to provide a link with the general design of the SCR standard formula.

**B.48** To simplify, CEIOPS assumes that the time horizon is one business year. The forthcoming business year (at the point of time of the solvency assessment) is referred to as the current year. The risk charge for underwriting risk is therefore derived from the properties of
**UR** \( \text{technical} \), the underwriting result of the undertaking in the current year, which is regarded as a random variable.

B.49 Excluding investment yields on claims provisions and premiums, one can say that:

\[
UR^{\text{technical}} = PCY - ECY - IL^C_Y + RunOff
\]

where:

- \( PCY \) = earned premiums in the current year;
- \( ECY \) = expenses related to the current year;
- \( IL^C_Y \) = incurred losses for claims arising in the current year;

and

\( RunOff \) = claims provision run-off result in the current year.

Here, earned premiums are defined as written premiums adjusted by the change in premium provisions, comprising both the provision for unearned premiums and the provision for unexpired risks.

B.50 Clearly, the split between premium risk and reserve risk corresponds to:

\[
UR^{\text{technical}} = UR^{\text{premium}} + UR^{\text{reserve}}
\]

where:

\[
UR^{\text{premium}} = PCY - ECY - IL^C_Y
\]

i.e. the part of the underwriting risk relating to future claims arising from coverage provide on existing contracts; and

\[
UR^{\text{reserve}} = RunOff
\]

is the part that relates to reserve risk.

B.51 It is assumed that the risk capital charge for underwriting risk is determined according to ruin probability \( \alpha \) and risk measure \( \rho_{1-\alpha} \). For example, one may choose \( \rho_{1-\alpha} = \text{VaR}_{1-\alpha} \) for Value-at-Risk, or \( \rho_{1-\alpha} = \text{TVaR}_{1-\alpha} \) for Tail Value-at-risk. In this context, \( 1-\alpha \) corresponds to the confidence level, or level of prudence, that CEIOPS wishes to achieve.

B.52 The risk capital charge for underwriting risk is given by:

\[
RC^{\text{technical}} = \rho_{1-\alpha}(UR^{\text{technical}}).
\]

For example, a ruin probability of 1% and a VaR risk measure would correspond to

\[\text{The risks associated with investment yields on claims provisions and premiums may be considered in the context of market risk.}\]
$RC_{technical} = \rho_{1-\alpha}(UR_{technical}) = \text{VaR}_{99\%}(UR_{technical}) = q_{99\%}(-UR_{technical})$. 

So in this case the risk capital charge is the 99th-quantile of the distribution $-UR_{technical}$, or the smallest value of $RC$ that satisfies the inequality $-UR_{technical} \leq RC$ with a probability of at least 99%.

**B.53** Considering premium and reserve risk separately, risk capital charges can be defined as

$$RC_{premium} = \rho_{1-\alpha}(P^{CY} - (E^{CY} + IL^{CY})) \quad \text{and}$$

$$RC_{reserve} = \rho_{1-\alpha}(\text{RunOff})$$

where:

- $RC_{premium}$ = the risk capital charge for premium risk;
- $RC_{reserve}$ = the risk capital charge for reserve risk.

**B.54** Expressing these charges in terms of the volume measures $P^{CY}$ and $PCO_0$ (the provision for claims outstanding at the beginning of the current year), one has that

$$RC_{premium} = \rho_{1-\alpha}(1 - CR^{CY}) \times P^{CY} \quad \text{and}$$

$$RC_{reserve} = \rho_{1-\alpha}(\text{RunOff}^{\%}) \times PCO_0$$

where

$$CR^{CY} = (E^{CY} + IL^{CY}) / P^{CY}$$

is the combined loss ratio of the insurer in the current year and

$$RunOff^{\%} = \text{RunOff} / PCO_0$$

is the (relative) run-off result, expressed in percentage of the outstanding provision at the beginning of the current year.

**B.55** Translating these theoretical equations into a factor-based, standardised formula requires:

- analysis at the level of individual undertakings; and
- generalised analysis that can be applied across the industry.

In the following paragraphs, these two steps are analysed further, considering reserve risk and premium risk separately.
**reserve risk**

B.56 Using the notation introduced in CEIOPS’ mathematical framework, it can be seen that on an abstract level one needs to choose the coefficient $\beta$ applicable to CEIOPS’ volume measure $PCO_0$ as

$$\beta = \rho_{\alpha - \alpha}(RunOff_{\%}),$$

where $\rho$ is a given risk measure and $\alpha$ is the ruin probability.

B.57 In general terms, to be able to compute the coefficient $\beta$ according to the formula in the preceding paragraph, one needs to know the probability distribution of the random variable $RunOff_{\%}$. On a practical level, it may be assumed may assume that this distribution is of a type that is completely specified by its first two moments. For example, one may assume that $RunOff_{\%}$ follows a shifted lognormal, or gamma, distribution. Then $\beta$ may be determined once the following has been specified:

- the type of the distribution;
- its expected value $\mu$; and
- its variance $\sigma^2$.

B.58 Assuming that the type of distribution of $RunOff_{\%}$ is set by the supervisor, the determination of its expected value and variance allows for a wide range of approaches, which vary in their degree of personalisation:

- all parameters are set by the supervisor; the result would be a table of industry-wide factors $\beta$ for reserve risk that can be applied to the insurers’ provisions in each segment; or
- the expected value and/or variance of the distribution are computed using company-specific data; or
- the expected value and/or variance of the distribution are computed using a mixture of company-specific data and data which is set by the supervisor.

B.59 The decision about the degree of personalisation requires a trade-off between accuracy and practicability of the determination of the risk within the limits of the standard formula.

B.60 The first alternative can be compared with the actuarial studies used to calibrate the 'enhanced capital requirement' in the United Kingdom\(^{150}\) and the NAIC’s Risk Based Capital model in the United States\(^{151}\).

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The second alternative was chosen in the Swiss Solvency Test. Here, the insurer has to estimate the variance of the run-off result RunOff. On the basis of this estimation, and assuming a lognormal distribution, the capital charge is calculated. This approach would make a high demand on the insurer as far as his actuarial skills are concerned, and may be too ambitious for the standard formula.

The third alternative is an intermediate approach that uses limited portfolio specific data to measure the portfolio specific risk in a reliable and practicable way. For example, the variance of the distribution may be regarded as a function of the size of the portfolio:

$$\sigma^2(\text{RunOff} \%) = f(n).$$

The function \( f \) would be provided by the supervisor and the size \( n \) of the portfolio would be determined individually by the insurer. The size of the portfolio could be measured, for example, by the number of risks in the portfolio at the beginning of the time horizon. This approach would combine an assumption on the volatility of the distribution which is specific to the business line and independent of the single company with the diversification effects caused by the size of the portfolio which is specific to the company. This approach has been chosen by the Dutch supervisory authority for the Financial Assessment Framework\(^{152}\) and by the IAA in the ultimate loss approach.

**- premium risk**

Using the notation introduced in CEIOPS’ mathematical framework, it can be seen that on an abstract level one needs to choose the coefficient \( \gamma \) applicable to CEIOPS’ volume measure \( P^{CY} \) as

$$\gamma = \rho (1 - CR^{CY}),$$

where \( \rho \) is a given risk measure and \( \sigma \) is the ruin probability.

Similar to the case of reserve risk, the coefficient \( \gamma \) depends on the stochastic properties of the random variable \( CR^{CY} \). Again assuming, on a practical level, that this distribution is of a type that is completely specified by its first two moments, \( \gamma \) may be determined once the following has been specified:

- the type of the distribution;
- its expected value \( \mu \); and
- its variance \( \sigma^2 \).

This specification can differ in the degree of company-specific information that is evaluated.

The level of premium risk strongly depends on the expected value of the combined ratio $CR^{CY}$. An estimated combined ratio above one increases the risk by the estimated loss, whereas an estimated combined ratio below one decreases the risk by the estimated profit. Since insurers tend to differ in the expected value of the combined ratio of their business, it seems advisable to personalise this parameter of $CR^{CY}$. This could be achieved by estimating the expected value of the combined ratio of the insurer by using the historical ratios.

As to the personalisation of the variance of the combined ratio, a number of different approaches seem possible. The determination of the variance may be left completely, partly or not at all to the insurer. The decision requires a trade-off between accuracy and practicability of the determination of the variance within the limits of the standard formula.

A completely company-specific determination of the variance would make a high demand on the insurer. It would require the insurer to observe the volatility of the relevant business for a long period of time and to make an actuarial analysis on those data. This approach may not seem feasible for the standard formula.

The opposite approach would be to uniformly fix the assumed variance of the combined ratio of a business line for all companies. This option has been chosen in the UK solvency regime. It would not take into account the differences between the insurers in the volatility of their combined ratios. In particular, the standard formula would not differentiate between the volatility of large and of small portfolios.

An intermediate approach would be to determine the variance of the combined ratio by referring to data which are partly specific to the company and partly independent from the company. For example, the Swiss Solvency Test assumes that the probability distribution of the loss ratio follows a compound poisson distribution. Given a coefficient of variation for the claim size, the insurer may calculate the coefficient of variation of the loss ratio by estimating the expected number of claims of its portfolio.

While this approach is quite ambitious, a more pragmatic attempt to personalise the determination of the variance is to regard the variance as a function of the size of the portfolio:

$$\sigma^2(CR^{CY}) = f(n).$$

The function $f$ would be provided by the supervisor and the size $n$ of the portfolio would be determined individually by the insurer. The size of the portfolio could be measured by the number of risks in the portfolio at the beginning of the time horizon. This approach would combine an assumption on the volatility of the combined ratio which is specific to the business line and independent of the single company with the diversification effects caused by the size of the portfolio which is specific to the company. This approach has been chosen by the
Dutch supervisory authority for the Financial Assessment Framework and by the IAA in the ultimate loss approach.

**Incorporation of scenario outcomes**

B.73 For each scenario \( (S_i) \), one would need to specify:
- the probability of occurrence \( (p_i) \); and
- the impact on the underwriting result \( (c_i) \).

B.74 The impact should take into account risk mitigation techniques, such as reinsurance. This may be difficult, particularly in the case of non-proportional reinsurance.

B.75 Supposing that the risk capital charge for underwriting risk is given by

\[
RC^{\text{technical}} = \rho_{1-a}(UR^{\text{technical}})
\]

where all terms are as defined previously, and the random variable \( UR^{\text{technical}} \) follows distribution function \( F \), one can
- calculate the shifted distribution of \( F \), if scenario \( S_i \) was to occur, such that \( F_i(t) = F(t+c_i) \);
- define \( G \) to be the probability-weighted average of the shifted distribution functions \( F_1...F_n \) and \( F_i \); and
- recalculate \( RC^{\text{technical}} \) assuming that \( UR^{\text{technical}} \) follows distribution \( G \).

B.76 The 3-step 'shifting technique' allows CEIOPS’ assumptions on probability and severity of scenarios to be incorporated in a pragmatic way, but it represents just one possible approach. Instead of assuming a simple shift of the underlying \( UR^{\text{technical}} \) distribution, one might also consider changes in the shape of the distribution resulting from the scenarios themselves.

B.77 An alternative approach to incorporate the results of scenario testing is used in the domestic model employed in Finland. Certain extreme events are directly incorporated within a factor-based model, although undertakings themselves are required to define and perform stress tests for 'supercatastrophes.' These consider the impact across all business segments under an assumption of partial reinsurance failure. The result is a supplementary capital charge under Pillar I.

B.78 A more straightforward approach might be to require a separate catastrophe provision rather than (or in addition to) a capital charge. Also, risk mitigation achieved by pooling arrangements for e.g. natural catastrophes might offer an alternative to capital requirements.
**Segmentation**

B.79 In general terms, an assessment of underwriting risk involves an estimation of the variability of the underwriting result of the undertaking. This requires underlying data that are sufficiently homogeneous with respect to emergence, development and statistical pattern of claims. For a heterogeneous product, such as commercial multi-peril or miscellaneous liability insurance, experience may be segregated into more homogeneous groupings.

B.80 A suitable segmentation of the book of business might be explicitly defined within the formula, or some flexibility could be allowed so that national particularities can be taken into account. The ongoing relevance of the present EU classification\(^{153}\) requires further consideration with stakeholders. A standard classification that is more closely aligned with actual undertaking behaviour should have positive consequences for risk management.

B.81 Both premium and reserve risk may be analysed on the basis of homogenous segments of the portfolio to take the particularities of the single segments into account. Such a segmented approach to underwriting risk would present the problem of how to aggregate individual risk charges. Simply adding up the individual charges would neglect diversification effects between different lines of business. This may lead to an overestimation of the required risk capital.

B.82 There are two approaches to deal with this problem:

- one may determine premium (or reserve) risk capital charges for each segment and calculate the overall premium (or reserve) risk capital charge using capital aggregation methods; or

- one may determine only the first two moments of the distribution of the premium (or reserve) risk for each segment and calculate the first two moments of the overall premium (or reserve) risk using a correlation matrix for the second moments. Assuming the overall premium (or reserve) risk to have a specific two-parametric probability distribution, one may then calculate the overall premium (or reserve) risk capital charge.

B.83 The Dutch Financial Assessment Framework, for example, follows the first approach. The advantage of this approach is that for the calculation of the capital charges of the single segments the underlying probability distribution of the risk can be chosen according to the particularities of the segment. The disadvantage of this approach is that a standardised aggregation of the risk capital charges of the segments is problematic. To be in a position to aggregate them in a mathematically precise manner, the complete dependence structure of the risks has to be known. This is rarely the case.

B.84 The Swiss Solvency Test follows the second alternative. According to

\(^{153}\) The insurance classes defined in the First Council Directive 73/239/EEC.
this alternative, it is not necessary for the supervisor to set a probability distribution for the risk on the level of the individual segment. This may help to reduce the model error of the determination of the risk capital, since the moments of the risks can be aggregated precisely once the linear correlations between those risks are known. Moreover, it may be easier to make an adequate assumption on the type of the distribution on the level of the diversified overall risk than on the level of the segment risk. On the other hand, this approach takes only the first two moments of the probability distribution on the segment level into account. But within the limitations of the standard formula, it may be adequate to model the risk on the segment level only by its first two moments and therefore choose the second approach.

Market risk

Equity risk

B.85 In a factor-based approach to modelling equity risk, share values may be assumed to follow a lognormal distribution. Its mean value (yield) and standard deviation (volatility) can be derived from historical data and, if appropriate, be modified so as to allow for the current market situation and trends. The risk factor then would be a suitable quantile (e.g. 0.5 %) of the chosen lognormal distribution.

B.86 In a scenario based approach, given the overall equity position, the institution must ascertain the effect on the surplus of the value change described below in the benchmark used.

B.87 To ascertain the capital charge for equity risk in a scenario approach, the relevant risk position consists of the value of all long and short positions in shares and all financial instruments whose value is influenced wholly or partly by share prices, such as options, futures, convertibles, equity notes and total return swaps. Liabilities from unit-linked insurance and the assets covering them are to be considered simultaneously when determining the relevant risk position.

B.88 The scenario for equity risk may distinguish between shares listed on mature markets, emerging markets shares and private equity (unlisted shares). From empirical observations, the two latter categories are riskier than the former. For example, a fall of 40% may be assumed for mature markets shares and 45% for emerging markets shares and private equity.

B.89 To derive an overall capital charge for equity risk, the outcomes for the three subcategories may be aggregated using linear correlation techniques. However, this would need to reflect the empirically observed (and theoretically expected) high level of positive correlation between these three types of share.
Property risk

B.90 Changes in value of real estate may be modelled using a factor-based approach, where the risk factors are calibrated according to a lognormal distribution. Its parameters (yield and volatility) can be derived from suitable market indices. Risk capital is deduced in the same way as for equity.

B.91 Alternatively, a scenario-based approach could be used to model property risk. For the total real estate position, and taking account of the investment policy, the institution has to determine the effect on the surplus of a fall of for example 20% in the real estate benchmark used. The position in real estate is the value of all long and short positions in real estate and all financial instruments, such as real estate derivatives, whose value is influenced wholly or partly by the value of real estate.

B.92 Under any approach, the standard formula may not distinguish between direct and indirect real estate in the real estate portfolio or the real estate investment subcategories for reasons of simplicity.

Interest rate risk

B.93 Interest rate risk exists for all investments and liabilities whose value is sensitive to changes in the term structure of interest rates or interest rate volatility. In any event, these are fixed-income investments, insurance liabilities, and financing instruments (loan capital) and derivatives with a value dependent on interest rates. The value of investments and liabilities sensitive to interest rate changes may be established from the (prescribed) term structure of interest rates (‘zero rates’). This term structure can, of course, change over the period of a year.

B.94 The value of the changes in the risk free interest rate could be modelled with some interest rate model which should be chosen according to the criterion of predictive power. The parameters of such a model would be fixed by supervisors using historic time series and allowing for current market assessments. One possibility may be the Cox-Ingersoll-Ross model whose parameters are the drift (mean reversion factor), the volatility and the mean reversion level (long term average). Then the development of the long term risk free interest rate is given by

$$dr = \kappa(\mu - r)dt + \sigma \sqrt{r}dW,$$

where $W$ denotes a Brownian motion. For determining the required risk capital movements of the yield curve may be analysed including parallel shifts, twists at the short end and fluctuations in the middle range. For simplicity, parallel shifts are considered and the change in interest rate is chosen to be the difference between the current level and the quantile (0.5 % for a drop, 99.5 % for a rise) of the distribution with respect to the time horizon of one year.

154 Other interest rate models, such as the Black-Karasinski model, may also be appropriate.
In a scenario-based approach, the aim of the interest rate stress test is to establish the sensitivity of the surplus to movements in the term structure and the desired solvency for interest rate risk derived from it. The stress test to be computed relate to a general 'rise' and 'fall' in the term structure of interest rates as used to discount the insurance liabilities.

The value of the liabilities and investments is again determined comprehensively, assuming the prescribed higher or lower term structure of interest rates. The scenario with the largest loss has to be computed. This applies to both scenarios if it cannot be said with certainty in advance whether an interest rate increase or fall is the more unfavourable for the financial position of the institution. The change in the surplus (difference between the value of the investments and the value of the liabilities) is established for each scenario. The greatest loss is included when determining the capital charge for interest rate risk.

Yield curves movements (rising and falling) for the standard formula may be prescribed. Two aspects may have to be taken into account in determining the stress tests. Firstly, the volatility in 'zero rates' for long periods is relatively less than for short periods. The higher the initial 'zero rate', the larger the expected change. Both characteristics are commonly observed empirically.

Alternatively, a factor-based approach could be used to model interest rate risk. The concept of modified duration may be applied for the actual assessment. Following a drop in interest rates (negative), both the market values of fixed income securities and the value of liabilities increase. The capital requirement to cope with the interest rate shock amounts to

$$ SCR = \max[0, -\Delta \cdot (TP \cdot D_{TP}^{\text{mod}} - MV_{FI} \cdot D_{FI}^{\text{mod}})], $$

where $MV_{FI}$ denotes the market value of fixed income securities, $TP$ the value of the liability, $SCR$ the risk capital, $D_{TP}^{\text{mod}}$ the modified duration and $\Delta$ the drop in interest rates. The indices refer to technical provisions ($TP$) and fixed income ($FI$).

For a rise in interest rates, the concept of modified duration yields the capital requirement

$$ SCR = \max[0, \Delta \cdot (MV_{FI} \cdot D_{FI}^{\text{mod}} - TP \cdot D_{TP}^{\text{mod}})], $$

Since a drop and a rise in interest rates cannot occur simultaneously, risk capital should be taken as the maximum of both.
**Currency risk**

B.101  (Currency risk relates to bonds, real estate and liabilities and will be considered, provided a given threshold on the basis of current values is exceeded. Due to difficulties in denomination, further analysis is needed to determine whether currency risk of shares should be addressed.)

B.102  Currency risk could be addressed through a scenario-based approach. For the total foreign currency position, and taking account of the applicable investment policy, the institution has to determine the effect on the surplus of a fall in value of all other currencies against the euro of for example 25%.

B.103  Alternatively, in a factor-based approach, risk factors may be derived for different currencies assuming normal distributions.

**Risk concentrations**

B.104  Concentration effects could be taken into account by adjusting risk factors or increasing volume measures. Since concentration results in more 'dangerous' distributions, adjusted risk factors might be based on higher moments (e.g. skewness). For the sake of simplicity of the standard formula, however, the choice of increasing volume measures appears more practicable. For example, a certain percentage of the amount of bonds of a single issuer which exceeds a given limit might be added to the corresponding volume measure.

**Credit risk**

B.105  A combination of rating agency analysis (to establish the ratings buckets) and market information (reflected in the credit spread) could be used to model credit risk. A separate credit spread multiplier could be applied for each rating bucket. An example of such an approach has been chosen by the FSA:

\[
C_i = \sqrt{CS_i} \times Dur_i \times \text{Factor}_j
\]

where:

\[
\text{Dur}_i = \text{the duration of corporate bond } i; \text{ and}
\]

\[
\text{Factor}_j = \text{multiplier for rating bucket } j, \text{ to which corporate bond } i \text{ has been assigned.}
\]

\[
CS_i = \text{The credit spread for corporate bond } i
\]
As an alternative one could take the following approach: The risk factor is derived from a variable that represents rating quality, like a probability of default (PD) estimate. The PD estimate could be backed out of credit spread data or rating information, whichever is deemed more reliable in the specific segment. Next, a credit portfolio risk model - like the single risk factor model of Gordy\textsuperscript{155}, or the beta-distribution model of the GDV - could be used to convert the PD into a capital requirement. This capital requirement could be corrected for tenor by applying a maturity correction. In the end the results of these steps can be combined in a single table or formula.

If no credit rating exists, alternatively, an approach could be developed using only credit spreads to reflect the market's perception of credit quality. Higher credit spreads will be more volatile and therefore should result in a higher capital requirement. The maturity of an exposure will also determine the effect of credit spread changes on the value of surplus.

The simplest form uses a fixed factor on the credit spread of an instrument. Capital requirements could be approximated by using the standard first-order Taylor approximation of the relative change in bond value.

\[ C_i \approx CS_i \times Dur_i \times \text{Factor} \]

where:

\( C_i \) = the capital charge for corporate bond \( i \);

\( Factor \) = the fixed factor prescribed by the supervisor;

\( Dur_i \) = the duration of corporate bond \( i \); and

\( CS_i \) = the credit spread for corporate bond \( i \).

For example, with a fixed factor of 0.6 a corporate bond with duration of 5 years and a credit spread of 80 basis points would lead to a capital requirement of 2.4% of the bond’s market value.

\textsuperscript{155} Journal of Finance, not to be confused with the factor based approaches as described elsewhere in this document.
Operational risk

B.110 In the banking sector, the CRD offers two factor-based methods for the calculation of operational risk requirements, namely:

- the basic indicator approach (BIA); and
- the standardised approach (TSA).

B.111 The BIA uses a measure of gross income as a proxy for the scale of an undertaking’s operations, and therefore the likely scale of operational risk exposure. A fixed percentage is applied to the undertaking’s average positive income over the previous three years.

\[ K_{BIA} = \frac{\alpha}{T} \times \sum_{t=1}^{T} GI_t \]

where:

- \( K_{BIA} = \) the capital charge under the basic indicator approach;
- \( GI_t = \) Annual gross income in year \( t \) (where positive) over the previous three years;
- \( T = \) the number of previous years for which the gross income is positive; and
- \( \alpha = \) the industry-wide level of the indicator, set at 15% by the Basel Committee on Banking Supervision.

B.112 The TSA applies different factors to eight different business lines, varying from 12 to 18%.

\[ K_{TSA} = \frac{\sum_{i=1}^{3} \left( \max \left( 0, \sum_{t=1}^{8} GI_{i,t} \times \beta_{i,t} \right) \right)}{3} \]

156 Alternative treatments are available for commercial and retail banking, subject to certain conditions.
where:

\[ K_{TSA} = \text{the capital charge under the standardised approach}; \]

\[ GI_{i,t} = \text{annual gross income for year } t \text{ in business line } i \]

\[ \beta_i = \text{the industry-wide level of the indicator for business line } i, \text{ set by the Basel Committee on Banking Supervision} \]

B.113 The TSA also allows for 'negative capital charges' in any business line (resulting from negative gross income) to offset positive operational risk capital charges in the business as a whole.8%.
Annex C (Call for Advice No. 15)

Solvency control level: results of the survey on failures and near misses

Introduction

The survey on actual failures and near misses was performed by the CEIOPS in spring 2005. Of CEIOPS’ members, 17 participated in the survey. The aim of the survey was to develop conclusions for determining solvency control levels and to draw up advice based on the results of the survey. Considering the limited time for responding to the CfA, CEIOPS considers this a very successful outcome. In view of the result of the Sharma Report, the survey focused on the period between 2001 and 2004. CEIOPS also wished to include a survey on near misses; these were defined as companies which were still solvent but had problems which could have led to failures. As table 1 shows, between 2001 and 2004, 31 non-life insurers, 14 life insurers and 3 composite insurers suffered actual failure. The number of near misses was substantially higher than that of failures, with 56 for non-life, 39 for life and 57 for composite insurers. However, a large number of the composite insurers were either life or non-life insurers, but the Working Group did not have access to the relevant data.

Table 1: Number of failures and near misses between 2001 and 2004

<table>
<thead>
<tr>
<th>Actual failures</th>
<th>Near misses</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-life</td>
<td>Life</td>
</tr>
<tr>
<td>Total</td>
<td>31</td>
</tr>
<tr>
<td>Non-life</td>
<td>56</td>
</tr>
<tr>
<td>Life</td>
<td></td>
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<tr>
<td>Combi</td>
<td></td>
</tr>
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</table>
## Results from the actual failures questionnaire – 2005

<table>
<thead>
<tr>
<th>Risk group</th>
<th>Detailed risk</th>
<th>Number of instances</th>
<th>Non-life</th>
<th>Life</th>
<th>Combi</th>
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<tbody>
<tr>
<td><strong>Identification of problem</strong></td>
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<tr>
<td>Did the solvency ratio shortfall appear in the documents produced by the company?</td>
<td>22 10 1</td>
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<td>Did it appear only after intervention by the supervisory authority and adjustment notification?</td>
<td>7 4 1</td>
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<tr>
<td>Other circumstances</td>
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<tr>
<td><strong>Causes of problems</strong></td>
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<tr>
<td>Technical imbalance</td>
<td>Underpricing</td>
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<td>1</td>
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<tr>
<td></td>
<td>Mispricing</td>
<td>4</td>
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<tr>
<td></td>
<td>Excessive overheads</td>
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<td>1</td>
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<tr>
<td>Inadequate reinsurance</td>
<td>Insufficient protection</td>
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<tr>
<td></td>
<td>Disaster</td>
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<tr>
<td>Losses on assets</td>
<td>Default by reinsurers</td>
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<td>Bad debts on the part of insured parties and intermediaries</td>
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<tr>
<td></td>
<td>Losses on intra-group assets</td>
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<td></td>
<td>Investment depreciation</td>
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<td>9</td>
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<td></td>
<td>Other</td>
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<tr>
<td>Mismatched assets and liabilities</td>
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<tr>
<td>Management causes</td>
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<td>1</td>
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<tr>
<td>Other operational causes</td>
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<tr>
<td>Lack of liquidity</td>
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<tr>
<td>Other causes</td>
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<td>9</td>
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<td></td>
<td>1</td>
<td>1</td>
<td>2</td>
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<tr>
<td><strong>Preventive measures</strong></td>
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<tr>
<td>A) Request for a recovery plan to be set up</td>
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<td>B) Require an increase in capital</td>
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<tr>
<td>C) Prohibition of underwriting of new business</td>
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<td>D) Limitation of premium</td>
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<td>income</td>
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<td>E) Prohibition of certain investments</td>
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<td>F) Prohibition of free disposal of assets</td>
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<td>G) Custody of assets by the authority</td>
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<td>H) Reducing benefits of existing contracts</td>
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<td>I) Suspension of claims payments</td>
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<td>J) Mandatory portfolio transfer</td>
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<td>K) Measures relating to reinsurance ceded</td>
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<tr>
<td>L) Removal of members of the Board of Directors</td>
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<td>M) Removal of other managers</td>
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<tr>
<td>N) Appointment of a special commissioner</td>
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<tr>
<td>O) Actuarial investigation Auditor report / investigation</td>
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<tr>
<td>P) General meeting of shareholders called</td>
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<td>Q) Temporary suspension of authorisation</td>
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<td>R) Withdrawal of authorisation</td>
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<td>S) File for bankruptcy or winding-up</td>
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<tr>
<td>T) Initiate or recommend starting criminal proceedings, (including money-laundering)</td>
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<tr>
<td>U) Request to increase technical provisions</td>
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<tr>
<td>V) Other</td>
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</table>

**Current situation**

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</tr>
</thead>
<tbody>
<tr>
<td>Takeover by another company</td>
<td>2 2</td>
</tr>
<tr>
<td>Continuation of business as a (reduced) independent entity</td>
<td>18 10 2</td>
</tr>
<tr>
<td>Withdrawal of authorisation by the supervisory authority.</td>
<td>10 1</td>
</tr>
</tbody>
</table>

Table 2: Risk group: actual failures
Solvency ratio prior to the failure

<table>
<thead>
<tr>
<th>Reported solvency ratio up to 1 year before the actual failure</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td>-------------------</td>
</tr>
<tr>
<td>11</td>
</tr>
<tr>
<td>24%</td>
</tr>
</tbody>
</table>

Table 3: Solvency ratio up to 1 year prior to failure

<table>
<thead>
<tr>
<th>Reported solvency ratio up to 2 years before the actual failure</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td>-------------------</td>
</tr>
<tr>
<td>6</td>
</tr>
<tr>
<td>20%</td>
</tr>
</tbody>
</table>

Table 4: Solvency ratio up to 2 years before failure
### Results from the near misses questionnaire - 2005

<table>
<thead>
<tr>
<th>Risk group</th>
<th>Detailed risk</th>
<th>Number of instances</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Non-life</td>
</tr>
<tr>
<td>A)</td>
<td>Request for a recovery plan to be set up</td>
<td>7</td>
</tr>
<tr>
<td>B)</td>
<td>Demand an increase in capital</td>
<td>13</td>
</tr>
<tr>
<td>C)</td>
<td>Prohibition of underwriting of new business</td>
<td></td>
</tr>
<tr>
<td>D)</td>
<td>Limitation of premium income</td>
<td></td>
</tr>
<tr>
<td>E)</td>
<td>Prohibition of certain investments</td>
<td></td>
</tr>
<tr>
<td>F)</td>
<td>Prohibition of free disposal of assets</td>
<td></td>
</tr>
<tr>
<td>G)</td>
<td>Custody of assets by the authority</td>
<td></td>
</tr>
<tr>
<td>H)</td>
<td>Reducing benefits of existing contracts</td>
<td></td>
</tr>
<tr>
<td>I)</td>
<td>Suspension of claims payments</td>
<td></td>
</tr>
<tr>
<td>J)</td>
<td>Mandatory portfolio transfer</td>
<td>1</td>
</tr>
<tr>
<td>K)</td>
<td>Measures relating to reinsurance ceded</td>
<td>6</td>
</tr>
<tr>
<td>L)</td>
<td>Removal of members of the Board of Directors</td>
<td></td>
</tr>
<tr>
<td>M)</td>
<td>Removal of other managers</td>
<td></td>
</tr>
<tr>
<td>N)</td>
<td>Appointment of a special commissioner</td>
<td></td>
</tr>
<tr>
<td>O)</td>
<td>Actuarial investigation Auditor report / investigation</td>
<td>10</td>
</tr>
<tr>
<td>P)</td>
<td>General meeting of shareholders called</td>
<td></td>
</tr>
<tr>
<td>Q)</td>
<td>Temporary suspension of authorisation</td>
<td></td>
</tr>
<tr>
<td>R)</td>
<td>Withdrawal of authorisation</td>
<td></td>
</tr>
<tr>
<td>S)</td>
<td>File for bankruptcy or winding-up</td>
<td></td>
</tr>
<tr>
<td>T)</td>
<td>Initiate or recommend starting criminal proceedings, (including money-laundering)</td>
<td></td>
</tr>
<tr>
<td>U)</td>
<td>Request to increase technical provisions</td>
<td>8</td>
</tr>
<tr>
<td>V)</td>
<td>Other</td>
<td>18</td>
</tr>
</tbody>
</table>

**Table 5: Risk group: near misses, table one**
<table>
<thead>
<tr>
<th>Risk group</th>
<th>Detailed risk</th>
<th>Non-life</th>
<th>Life</th>
<th>Combi</th>
</tr>
</thead>
<tbody>
<tr>
<td>A)</td>
<td>Request for a recovery plan to be set up</td>
<td>3</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>B)</td>
<td>Demand an increase in capital</td>
<td>2</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>C)</td>
<td>Prohibition of underwriting of new business</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D)</td>
<td>Limitation of premium income</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E)</td>
<td>Prohibition of certain investments</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F)</td>
<td>Prohibition of free disposal of assets</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>G)</td>
<td>Custody of assets by the authority</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H)</td>
<td>Reducing benefits of existing contracts</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I)</td>
<td>Suspension of claims payments</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>J)</td>
<td>Mandatory portfolio transfer</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>K)</td>
<td>Measures relating to reinsurance ceded</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>L)</td>
<td>Removal of members of the Board of Directors</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>M)</td>
<td>Removal of other managers</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N)</td>
<td>Appointment of a special commissioner</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>O)</td>
<td>Actuarial investigation, Auditor report / investigation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P)</td>
<td>General meeting of shareholders called</td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Q)</td>
<td>Temporary suspension of authorisation</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>R)</td>
<td>Withdrawal of authorisation</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S)</td>
<td>File for bankruptcy or winding-up</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T)</td>
<td>Initiate or recommend starting criminal proceedings, (including money-laundering)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>U)</td>
<td>Request to increase technical provisions</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>V)</td>
<td>Other</td>
<td>4</td>
<td>3</td>
<td>3</td>
</tr>
</tbody>
</table>

Table 6: Risk group; near misses, table 2
## Results from the near-misses questionnaire - 2005

<table>
<thead>
<tr>
<th>Risk group</th>
<th>Detailed risk</th>
<th>Number of instances</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Non-life</td>
</tr>
<tr>
<td>A)</td>
<td>Request for a recovery plan to be set up</td>
<td></td>
</tr>
<tr>
<td>B)</td>
<td>Demand an increase in capital</td>
<td>1</td>
</tr>
<tr>
<td>C)</td>
<td>Prohibition of underwriting new business</td>
<td></td>
</tr>
<tr>
<td>D)</td>
<td>Limitation of premium income</td>
<td></td>
</tr>
<tr>
<td>E)</td>
<td>Prohibition of certain investments</td>
<td></td>
</tr>
<tr>
<td>F)</td>
<td>Prohibition of free disposal of assets</td>
<td></td>
</tr>
<tr>
<td>G)</td>
<td>Custody of assets by the authority</td>
<td></td>
</tr>
<tr>
<td>H)</td>
<td>Reducing benefits of existing contracts</td>
<td></td>
</tr>
<tr>
<td>I)</td>
<td>Suspension of claims payments</td>
<td></td>
</tr>
<tr>
<td>J)</td>
<td>Mandatory portfolio transfer</td>
<td></td>
</tr>
<tr>
<td>K)</td>
<td>Measures relating to reinsurance ceded</td>
<td></td>
</tr>
<tr>
<td>L)</td>
<td>Removal of members of the Board of Directors</td>
<td></td>
</tr>
<tr>
<td>M)</td>
<td>Removal of other managers</td>
<td></td>
</tr>
<tr>
<td>N)</td>
<td>Appointment of a special commissioner</td>
<td></td>
</tr>
<tr>
<td>O)</td>
<td>Actuarial investigation Auditor report / investigation</td>
<td></td>
</tr>
<tr>
<td>P)</td>
<td>General meeting of shareholders called</td>
<td></td>
</tr>
<tr>
<td>Q)</td>
<td>Temporary suspension of authorisation</td>
<td></td>
</tr>
<tr>
<td>R)</td>
<td>Withdrawal of authorisation</td>
<td></td>
</tr>
<tr>
<td>S)</td>
<td>File for bankruptcy or winding-up</td>
<td></td>
</tr>
<tr>
<td>T)</td>
<td>Initiate or recommend starting criminal proceedings, (including money-laundering)</td>
<td></td>
</tr>
<tr>
<td>U)</td>
<td>Request to increase technical provisions</td>
<td></td>
</tr>
<tr>
<td>V)</td>
<td>Other</td>
<td></td>
</tr>
</tbody>
</table>

Table 7: Risk group; near misses, table 3
Conclusion

In general, there was no main single cause of the actual failures, in contrast to the findings of the Sharma report for failures 1996-2001, where it was concluded that management represented the main cause. Referring to life insurance companies, the difficulty that was mentioned most often over recent years was the depreciation of investments due to the downturn on the capital markets that spanned the period of the survey.

The survey indicates that no single cause led to bankruptcy or other failures, but instead identified a number of different risk categories. In this context, it is obvious that only an enterprise-wide risk management policy that takes all the different risks into account represents appropriate coverage. Thus, the emphasis which CEIOPS is currently placing on an enterprise-wide approach within Solvency II is very important.

With regard to the concrete levels of the future solvency system, the survey identified that the 150% of current solvency ratio represents a critical level, and that breaching the 150% could serve as a solvency control level triggering intensified supervision, since most failures occur when entities breach the 150% of solvency ratio. With regard to the MCR, CEIOPS proposes that a percentage such as the 150% solvency ratio should trigger extraordinary supervisory intervention. It may also be necessary to take the relationship between MCR and SCR into account, since 150% of the MCR could already be above the SCR. The actuarial percentage would need to be assessed to take into consideration changes in the determination of asset values, liability values (including technical provisions) and the impact of these changes on the MCR.

With regard to the SCR, the survey does not provide any answers on new solvency control levels, since the existing solvency ratio is considered to be too different from the SCR (too risk-insensitive).
Possible approaches for modelling risk mitigation effects

D.1 How appropriate allowance for the risk mitigation effects of reinsurance may be made in the SCR standard formula still needs further analysis. For example, neither measures based on reinsurance premiums nor the ratio of net to gross technical provisions seems adequate in isolation.

D.2 As a first indication of one possible approach, examples are given in this annex setting out how premium and provision statistics for non-life business might be used to incorporate allowance for the effects of reinsurance in the SCR standard formula. However, it is recognised that a number of shortcomings still need to be overcome.

Reserve risk

D.3 According to its response to CfA 10 (see para. 10.82) CEIOPS recommends testing a personalised, factor-based approach to model reserve risk. Technical provisions would be the recommended volume measure and the factor should reflect the volatility of the run-off result.

D.4 Under this approach, the mitigation effect of reinsurance on reserve risk may be measured by the ratio of technical provisions net of reinsurance to the technical provisions gross of reinsurance at the beginning of the solvency assessment time horizon. This ratio might be considered as the retention ratio of reserve risk.

D.5 This approach might be developed for the case of proportional covers (in particular, quota-share covers) and, to a lesser extent, the case of non-proportional reinsurance.

D.6 If the reserve risk capital charge gross of reinsurance was measured by

\[ RC_{reserve, gross} = f \cdot TP_{gross} \]

then the reserve risk capital charge net of reinsurance could be measured by

\[ RC_{reserve, net} = f \cdot TP_{net} \]
where:

<table>
<thead>
<tr>
<th>TP(^\text{gross})</th>
<th>technical provisions gross of reinsurance</th>
</tr>
</thead>
<tbody>
<tr>
<td>TP(^\text{net})</td>
<td>technical provisions net of reinsurance</td>
</tr>
<tr>
<td>(f)</td>
<td>volatility factor</td>
</tr>
</tbody>
</table>

D.7 The factor \(f\) would be calibrated on the basis of gross data and on market level. In principle, for the determination of the risk capital charge net of reinsurance the factor \(f\) could be based on net data. However, since the volatility net of reinsurance depends in a complex manner on the reinsurance program of the insurer, this would require either to personalise the volatility factor in the factor-based approach or to make a market-wide assumption on the reinsurance program of any insurer. In the first case, the resulting model would not be feasible for a standardised approach. In the second case, the resulting model would superficially avoid the problem of recognising reinsurance, but would place further strain on Pillar II to deal with those undertakings for whom the industry-average credit for reinsurance would not be appropriate. By calibrating the factor \(f\) on the basis of gross data, CEIOPS might obtain a prudent estimate of the volatility net of reinsurance. However, for small (and some medium)-sized portfolios where gross volatility is high, this approach might result in insufficient allowance for the positive impact of reinsurance.

D.8 Where the entire business of an insurance undertaking is reinsured on a quota-share basis, this approach completely takes into account the risk mitigation of proportional reinsurance. It underestimates the risk mitigation of non-proportional reinsurance. Further consideration needs to be given to the validity of applying this type of approach by reference to subdivisions of an insurance undertaking’s business (e.g. line of business).

**Premium risk**

**Normal claims**

D.9 According to its response to CfA 10, CEIOPS recommends testing a personalised factor-based approach to model premium risk for normal claims. Premiums would be the recommended volume measure and the factor would reflect the expected value and the volatility of the combined ratio without run-off result. The premium risk capital charge can be disjointed into two summands referring to the following events:

- The premiums are lower than the expected value of claims and expenses, thus generating an expected loss; and
- The claims expenses turn out higher than their expected value due to the volatility of claims and expenses.
As far as the volatility of claims and expenses is concerned, the mitigation effect of reinsurance on premium risk may be measured by the ratio of premiums net of reinsurance to premiums gross of reinsurance. As far as the expected profit or loss is concerned, the expected value should be determined on a net basis.

If the premium risk capital charge gross of reinsurance was measured by

$$RC_{\text{premium, gross}} = f^{\text{vol}} \cdot P^{\text{gross}} \cdot f^{p/l, \text{gross}} \cdot P^{\text{gross}}$$

then the premium risk capital charge net of reinsurance could be measured by

$$RC_{\text{premium, net}} = f^{\text{vol}} \cdot P^{\text{net}} \cdot f^{p/l, \text{net}} \cdot P^{\text{net}}$$

where:

<table>
<thead>
<tr>
<th>$P^{\text{gross}}$</th>
<th>= premiums gross of reinsurance;</th>
</tr>
</thead>
<tbody>
<tr>
<td>$P^{\text{net}}$</td>
<td>= premiums net of reinsurance;</td>
</tr>
<tr>
<td>$f^{\text{vol}}$</td>
<td>= volatility factor;</td>
</tr>
<tr>
<td>$f^{p/l, \text{gross}}$</td>
<td>= profit/loss factor gross of reinsurance; and</td>
</tr>
<tr>
<td>$f^{p/l, \text{net}}$</td>
<td>= profit/loss factor net of reinsurance.</td>
</tr>
</tbody>
</table>

The factor $f^{\text{vol}}$ reflects the volatility of the combined ratio and should be calibrated on basis of gross data and on the market level. The factors $f^{p/l, \text{gross}}$ and $f^{p/l, \text{net}}$ reflect the expected profit or loss of the business gross and net of reinsurance.

Where the entire business of an insurance undertaking is reinsured on a quota-share basis, this approach completely takes into account the insurance risk mitigation of proportional reinsurance, but does not adequately deal with risk such as credit risk. It underestimates the risk mitigation of non-proportional reinsurance. In general, it would not reward reinsurance which does not transfer risk, since such reinsurance would lower the net premiums and the profit factor alike. Further consideration needs to be given to the validity of applying this type of approach by reference to subdivisions of an insurance undertaking’s business (e.g. line of business).

**Catastrophic claims**

The answer to CfA 10 suggests that the proposed factor-based approach to premium risk should be supplemented with simple scenario techniques to take account of the impact of low-frequency, high severity events. To calculate the risk capital charge for this part of
premium risk, the insurer has to estimate the impact of specified claim scenarios in view of the particularities of its business.

D.14 The mitigation effects of reinsurance may be taken into account by estimating the impact of the scenarios allowing for the reinsurance program and other risk mitigation techniques which risk characteristics are comparable to reinsurance.

D.15 This approach takes into account reinsurance and comparable risk mitigation techniques in the case of specific scenarios. These scenarios might not cover all possible catastrophes. Further discussion is needed to exclude the possibility, that the insurer is misled to adjust its reinsurance program to the specified scenarios and to neglect the mitigation of risks which are not covered by the scenarios. Further consideration might be given to the validity of applying this type of approach by reference to subdivisions of an insurance undertaking’s business (e.g. line of business).
Non-linearity, tail behaviour and correlation effects

E.1 A large variety of reinsurance covers and combinations of such covers are available. However, the impact of the combinations of reinsurance covers on individual claim amounts as well as total claim amounts – within a specific line of business or for the insurance company’s overall portfolio – may vary substantially, depending on the characteristics of the actual reinsurance cover or combination of such covers.

E.2 The present part comments briefly on some of the more technical aspects related to the various types of reinsurance covers and their impact on both individual and total claim amounts, i.e. non-linearity of reinsurance covers, tail behaviour and the efficiency of reinsurance covers and correlation effects. As will be seen from the discussion below, these aspects are – at least to some extent – interlinked.

E.3 In general terms it may be stated that all the abovementioned technical aspects may have an impact on the ability of a reinsurance cover – or combination of covers – to reduce the volatility and uncertainty of insurance operations and especially the consequences of extreme events. Accordingly, these aspects should be taken into consideration when stipulating the solvency capital requirement (SCR). Some general comments on how this might potentially be done in practice – especially in the context of the standard model for the SCR – are given in the last section.157

Non-linearity of reinsurance covers

E.4 It should be noticed that the concept 'non-linearity' is applied in several different contexts when it comes to the modelling of relevant risk processes (in a wide sense) for stipulating requirements for technical provisions and solvency capital in insurance. However, in this section it is focussed only on a few aspects that may be of importance when considering to what extent the impact of reinsurance covers should be taken into account when designing the standard formula for the SCR.

E.5 As a first example of the non-linear aspects concerning the impact of reinsurance covers on the claim amounts, one may refer to the distinction between proportional reinsurance (typically quota share and surplus covers) and non-proportional (typically excess-of-loss and stop-loss covers). In the IAA Solvency Report the issue at stake has been briefly described as follows:

157 With respect to internal models, it seems reasonable to include an adequate treatment of non-linearity, tail behaviour and correlation effects among the minimum design criteria for such models. With respect to the stipulation of technical provisions – and especially the risk margin – the relevant issues regarding the impact on reinsurance covers are discussed in the context of CfA 7 and CfA 8.
“While proportional reinsurance typically reduces the overall (nominal) risk in a linear way, non-proportional covers typically address the large losses, thereby reducing the company’s net exposure to large loss/catastrophic events. Technically speaking, non-proportional reinsurance eliminates part or all of the volatility coming from the tail of the distribution.”

E.6 By taking a simple quota share cover as an example, the single claim amount net of reinsurance \((Y_{\text{Net}})\) may be expressed as a linear function of the claim amount gross of reinsurance \((Y_{\text{Gross}})\), that is

\[
Y_{\text{Net}} = Q \times Y_{\text{Gross}}
\]

where \(Q\) represents the (cedant’s) retention ratio for the quota share cover in question.

E.7 If the quota share cover is the only reinsurance cover applied for the line of business (LOB) in question, a similar relation holds for the total claim amounts related to that LOB (for a given financial year) – at least as long as all claim amounts on a gross basis are less than the limit of the quota share cover. However, in general this simple linear relation will not hold for the total claim amounts related to the company’s overall business – unless the reinsurance arrangements in all LOBs consist of similar quota share covers.\(^{158}\)

E.8 For all other reinsurance covers – whether proportional or non-proportional or combinations of them – there is in general a non-linear relationship between the claim amounts on a net basis and the claim amounts on a gross basis. This fact concerns both the single claim amounts and the total claim amounts (either within a LOB or for the overall portfolio of the company in question).

E.9 Examples of more complex reinsurance covers that would support the relevance of the aspect of non-linearity sketched above may be the combination of quota share and excess-of-loss covers or the combination of surplus and excess-of-loss covers. In both cases the presence of aggregate deductibles and aggregate limits as well as calls for reinstatement premiums adds to the complexity. As a further example one may refer to ‘umbrella arrangements’ covering several LOBs.\(^{159}\)

E.10 It may be argued that the non-linear effects should have an impact on the design of the standard formula for the SCR. This is especially the case if the non-linearity (the non-linear reduction of the nominal risk) has an effect on the volatility as indicated in the IAA report.

\(^{158}\) Even in this simple case where the reinsurance arrangement in all LOB consists of quota share covers with retention ratios that are specific for the individual LOB, the simple linear relationship between the total claim amounts on a net basis and gross basis, respectively, may break down. In fact the overall (or average) retention ratio will depend on the distribution of the total claim amounts between the individual LOBs.

\(^{159}\) Cf. the IAA Solvency Report (2004), page 71, where it is referred to complexities stemming from “the tremendous diversity in the types of insurance contracts”.
Another aspect of the non-linearity issues concerns “the fact that many reinsurance contracts do not bear a linear relationship with the underlying risks. [...] In fact, the contracts transforming the overall risk into a 'narrower' risk profile typically are exactly of this nature. The magnitude of the leverage effect depends on the sizes of the retention (attachment point or priority) and the limit.”

A simple example of this aspect of non-linearity may be an excess-of-loss cover with retention (attachment point) \( M \) and limit \( L \). In this case the single claim amount net of reinsurance \( Y_{Net} \) is given by:

\[
Y_{Net} = \min(Y_{Gross}, M) + \max(0, Y_{Gross} - L).
\]

In a context of non-negligible claims inflation the risk sharing effect of this reinsurance cover may vary considerably depending on the delay between the occurrence and final settlement of the individual claims – unless the retention \( M \) and the limit \( L \) are adjusted according to an index reflecting the claims inflation.

Similar effects may apply for other types of reinsurance cover (including stop-loss covers) where aggregate deductibles and aggregate limits are stipulated in nominal terms.

A considerably more technical aspect of the concept 'non-linearity' concerns e.g. the non-linear correlation effects between the individual LOBs. However, this aspect is briefly commented upon in conjunction with the discussion below regarding correlation effects.

It seems reasonable that the various aspects regarding non-linearity referred to above should impact on the standard model for stipulating the SCR. Some initial considerations on this issue is given in the last section of this annex.

**Tail behaviour and the efficiency of reinsurance covers**

As with the concept 'non-linearity', the concept 'tail behaviour' is applied in different contexts regarding the (statistical) modelling of insurance risk processes and again it will be referred only to some aspects that may be relevant for analysing the impact of various reinsurance arrangements on the stipulation of the SCR (or more precisely on the stipulation of the risk capital charge related to underwriting risk).

The analysis of 'tail behaviour' will be of special interest in cases of (heavily) skewed probability distributions or probability distributions with heavy ('fat') tails – both for the individual and the total claim amounts.

It the present context it seems likely that standard measures of tail behaviour as e.g. the failure rate (the hazard rate)\(^{160}\) would not

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\(^{160}\) For a definition of the failure rate or hazard rate (as a standard measure of the tail behaviour of a distribution function) it may be referred to Cf. Klugman et. al. (1998): “Loss Models” (Wiley), pages 86ff.
contribute with any additional information relevant for evaluating the impact of (combinations of) reinsurance covers on the SCR calculated according to the standard model – taking into consideration the information on tail behaviour that is already reflected by applying the TailVar approach as a risk measure for the underwriting risk (possibly estimated for alternative choices of the confidence level).

E.20 A more adequate starting point for the discussion of tail behaviour in the context of reinsurance could (again) be the distinction between proportional and non-proportional reinsurance covers:

- A quota share cover is designed such that the reinsurer assumes a fixed percentage of each and every loss. This means that the expected loss as well as every percentile of the claim size distribution is reduced by a given percentage. In terms of risk mitigation the risk profile is only 'compressed' and the impact on the 'fatness' of the tail of the claim size distribution is likely to be limited.

- On the other hand an excess-of-loss cover (or a stop-loss cover) truncates the claim size distribution function (or the distribution function of the total claim amount) at the retention and may accordingly have a major impact on the tail behaviour of the actual distribution functions for both single claim amounts and the total claim amounts net of reinsurance. It should however be noticed that this case will be somewhat more complex if there is an upper limit to these covers.

E.21 It seems reasonable to believe that the impact on the tail behaviour of combinations of proportional and non-proportional reinsurance covers will be somewhere between these two extremes (assuming that these reinsurance covers are 'complete' i.e. without any deficiencies that may have a negative impact on the net underwriting result).

E.22 A slightly different approach regarding the evaluation of the tail behaviour of distribution functions of total claim amounts would be to distinguish between

- LOBs characterised by high frequency and low/moderate severity of claims; and

- LOBs characterised by low frequency and high/extreme severity of claims.

E.23 A reinsurance arrangement that by and large consists of (unlimited) non-proportional covers would in general have a considerably larger impact on the tail behaviour of the distribution function – and consequently on the volatility of the underwriting result – in the second case than in the first case. Moreover, a reinsurance arrangement that by and large consists of proportional reinsurance covers would not be suitable in the second case as it would not have any substantial impact.
on the 'fatness' of the tail of the distribution function for the total claim amounts.

E.24 With respect to both approaches sketched above it should be noticed that the analysis of the impact of a given reinsurance arrangement (consisting of both proportional and non-proportional covers) on the tail behaviour of the distribution function of the total claim amount – and accordingly on the volatility of the underwriting result – is a complex issue. In order to find an answer to the question on how such complex reinsurance arrangements should impact on the capital charge related to the underwriting risk, it seems necessary to turn to approximate methods and simulation techniques.

E.25 However, it should in any case be stressed that non-proportional reinsurance covers are in general more 'efficient' than proportional reinsurance covers with respect to reducing the 'fatness' of the tail of the distribution function (of both individual and total claim amounts) and accordingly the volatility of the underwriting result. In the IAA Solvency Report this aspect is briefly summarised as follows:

"[r]einsurance, in particular the non-proportional type, can greatly reduce, or even eliminate, the extreme tail of the cedant's loss distribution. This effect can be assessed mathematically if the TVar risk measure is being used. [...] If applied properly in a solvency or management context, reinsurance is a very efficient means of reducing risk (particularly if measured by TVar) and therefore risk-bearing capital."

E.26 This aspect should be taken into account when stipulating the part of the SCR representing the capital charge for underwriting risk, cf. also the last section of the present part.

Correlation effects

E.27 The main purpose of this section is to discuss the possible impact of various reinsurance covers on the tail correlation or tail dependence between two or several lines of business (LOBs).

E.28 In general terms it may be stated that 'tail correlation' or 'tail dependence' occurs if two or more LOBs apparently operate independently in 'normal times' but deteriorate together if the 'insurance environment' (in some sense) deteriorates. A more precise explanation may be to describe tail dependence as "the phenomenon whereby certain loss distributions show dependence only in the extreme tail." In the presence of this phenomenon it should be noticed that standard correlation analysis will not be able to capture "the fact that certain areas of the loss distributions may be highly correlated while others are less correlated or independent."

Another way to express this phenomenon may be to consider the claim distributions – at least for some LOBs – as consisting of two possibly distinctive parts\textsuperscript{162}

- the part of the distribution dealing with 'normal' claims; and
- the part of the distribution dealing with extreme claims.

Some examples of mechanisms that may give rise to correlations between different LOBs may be as follows\textsuperscript{163}

- events that generate losses for many insurance policies related to several LOBs;
- cycles of market prices (premium rates) of insurance reflecting e.g. the competitive environment in several LOBs; and
- macroeconomic trends as e.g. changes in inflation that impact on the single claim amounts (in several or all LOBs).

More specific examples may be “the correlation of various types of claims with economic influence” and “extreme tail correlation of insurance and credit risk caused by major catastrophes leading to reinsurance failure.”

The question arises how to assess the impact of the various reinsurance covers in this context. To what extent will the various reinsurance covers contribute to a reduction of the tail correlation (or tail dependence)?

As a first general comment, it seems likely that non-proportional reinsurance (e.g. excess-of-loss covers) has the potential of mitigating the negative impact of tail correlation when the conditions of the insurance markets develop in an adverse manner, e.g. due to the occurrence of (catastrophic) events generating extreme aggregate claim payments. However, it should also be noticed that these aggregate claim payments may contribute to exhaust the capacity of the reinsurance markets or trigger a sharp increase in the premium rates for the relevant reinsurance covers.

On the other hand, it seems equally likely that proportional reinsurance (e.g. quota share covers or surplus covers) will have no material impact on the tail correlations of the kind sketched above – with a possible exception for some facultative reinsurance covers.

It should however be stressed that in order to give a qualified assessment of the impact of various reinsurance arrangements on the tail correlations it will be necessary to carry out in depth studies of individual cases – starting with a detailed mapping of the mechanisms that may lead to these correlations or dependencies.


A closely related question is to what extent the impact of reinsurance on the tail correlations (if any) should be reflected in the standard model for stipulating the part of SCR representing the capital charge for underwriting risk (net of reinsurance). Generally speaking this will depend on the manner in which the capital charge for underwriting risk is calculated. Some of the important aspects to be considered in this context are the following:

- whether the basis of calculation for this capital charge should be stipulated gross or net of reinsurance;
- whether the capital charge for underwriting risk should be calculated for the overall business or for the individual LOBs (or some groups of 'similar' LOBs).

Again, it should be stressed that in order to get a clearer picture of the issue at stake further analysis and case studies are required. In this connection special attention should be given to the question of how to measure the impact of reinsurance on tail correlations in a reliable manner. Especially these analyses should comprise an evaluation of whether the TailVar-approaches (including any approximations) discussed in the context of CfA 10 have captured the adverse impact of tail correlations. If this is not the case, it should be considered whether other sophisticated techniques (e.g. copulas and simulation techniques) should be applied in order to get a qualified view of this shortcoming of the standard formula. A specific challenge for the further analysis and case studies is related to the fact that the reinsurance arrangements may vary substantially – both between the individual LOBs (within a given insurance company) and between insurance companies.

If the part of the SCR representing the capital charge for underwriting risk – on either a gross basis or a net basis – has been stipulated by applying some approximations to the risk measure chosen at the outset (which is likely to be TailVar), a supplementary analysis may be necessary in order to clarify whether there should be given any credit for the impact of reinsurance covers on the tail correlations. In conducting this analysis it is essential to take into consideration how well the approximated standard model has captured the adverse effect of tail correlation.

Some additional remarks regarding the impact on the SCR

Even if the concepts non-linearity, tail behaviour and correlation effects (and especially the tail correlation) refer to slightly different aspects of the impact of reinsurance on (especially) the underwriting risk, they are interlinked. Accordingly, it may be difficult to distinguish between these aspects when stipulating the impact of reinsurance arrangements within the context of the standard model for the part of the SCR representing the capital charge for underwriting risk.

An adequate approach regarding the standard model may be to allow the insurance companies applying the standard model to develop partial internal models for stipulating the impact of their reinsurance...
programmes on the capital charge (net of reinsurance). Within the context of factor-based standard models this approach may in fact be viewed as a manner of introducing personalised factors.

E.41 In any case, further analyses and impact studies are necessary before a final decision can be taken with respect to how (much) reinsurance should impact on the SCR (and especially the capital charge for underwriting risk).

E.42 In this connection it may be referred to the IAA Solvency Report where the comments regarding the impact of reinsurance on the risk profile and accordingly the SCR are summarised as follows:

“The recognition of reinsurance for solvency purposes must be closely linked to the ability of the company, the supervisor or both to assess the impact of the reinsurance program on the risk profile. Given the diversity and complexity of reinsurance contracts, it is apparent that a simple factor-based approach is likely to be too crude to reflect the effect of reinsurance on capital requirements accurately.

The possibility to adequately reflect the risk reducing impact of reinsurance crucially depends on the ability to reliably come up with a risk profile of the portfolio to be reinsured. The less information is available and the cruder the model is, the less adequately the impact of reinsurance can be assessed and, consequently, the less credit should be given.”

E.43 With respect to internal models an adequate treatment of non-linearity, tail behaviour and correlation effects should in any case be included as an integral part of the design criteria for such models.