



CEIOPS-FS-07/06

## Quantitative Impact Study 2

### Additional Information Requests

#### Section 1 - Qualitative Questionnaire

##### *General*

1. Please provide some assessment of the reliability and accuracy of your results, and of the input data for the SCR and the MCR.
2. Which were the major practical difficulties encountered? Do you have any suggestions about how to solve these problems?
3. Can you provide an estimate of the additional resources (in person months) that are likely to be required
  - (a) to develop appropriate systems and controls, and
  - (b) to carry out a valuation each year of the provisions, the MCR, and the SCR in accordance with the methodology proposed here?

For this purpose, please distinguish if possible between the resource requirements for the placeholder version of the SCR and the alternative approach for the SCR.

What level of resource (in person months) was required to complete QIS2?

4. Please set out any views you may have about the suitability and appropriateness of the methodology set out in this specification, about the incentives for effective risk management, and about any

simplifications that might sensibly be introduced to increase the practicability of the calculations, for

- (a) the assessment of provisions,
- (b) the valuation of assets,
- (c) the calculation of the MCR,
- (d) the calculation of the placeholder formula for each component of the SCR, and
- (e) the calculation of the alternative approach for each component of the SCR.

***Valuation assumptions: standard approach***

- 5. For which risk factors did you apply a risk margin approach for the assessment of the 75<sup>th</sup> percentile in the calculation of the provisions? Which risks did you consider to be hedgeable?
- 6. Please explain the methodology applied to derive the 75<sup>th</sup> percentile, and how the main actuarial and statistical methods and assumptions have been chosen. Please also state the assumed level of volatility underlying the 75<sup>th</sup> percentile calculation for the relevant risk factors, and whether this is based on the firms' own experience or general market data. (For those undertakings that participated in QIS1, there is no need to repeat information already provided for QIS1, but please indicate if any change in the methodology for assessing provisions has been applied for QIS2.)
- 7. Please describe your approach for the valuation of hedgeable financial options and guarantees on life policies. How did you assess the appropriate take-up rates to assume where there is more than one possible date on which a policyholder can elect (by surrendering the policy or otherwise) to take some guaranteed cash value (or annuity)? How did you allow for potential variability in the take-up of options (including the option to surrender a policy) in different investment conditions?
- 8. Please explain the methods and assumptions applied for the assessment and valuation of future bonuses on life insurance policies (including the role of any bonus reserves/provisions, if significant).
- 9. Did you apply the option in paragraph 2.28 of the specification, such that where discretionary future bonuses may be used to cover 'general' losses, the 'placeholder' valuation of technical provisions may be restricted to guaranteed benefits? [*Yes (some policies) / Yes (all policies) / No*]. How did you assess the appropriate value of K (para. 5.14)?

***Valuation assumptions: cost of capital approach***

10. Please comment on the appropriateness of using the fixed assumptions from the Swiss Solvency Test for the cost-of-capital approach. In case you provided additional estimates using your own assumptions in addition to the assumptions from the Swiss Solvency Test, your own assumptions should be contrasted with the assumptions underlying the Swiss Solvency Test.

***Eligible elements to cover the capital requirements***

11. Please provide qualitative and quantitative information regarding the extent to which the estimate of available capital suggested in the specification differs from your own assessment of available capital and the reasons for such differences.

***SCR standard formula***

**Methodology and calibration**

12. On a scale of 1 to 5 (1 poor and 5 good), please rate the methodological suitability and the preliminary/illustrative calibration (against the criteria set out in paragraphs 6.6 and 6.8 of the specification), together with the practicability, of the proposed methodology for the calculation of the SCR component for each risk module.

	Market risk	Credit risk	Life u/w risk	Health u/w risk	Non-life u/w risk	Operational risk
<b><i>Suitability</i></b>						
Placeholder						
Alternative						
<b><i>Calibration</i></b>						
Placeholder						
Alternative						
<b><i>Practicability</i></b>						
Placeholder						
Alternative						

13. Please set out any views you may have on how the parameters for the SCR should be chosen. (Please note that the parameters selected for the QIS2 specification are only initial and very tentative, and should not be regarded as indicative of the likely recommendations by CEIOPS for the Solvency II SCR, see para. 5.4 of the technical specification)

### **Diversification effects**

14. Could you please describe how you determined the relevant correlation between risk factors to be taken into account when assessing the diversification benefits for (a) provisions, and (b) the SCR. In particular, how did you allow for the possibility that correlations between risk factors would be higher when considering the tails of the distributions? Please also provide any comments you may have on the suitability of the other correlation factors that are set out within Chapter 5 of the QIS2 specification.

### **SCR<sub>health</sub> health underwriting risk module**

15. Participants are invited to provide the following information:
- Does the proposed approach adequately reflect the health risk of your portfolio? If not, how could it be improved?
  - Could a more reliable estimate be made of the expected result in health expense risk (respectively, in health excessive loss/mortality/cancellation risk)? How might this estimate be verified?

### **NL<sub>prem</sub> premium risk**

16. On the treatment of premium risk, participants are invited to comment on the following points:
- Does the undertaking-specific estimate of the expected value and the standard deviation of the combined ratio adequately capture the premium risk of your portfolio? In the context of the standard formula, how could the company-specific assessment of premium risk be improved?
  - Could a more reliable estimate be made of the expected surplus or deficit arising from the next year's premium? How might this estimate be verified?
  - Does the proposed approach adequately reflect the risk mitigation provided by your reinsurance programme? If not, how could it be improved?
  - Do the proposed volatility factors (based on market-wide gross data) represent an adequate estimate of the net volatility of your portfolio-specific premium risk? If not, which parts of your reinsurance programme contribute to this bias? Are there other reasons why consider the volatility factors may be inappropriate?

- Do you consider the correlations between lines of business to be appropriate? Please provide reasons and, if possible, alternatives.
- In which way could additional information on reinsurance programmes be used in a standardised treatment of the effects of risk mitigation to premium risk?

**NL<sub>res</sub> reserve risk**

17. On the treatment of reserve risk, participants are invited to comment on the following points:

- Does the undertaking-specific estimate of the expected run-off result in the forthcoming year (on the basis of a valuation according to a 75%-quantile) seem appropriate?
- Does the proposed approach adequately reflect the risk mitigation of your reinsurance programme? If not, how could it be improved?
- Does the proposed volatility factor (based on market-wide gross data) represent an adequate estimate of the net volatility of your portfolio-specific reserve risk? If not, which parts of your reinsurance programme contribute to this bias?
- In which way could additional information on reinsurance programmes be used in a standardised treatment of the effects of risk mitigation to reserve risk?

18. In case the mitigating impact of any pool arrangements have been taken into account, participants are requested to supply the following information regarding the pool arrangements:

- the "legal form" of the pool arrangement (i.e., whether it is a compulsory arrangement, whether, subsequent to the event covered occurring, an increase in contributions to the pool would be unavoidable and required, whether the State acts as "a (re)insurer of last resort" etc)
- the kind of catastrophic events and corresponding claims covered by the pool arrangement
- the capacity of the pool arrangement, including information on how the funds (assets) related to the pool arrangement are cumulated and managed
- whether the pool arrangement relies on any reinsurance covers

- information on for how long the pool arrangement has been in place as well as any data on how well the pool arrangement has behaved in previous “stressed situations”, e.g. during severe storms and floods.

It is not necessary for every participant in the pool to provide this information. The information may be provided by one participant (or a third party) on behalf of all participants. In that case the other participants need merely confirm their membership of the pool, adding such supplementary information as they consider appropriate.

### **NLCat CAT risk**

19. Participants are requested to identify their five largest exposures due to Nat-CAT events. The undertaking should assess the total losses arising from each of these catastrophes, taking into account accumulation of claims from different insurance policies and lines of business (as well as mitigating effects from its reinsurance cover and any pool arrangements), and compare this with the impact of the severe Nat-CAT event specified by the regulator.

### **SCR<sub>op</sub> operational risk module**

20. Participants are invited to provide yes/no responses to the following questions:
  - Do you have a formal process for regular assessment and management of operational risk exposures?
  - Do you have processes to identify operational risks under a range of risk-groupings (e.g. environmental risks, business model-related risks, customer and product control-related risks, corporate control-related risks)?
  - Do you adopt a 'cause and effect' approach by determining the probability and estimated loss for all potential sources of operational risk?
  - Do you consider 'expected' operational risk losses as part of your business planning, with separate treatment for 'unexpected' / 'extreme' operational risk losses?
  - Have you carried out any statistical analysis of operational risk exposures?
  - Have you carried out any scenario-based analysis of operational risk exposures?

## ***SCR Internal models***

21. If you have applied an internal model for any of the above elements of the SCR, then please describe the methodology underlying the model, and also how the model was calibrated and validated. In particular, participants are encouraged to comment on reasons for material differences between their internal model estimates and the results of the standard formula modelling treatments, especially where they suspect the latter fail to reflect the true drivers of risk.
22. In its answer to Call for Advice No. 10, CEIOPS expressed the general purpose of the SCR 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 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 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 apply when an internal model is used to calculate the SCR. Participants are invited to comment briefly on the extent to which these objectives are consistent with those currently underpinning their own internal model.

23. The answer to CfA 10 articulates a set of design criteria for the SCR that apply to both the standard formula and internal models. In broad terms, these are:
  - the unacceptable level of capital (definition of ruin) being where assets no longer exceed technical provisions (including any risk margin) and other liabilities
  - a target probability of survival of 99.5%
  - a time horizon of one year
  - TailVaR as the risk measure (or, in some circumstances, VaR calibrated to deliver approximately the same degree of prudence as TailVaR)
  - assets and liabilities (including technical provisions) valued in accordance with section 2 of this specification

Participants are invited to indicate whether their internal model is consistent with each of these criteria, or, alternatively, to describe the equivalent currently used.

### ***Minimum Capital Requirement***

24. Could you please explain if there are any aspects of the calculation of the MCR, or the related data requirements, that would be difficult to fulfil in cases where interim MCR calculations were required by the supervisor (e.g. end quarter, end month)?

### ***Group issues***

25. In case you report on behalf of a group, please list the single entities which were included in the QIS2. If figures for individual entities within a group have been combined, then please describe how this is done, including how the figures for the provisions and for the aggregate SCR have been assessed.
26. At a more general level, we would welcome information on the following points:
- (a) What are the sources and nature of diversification benefits or contagion effects within a group?
  - (b) What is the total diversification benefit obtained by the implementation of your model within your group with respect to group economic capital?
  - (c) From a practical perspective, how do your internal models reflect diversification benefits at the group level? In particular, how does your internal model deal with the aggregation of life and non-life risks?
  - (d) What is the contribution of each source or 'level' of diversification to the total diversification benefit? N.B. 'Levels' depend on the way in which the internal model calculates the risks throughout the group (e.g. diversification within and between risk factors; within and between lines of business etc.)



## Section 2 – Additional data requests

### SCR<sub>mkt</sub> market risk module

27. Please calculate the effect of a 'combined scenario' where the equity and interest rate shocks described in  $Mkt_{eq}$  and  $Mkt_{int}$  occur simultaneously.

*Please enter this data in Sheet II.4*

### Mkt<sub>int</sub> interest rate risk

28. Please subdivide your bond portfolio into the following groups:
- Bonds corresponding to non-life technical provisions
  - Bonds backing life insurance contracts with no participating profit clauses for policyholders
  - Bonds corresponding to participating (with profits) life contracts
  - Bonds allocated to policies where the policyholder bears the investment risk
  - Bonds allocated to the insurer's own funds

For each group, the duration of the bonds and the interest rate volatility in that group (weighted by market value) should be provided.

*Please enter this data in Sheet II.4*

### Mkt<sub>eq</sub> equity risk

29. Please subdivide your equity portfolio into the following groups:
- Equities corresponding to non-life technical provisions
  - Equities backing life insurance contracts with no participating profit clauses for policyholders
  - Equities corresponding to participating (with-profits) life contracts
  - Equities allocated to policies where the policyholder bears the investment risk
  - Equities allocated to the insurer's own funds

For each group, the average volatility of equities in that group weighted by market value should be provided

*Please enter this data in Sheet II.4*

**SCR<sub>cred</sub> credit risk module**

30. To enable CEIOPS to identify the most material sources of credit risk, participants are requested to provide additional information on the total cash delta (MVi • Duri) for their non-reinsurance credit risk exposures. This should be subdivided as follows:

		Duration bucket					
		< 1yr	1-5yr	5-10yr	10-15yr	15-20yr	> 20yr
Ratings bucket	I						
	II						
	III						
	IV						
	V						
	VI						
	VII						
	VIII						

**Example:**  
Sum of the cash deltas for all non-reinsurance exposures of duration between 1 & 5 years and credit quality in rating bucket IV

A separate matrix should be provided for reinsurance exposures, using the same ratings and duration buckets.

*Please enter this data in Sheet II.5*

31. To assess the effects of concentrations of credit risk, participants are also requested to provide a matrix providing aggregate information on their top five non-reinsurance credit risk exposures for each combination of ratings and duration bucket. Again, the cells of the matrix should contain the total cash deltas.

		Duration bucket					
		< 1yr	1-5yr	5-10yr	10-15yr	15-20yr	> 20yr
Ratings bucket	I						
	II						
	III						
	IV						

**Example:**  
Sum of the cash deltas for five largest non-reinsurance exposures of duration between 15 & 20 years and credit quality in rating bucket II

	V						
	VI						
	VII						
	VIII						

Participants are also requested to disclose in respect of their largest reinsurance exposure, after allowing for any collateral (including exposures to other companies in the same group as the undertaking concerned):

- its size, expressed as a proportion of total reinsurance exposures (net of collateral)
- the relevant rating bucket
- its duration (Duri)

***Please enter this data in Sheet 11.5***

32. In respect of total exposures to reinsurers that are covered by collateral, the following amounts should be disclosed:

- total value of posted collateral held on the participant's balance sheet; and
- total value of collateral carried off balance sheet.

***Please enter this data in Sheet 11.5***

**SCR<sub>life</sub> life underwriting risk module**

33. Participants are requested to calculate the effect of the following combined scenarios:

- the shocks defined in  $Life_{mort}$ ,  $Life_{morb}$  and  $Life_{dis}$  occurring simultaneously;
- the shocks defined in  $Life_{lapse}$  and  $Life_{exp}$  occurring simultaneously; and
- the shocks defined in  $Life_{mort}$ ,  $Life_{morb}$ ,  $Life_{dis}$ ,  $Life_{lapse}$  and  $Life_{exp}$  occurring simultaneously.

***Please enter this data in Sheet 11.6***

### **SCR<sub>nl</sub> non-life underwriting risk module**

34. Undertakings are requested to provide information to test the feasibility of a more scientific allowance for the effect of the size of its portfolio on the overall non-life underwriting risk. This information will not be used in the SCR calculation at this stage but is intended to be used to investigate whether a more scientific approach than that described above is possible. The following definitions should be used for this purpose:

- For each line of business, firms are asked to select a “policy measure”, such as sum assured or probable maximum loss, so that the claim size distribution for a claim on an insurance policy is roughly proportional to the policy measure. Preferably the policy measure will be used in managing the business. Where an insurance policy covers two or more distinct risks (e.g. a property insurance covering more than one site) the distinct parts should be treated as separate policies with different policy measures, where practical. Likewise where several policies cover the same risk it is desirable to treat them as a single policy. The policy measure should be proportionately reduced where there is proportional reinsurance.
- The lines of business for this purpose may be the lines used in the placeholder formula or they may be sub-lines.
- Claim amounts should allow for future inflation etc in full and be discounted back to the date of the QIS at the risk free rate. They should be net of proportional reinsurance and of individual excess of loss reinsurances. Whole account stop loss and catastrophe reinsurance should not be netted off claims.

Specifically, undertakings are requested to provide, for each line of business:

- Total expected claims, separately for: unexpired risks (the claims that will occur in future on existing contracts); IBNR; and known outstanding claims.
- A reasonable approximation to the sum over all insurance policies of the product of the expected claims (EC) and the policy measure (PM) (that is  $\sum(EC \times PM)$ ). This is requested separately for unexpired risks and IBNR. For unexpired risks, a reasonable approximation might be the sum over all insurance policies of the product of the unearned premiums (UP) and the policy measure, multiplied by the ratio of total expected claims to unearned premiums (that is  $\sum(UP \times PM) \times \sum(EC) / \sum(U) \cong \sum(EC \times PM)$ ). For IBNR, a reasonable approximation might be the sum over all insurance policies of the product of the earned premiums the previous year (EP) and the policy

measure, multiplied by the ratio of IBNR to earned premiums (that is  $\sum(EP \times PM) \times IBNR / \sum(EP)$ ).

- For known outstanding claims, estimates of the sum of case estimates of amounts still outstanding and the sum of case estimates squared (ie  $\sum C$  &  $\sum C^2$ ). Where the firm does not make case estimates for all outstanding claims, it should make estimates for a sample of claims (preferably a stratified sample containing a higher proportion of those claims that are likely to be settled for large amounts), and estimate the required sums from these samples.
- The ratio (updated to the date of the QIS for inflation, trends etc) of total amount of claims notified over the previous year divided by the total of the policy measures for those insurance policies that became claims ( $\sum C / \sum(PM)$ ); or some other reasonable estimate of the weighted average of the ratio of claim to policy measure (weighted by policy measure).
- A reasonable estimate of the weighted average of the ratio of the square of the claim to the square of the policy measure (weighted by policy measure squared): eg  $\sum C^2 / \sum(PM)^2$ , where the summation is only for policies that become claims. Where it is possible to estimate higher moments that would be welcome.
- ***A description of the policy measure and of the methodology to derive it and the data provided, together with other relevant information (such as the maximum net claim, where there is non-proportional reinsurance).***

***Please enter the above data in Sheet IV.6 etc, and provide in the questionnaire the relevant information (in the final paragraph in italics above)***

### **MCR**

35. Participants should estimate the additional expenses that would be incurred if they had entered 'solvent run-off' on the date to which QIS applies. In 'solvent run-off,' an insurer continues trading so as to honour all existing contracts (including any policyholder options). However, new business is not accepted and renewals are not provided where this would involve issuing a new contract.

The additional expenses that need to be considered include

- Costs that the insurer would incur if it went into run-off, that it would not otherwise incur as a going concern (e.g. redundancy payments to employees)

- Costs that it would have to continue to meet without any resulting economic benefit (e.g. rent on unoccupied offices, salaries to employees until their redundancy can take effect)
- General overheads that would not have been provided in advance (e.g. directors' salaries)
- Unwinding economies of scale because the reduced scale of operation may increase the relative cost of meeting claims

Expenses should be projected for the full run-off period, allowing for the effects of inflation, and then discounted using risk-neutral discount rates. ***Participants are requested to describe the assumptions made for the purposes of projecting expenses and how they were derived.***

Fallback option: If the estimates requested above are too difficult to produce, as a fallback option we ask participants to divide your expenses in the reference year between fixed and variable costs.

In this sense costs are fixed if in case of changes in business situation of the company, it would still have to pay those costs. Included are:

- salaries to employees who would become redundant in a run-off situation for a contractual period of time,
- rent of office space for some contractual period,
- the cost of owning unnecessary property,
- other fixed costs.

Other costs would be considered variable.

Optional under the fallback option: Participants are invited to give an overall estimate of additional expenses that would fall on the company during the whole run-off period and the discounted value of those expenses.

***Please enter the above data in Sheet II.2, and provide in the questionnaire the relevant information (in the paragraph in italics above)***