

Architecture of the MCR. Pros and cons of different approaches.

Introduction

1. This paper gives an overview of the different approaches envisaged for the calculation of the MCR and intends to make an inventory of the pros and cons of each method.
2. On 19 July 2007 the European Commission has sent a letter to CEIOPS' Chair, Thomas Steffen, thanking CEIOPS for its advice to date which enabled the Commission to publish its draft Directive text on 10 July 2007.¹ This letter also set out the areas the Commission wanted CEIOPS to focus on and give advice as part of future implementing measures and supervisory guidance. The letter stated in addition that:

"With respect to the MCR, the [QIS3] report should include an analysis of the pros and cons of different approaches that could be used for its calculation using the data collected for QIS3 (including the CEIOPS modular approach, the CEA compact approach, the compact approach based solely on the standard formula as well as an approach based on a margin over liabilities)."

3. Following the QIS3 exercise, CEIOPS identified the MCR as one of the critical issues on which a decision will need to be made on political as well as on technical level.²
4. The purpose of this paper is to provide an assessment of the three³ MCR approaches detailed by the European Commission above. Quantitative results and qualitative feedback from QIS3 on the two approaches tested have been added.

¹ Letter of Director-General Jorgen Holmquist to CEIOPS (19/7/2007) available at http://ec.europa.eu/internal_market/insurance/solvency_en.htm

² CEIOPS' letter to Director-General Jorgen Holmquist accompanying the publication of the QIS3 report, 20 November 2007, available at http://www.ceiops.eu/media/docman/public_files/publications/submissionstotheec/2007-11-20%20QIS3%20Report%20letter%20J.%20Holmquist.pdf; QIS3 report, November 2007, p. 14, available at http://www.ceiops.eu/media/docman/public_files/publications/submissionstotheec/CEIOPS-DOC-19-07%20QIS3%20Report.pdf

³ The CEA compact approach and the compact approach based solely on the standard formula are two variants of the same approach, with the MCR equal to a percentage of the SCR.

Background

5. The main categories of calculation methods that have been envisaged are:
 - **A modular approach:** this method consists in aggregating capital charges for the different risks the company is exposed to, in a simpler way than for the SCR taking into account underwriting risk and market risk; this proposal was tested by CEIOPS in QIS3;
 - **A fixed percentage of the SCR:** the CEA suggested a MCR equal to 1/3 SCR, using the firm's calculation method (standard formula or internal model). The European Commission rejected using an internal model in the Solvency Working Group, but an alternative compact approach deemed acceptable was a percentage of the SCR using solely the standard formula (even for firms using an internal model for their SCR calculation). Both variants will be considered here.
 - **A fixed percentage of the technical provisions:** the Commission has suggested that this so-called Margin over Liabilities (MoL) approach be back-tested to determine its calibration.

The MCR in the Solvency II Directive Proposal

5. Pending the results of QIS3, the EC did not take a final decision on the architecture of the MCR in its Directive Proposal. However, the Directive Proposal specifies the definition of the MCR, and provides some guidelines on the design and calibration in Articles 125 to 128. Non-compliance with the MCR is dealt with in Articles 136 and 141. The publication of the breach of the MCR is detailed in Articles 50 and 53.
6. The main Article in the Directive Proposal concerning the MCR is Article 126. It states the following:
 - "1. The Minimum Capital Requirement shall be calculated in accordance with the following principles:*
 - (a) it shall be calculated in a clear and simple manner, and in such a way as to ensure that the calculation can be audited;*
 - (b) the Minimum Capital Requirement shall correspond to an amount of eligible basic own funds below which policyholders and beneficiaries are exposed to an unacceptable level of risk if insurance and reinsurance undertakings were allowed to continue their operations;*
 - (c) the level of the Minimum Capital Requirement shall be calibrated to the Value-at-Risk of the basic own funds of an insurance or reinsurance undertaking subject to a confidence level in the range of 80% to 90% over a one-year period;*
 - (d) it shall have an absolute floor of 1 000 000 EUR for non-life insurance and reinsurance undertakings and 2 000 000 EUR for life insurance undertakings.*
 - 2. Insurance and reinsurance undertakings shall calculate the Minimum Capital Requirement at least quarterly and report the results of that calculation to supervisory authorities".*

7. The firm must inform the supervisory authority as soon as it observes non-compliance, or a risk of non-compliance, of the MCR in the coming 3 months. If the situation is not restored within 3 months of the observation of the breach, the supervisory authority must withdraw the licence (Articles 136 and 141).
8. Any breach of the MCR must be disclosed in the report on solvency and financial condition (even if it is by a small amount and even if it has been subsequently resolved). If there is non-compliance during the year and no viable recovery plan exists, the firm must immediately disclose the non-compliance of the MCR, as well as an explanation of its origin and consequences. (Articles 50 and 53).
9. Given the Directive Proposal, the assessment therefore needs to focus on the following key aspects:
 - Clear, simple and auditable: A clear and simple manner to perform the MCR calculation, especially as insurers and reinsurers are required to calculate the MCR on a quarterly basis. As breaching the MCR leads to withdrawal of the licence, there must be legal certainty attached to the calculation.
 - Safety net: the MCR is a safety net that provides for adequate capital to protect policyholders and beneficiaries against an unacceptable level of risk. This safety net function has the consequence that the MCR overrides the SCR when the latter is too low. There is agreement that the MCR, on the contrary to the SCR, does not aim at being risk-sensitive. In extreme circumstances the MCR could dominate the SCR because of a very low SCR.⁴
 - Calibration: the calibration indicated (80% - 90% VaR over a one-year time horizon) should ensure a proper interplay with the SCR in the majority of cases and also a certain risk-sensitiveness. A proper interplay means that, for the vast majority of firms, the SCR should be constantly higher than the MCR. Otherwise the MCR would drive the capital requirement on a regular basis, which would question the proper functioning of the risk-based Solvency II framework. A proper interplay is needed to ensure that there is space for a ladder of supervisory intervention. The lack of a gap between the MCR and the SCR may remove incentives to build an internal model and to have better risk management. The SCR and an independent MCR may not move in a consistent manner over time, which would make it difficult for firms to plan their capital requirements.
 - Whatever the approach, the final amount is not allowed to be lower than an absolute minimum.
10. The Directive Proposal thus gives 4 characteristics for the MCR that can be summarised as:
 - simplicity and auditability;
 - safety net;
 - calibration;
 - absolute floor.
11. The 4th characteristic is not questioned so the different MCR approaches will be judged according to the first three criteria.

⁴ One Member State does not consider that the safety net function need have the consequence of overriding the SCR, since the Directive provides other remedies for the SCR being too low. It also considers that the MCR needs a degree of risk-sensitivity if it is to function properly as a safety net.

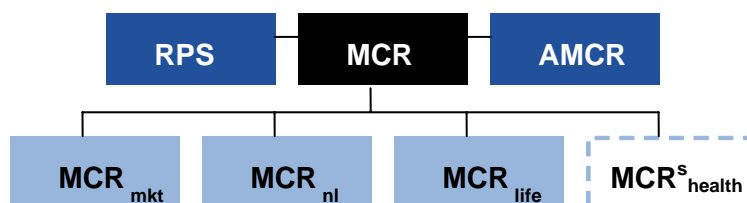
12. The notion of simplicity can be interpreted in different manners. While some consider that simplicity must reside only in the calculation, others consider that both the calculation and the input data must be simple. The question relates especially to the assessment of the compact approach (MCR equals a percentage of the SCR): should a method that involves the calculation of a percentage of a result stemming from a complex model (or complex standard formula) be regarded as a simple method? The method is obviously "time-saving" given that the complex calculations have already been carried out, but it is not "non-complex".
13. Stand-alone calculations are required in all proposed methods except the compact approach in alternative 1 (percentage of the SCR, whether calculated through an internal model or the standard formula). As such, some members view stand-alone approaches as an unnecessary administrative burden.
14. Auditability has also been much discussed. Different views have been expressed, ranging from considering that technical provisions are not auditable to stating that the SCR internal model result is potentially auditable.
15. Although all criteria should be respected, the relative importance given to some criteria over others can guide the choice of design of MCR. However, Member States seem to have different views as to the relative importance of these criteria. For the majority of the Member States, the main criteria are simplicity and auditability, and safety net. For others it is the calibration and the consequence on the interplay with the SCR that are most crucial. From this difference of views follows a different evaluation of the MCR approaches.
16. There are links between the MCR and other aspects of the Solvency II system: capital add-ons, group support regime and the treatment of "old" composites⁵. The issue of composites is mentioned below because it can be considered to be common to several approaches; the issues of groups and add-ons are mentioned under the compact approach where the direct link between the MCR and SCR can be problematic.
17. For composites dating from before the third life Directive, a notional life MCR and a notional non-life MCR need to be calculated (Article 72 of the Solvency II Directive Proposal). Therefore any input to the MCR calculation will need to be split between life and non-life. This difficulty could be more of a technical nature. However, assets also need to be split between life and non-life. Several approaches are affected by this difficulty. Such difficulties are proportionate to the complexity of asset-side inputs in the different approaches to the calculation of the MCR.
18. This paper will examine the possible approaches for calculating the MCR. For the three approaches that have been proposed before the end of QIS3 in June 2007 (modular approach, percentage of SCR and percentage of technical provisions), a brief description of the approach will be followed by an assessment according to the criteria listed above and a short QIS3 feedback. A table summarizing the major advantages and drawbacks between these three categories of approaches

⁵ Composites dating back from before the Third Directives adopted in 1992: Council Directive 92/96/EEC of 10 November 1992 on the coordination of laws, regulations and administrative provisions relating to direct life assurance and amending Directives 79/267/EEC and 90/619/EEC (**third life insurance Directive**) and Council Directive 92/49/EEC of 18 June 1992 on the coordination of laws, regulations and administrative provisions relating to direct insurance other than life assurance and amending Directives 73/239/EEC and 88/357/EEC (**third non-life insurance Directive**)

has been drawn. Additionally, two new approaches will also be suggested: the combined and the linear approaches. The combined approach consists in the higher number between a percentage of the SCR and a percentage of technical provisions. The linear approach has been developed following QIS3 criticism of the modular approach, to simplify this modular approach. Finally, the paper relates the decision taken by CEIOPS Members on the testing proposal for QIS4.

1/ Modular approach

19. QIS3 participants were asked to calculate the MCR as the aggregation of capital charges covering market risk and underwriting risk, adjusted by deducting a reduction for profit sharing (RPS). The two modular approaches tested in the QIS3 shared a common base for the life and non-life underwriting components, both factor-based, with only a top-level adjustment to capture the risk mitigating properties, similar to the approach tested for the SCR in QIS2.



20. For market risk, two alternatives were tested under QIS3:
- **Alternative 1:** a simple factor-based approach based on asset-side volume measures;
 - **Alternative 2:** a more sophisticated factor-based approach, taking also into account liabilities and durations.

Assessment according to the criteria

21. **Simplicity and auditability:** The calculation is simple and the required input data is relatively simple, more so in the first alternative than in the second. The first alternative is auditable (the calculation is based only on data available in the audited annual accounts, see also paragraph 53), while the second alternative is not.
22. **Safety net:** It is a stand-alone calculation that provides capital in the MCR to cover market and underwriting risks. For these risks it provides a safety net for the SCR calculation, which can be subject to model errors.
23. **Calibration and interplay:** The modular approach was calibrated to the defined confidence level. However, calculating the reduction for profit-sharing in a different way in the MCR and the SCR (KC factor) seems to have been a source of poor interplay for life firms.
24. The modular MCR is an independent calculation from the SCR and therefore there may be instances of the MCR being higher than the SCR.

QIS3 feedback – quantitative and qualitative

25. Quantitative results can be summarised as follows:
- For non-life firms, the results for both MCR alternatives were broadly consistent with the calibration target and indicated an adequate interplay with the SCR. In the first alternative, the MCR nowhere exceeded 70% of the SCR. Somewhat larger deviations and more outliers were observed under the second alternative, including some cases where the MCR was higher than the SCR.
 - For life firms, both MCR alternatives showed poor interplay with the SCR in some countries, and wide differences between countries and individual insurers. In those countries where reductions for profit sharing were used,

negative MCR results were common (i.e. before applying the AMCR floor). In the case of life firms, the results under the second alternative were more stable than under the first alternative, but even so they did not show a proper interplay with the SCR in all countries. The different approaches to market risk in the SCR and MCR were also singled out as a cause for poor interplay. In some members' view, these problems are effectively mitigated if the second alternative of the modular MCR is applied.

In life, these findings are largely attributable to the fact that the design of the MCR (factor-based) is very different from that of the SCR (scenario-based) and that the calculation of the reduction for profit sharing (RPS in MCR and KC-adjustment in SCR) is one of the key factors distorting the interplay between the MCR and the SCR.

26. Qualitative feedback – regarding simplicity and auditability:

The first alternative relied on a small number of basic volume measures (like market value of equity, property, technical provisions, capital at risk etc.), so it was easy to calculate in QIS3. It could be considered as auditable in non-life.

Some respondents commented that the modular MCR calculation is unduly complex; in particular, the calculation of market risk in the second alternative was difficult for some smaller firms. There was also some uncertainty about how to interpret the adjustment for profit sharing.

27. Regarding the safety net function, some respondents noted that, for life firms, the negative (or, after applying the absolute floor, very low) results observed in life due to the deduction of the profit sharing adjustment do not provide an adequate safety net. Most respondents and members regard these very low results as a flaw of the methodology, since the resulting MCR is unable to provide a meaningful protection for policyholders.

- However, one member commented that a negative MCR may be a correct outcome from a risk perspective if future profit sharing is able to completely absorb losses in the context of the ultimate intervention⁶, and that that the absolute floor will override negative MCR results

28. Regarding calibration and interplay with the SCR: Respondents noted the lack of a proper interplay specifically in life, and expressed concern about the resulting poor supervisory ladder, the inconsistency between the MCR and the SCR, and the difficulties this would entail in their capital planning and management. A number of respondents also criticised the modular approach for inhibiting incentives to good risk management.

29. However, some members note that the MCR is a requirement that is not constructed for risk management purposes. In practice, insurers should hold capital far in excess of the MCR, so that inconsistencies between MCR and SCR do not pose a risk management problem.

⁶ It is noted that if the part of future discretionary benefits that is not irreversibly committed to policyholders were treated as tier 1 basic own funds eligible to cover the MCR, or the MCR and the SCR, the issue of negative MCR would be avoided. However the discussion of this suggestion is outside the scope of this note.

2/ A fixed percentage of the SCR

30. This approach, so-called compact approach, could be calculated in two ways:
- **Alternative 1:** in its proposal for QIS3, the CEA suggests that the MCR should be calculated as a fixed percentage of the SCR of an insurer calculated by either the standard formula or an internal model.
 - **Alternative 2:** MCR calculated as a fixed percentage of the standard formula SCR, even when the firm uses in fact an internal model.

Assessment according to the criteria

31. **Simplicity and auditability:** The calculation is simple and requires minimal additional effort. There is no stand-alone MCR calculation required in alternative 1. In alternative 2, while this is also true for the firms using the standard formula, firms using an internal model have a major administrative burden because they need to calculate the standard formula in addition to applying their internal model permanently.⁷
32. The clear burden for firms using an internal model in the second alternative could be a disincentive to build an internal model.
33. The calculation is simple in appearance, but it relies on the very complex SCR calculation in fact, involving both a very high number of input data and complex calculations.
34. Interim calculation would be very difficult due to the complexity of the SCR calculation. To avoid this difficulty, the CEA suggested re-expressing the SCR as a percentage of technical provisions for interim calculations. The CEA has argued that such reference to technical provisions would also ensure auditability. In those cases however when (due to a significant change in the risk profile) the Directive requires a full interim SCR update, the MCR would be automatically updated as well.
- Some members however comment that this shortcut adds another layer of complexity, making the MCR dependent on both the SCR and the technical provisions at the previous year's end, creating uncertainty if the amounts are very different. There is also a possibility that the SCR and the technical provisions would not move in parallel during the year.
35. The result of the SCR calculation cannot be audited.
- It could be argued that this would affect the legal certainty of the calculation.
 - A few members envisage that the SCR could be made auditable in the future.
36. **Safety net:** This approach puts into question a fundamental design choice of Solvency II which is to have two capital requirements: an MCR equal to a percentage of the SCR is equivalent to having only one capital requirement.
37. The MCR will always be lower than the SCR, even when the latter is very low. Therefore this approach would not provide a safety net against a very low SCR.

⁷ However, some members consider that compared to the complexity of an internal model the burden of an additional SCR standard formula calculation is low.

However, under this approach, the MCR will provide capital to cover all the risks the company is exposed to and ensures that the MCR cannot be exceptionally low compared to the SCR.

38. Any potential flaws in the design of the SCR standard formula would be duplicated in the MCR, with the risk that 'ultimate supervisory action' is taken too late.
39. Alternative 2 provides more comfort for those supervisors who are uneasy about basing a safety net MCR on an internal model.
40. **Calibration and interplay with the SCR:** In the first alternative (and in the second alternative only for firms using the standard formula for their SCR calculation), proper interplay with the SCR is automatically ensured, allowing for a proportionate and escalating ladder approach to intervention (unless the absolute floor has to be used for the MCR).
41. The MCR adapts instantly to any changes in the SCR design. Given that it is a simple percentage, the MCR is very flexible: if through experience the percentage is deemed too low or too high, then it can easily be revised. It allows for risk mitigation to be taken into account to the same extent as in the SCR calculation.
42. Unless all distributions follow the same law, there is no linear relation between a x% VaR and a y% VaR. Therefore the MCR defined as a percentage of the SCR, i.e. a percentage of the 99,5% VaR, will not reflect a uniform level of confidence, unless all insurers share the same risk profile.⁸
43. **Link with the group support regime** in the Directive Proposal: Supervisors, who are solo supervisors of firms belonging to a group under the group support regime, would lose the MCR as control level if it is linked to the SCR, which is a source of major concern.

Under the group support regime laid down by the Directive Proposal, the MCR serves at the same time as the intervention level for calling on group support, and (in case this failed) as the trigger level for reverting to solo supervision and for the ultimate intervention. Therefore the MCR is a key control level for the solo supervisor.

Under group supervision, internal models are approved at the group level (Article 238). Furthermore, according to Article 245, under the group support regime, other key decisions affecting the SCR – while they may be proposed by the solo supervisor – are ultimately delegated to the group level: these include the imposition of capital add-on on an internal model or the standard formula, and the decision to require a subsidiary to revert to the standard formula. These decisions will have a direct impact on the MCR. The lack of a decision – either because the group and the solo supervisors disagree, or simply because of the delay resulting from involving the group supervisor in the loop – will also impact the enforceability and the timeliness of MCR level intervention.

44. **Link with capital add-ons:** In the compact approach, it is an open question whether SCR add-ons should also apply to the MCR. There are two options, both of which raise further issues:
 - The first option is that (a fixed percentage of) a capital add-on would also apply to the MCR. A capital add-on, imposed by the supervisor, may be

⁸ However, a clear and uniform link to a given confidence level is missing in the other approaches as well.

challenged by an insurer before the court, thus complicating the enforcement of the MCR as an ultimate trigger.

- Alternatively, the MCR could be exempted from the capital add-on. Given that an add-on is imposed when the SCR is an inadequate measure of the insurer's risk profile, or when the insurer's risk management is deficient, not applying the add-on to the MCR would arguably erode the level of protection provided by the MCR.

45. **Small firm effects:** For small firms, if the MCR is linked to SCR internal models, concerns have been expressed that this could leave small market participants – who are less likely to benefit from diversification or internal model effects – at a competitive disadvantage.

QIS3 feedback – qualitative

46. Most of the supervisors reported that QIS3 participants who commented on the CEA compact approach expressed support. In several countries, most respondents preferred this approach over the modular approach because it would provide a proper supervisory ladder.

47. In one country, an explicit comment was made on the preference of smaller firms, who preferred the modular approach in non-life to the compact approach.

3/ A fixed percentage of the technical provisions

48. It has also been envisaged to calculate the MCR as a percentage of the technical provisions, more precisely as a percentage of the best estimate⁹.

49. The Swiss supervisory authority is considering introducing in its new solvency system an MCR equal to 1% of the market value of liabilities for life insurance business; and 4% of the market value of liabilities for non-life insurance business.

50. Some important differences between the Swiss approach and Solvency II should however be noted:

- The Swiss approach includes an intermediate control level between the SCR and the MCR.
- Although there is no direct link to a specific confidence level, the Swiss MCR is generally significantly lower than the 80%–90% VaR level envisaged in the Directive Proposal (roughly corresponding to 10% of the SCR).
- Under the Swiss approach, discretionary bonuses are not allowed for in the technical provisions for MCR purposes.

51. This approach, so-called margin over liabilities (MoL), has not been tested under QIS3 and would need to be refined. Especially, the question of how to take account of reinsurance will arise. Also, given the product diversity across Europe, it is very unlikely that a flat percentage of technical provisions for life and non-life will produce an acceptable MCR. Thus, the MCR could be defined as: $\alpha \times \text{gross TP} + \beta \times \text{net TP}$, with the possibility of using different factors for different lines of business.

⁹ Applying the percentage on the whole provision would imply a calculation of the risk margin, and thus of the SCR. Thus some of the drawbacks pointed out in the compact approach would also apply to this method.

Assessment according to the criteria

52. **Simplicity and auditability:** The calculation is very straightforward. As it is simple, it is suitable for interim calculation.¹⁰
53. It would probably be auditable. If the calculation of technical provisions for solvency purposes is easily reconcilable with the accounting technical provisions, published in the financial report and accounts, this provides an auditable basis for the MCR.¹¹ It would be defensible in a court of law.
54. It is a flexible approach. If experience with certain percentages is deemed too low or too high then they can be easily amended.
55. **Safety net:** It is a stand-alone calculation and provides a safety net for the SCR calculation which can be subject to model errors.
56. Technical provisions are a good, though rough, proxy of the risks a company is exposed to. Any potential flaws in the calculation of the technical provisions would be duplicated in the MCR, with the risk that 'ultimate supervisory action' is taken too late. The calculation could be made more granular to add an increased level of risk sensitivity for a certain line of business or homogeneous risk group by separately treating it in the calculation if it was deemed necessary.
57. However, this approach is less risk-sensitive than the current Solvency I requirement, which also takes into account premiums in non-life and capital at risk in life. It also does not explicitly reflect market risk, operational risk and it poorly reflects underwriting risk for some product types (e.g. short term business). Where such risks dominate an insurer's risk profile, the margin over liabilities approach will probably underestimate the risk.
 - Therefore some members suggest using the calculation in combination with at least another calculation.¹²
58. It is an incentive for insurers to underestimate their provisions in order to have a lower capital requirement. However, it has to be noted that this is only a second order effect¹³.
59. **Calibration and interplay:** There is no actuarial link between a percentage of the technical provisions and a confidence level for the risk of ruin of the company over a one-year period¹⁴.
60. There may be instances of the MCR being higher than the SCR.

¹⁰ However, some members noted that if the non-life technical provisions should be actuarially calculated on a quarterly basis, this would be a burdensome process for small undertakings.

¹¹ Note however that all other approaches too use technical provisions as an input. Therefore if the auditability of technical provisions is questioned, this would affect the auditability of all MCR approaches discussed in this note.

¹² Two new approaches have been suggested (combining the MoL approach with the CEA approach; combining the MoL approach with premium, capital at risk and asset side volume measures). These will be examined under approaches 4 and 5.

¹³ Undertakings in financial difficulty will tend to underestimate their technical provisions, whether the MCR is based on the technical provisions or not.

¹⁴ However, it has to be noted that this link is not much clearer for both other approaches.

61. The interplay properties of the approach have not been tested in QIS3. However, if there were interplay problems, the formula could be adjusted either by adding granularity, or by lowering the factors. The Swiss experience suggests that even a non-granular formula can avoid the interplay problem if the factors are sufficiently low.
62. It is a question however whether a proper interplay can be achieved without compromising the overall calibration target (80-90% VaR). Initial calculations on QIS3 data suggest that this is probably possible for non-life. The treatment of life business seems more difficult and would need further examination.
63. There are concerns that reduction for profit sharing would not be properly reflected in this approach. When discretionary bonuses are used to cover up losses, technical provisions will decrease while the risks increase as the mitigating effect of bonuses is no longer available. A low margin would underestimate the risk in times of stress, while a high margin would give a too high MCR and interplay problems in normal times.
 - It is noted however that it is possible to apply different factors to discretionary and guaranteed benefits. A zero or even a negative factor for discretionary bonus provisions might also be contemplated.
 - In any case, the link of this approach with the reduction for profit sharing would need to be carefully considered.

QIS3 feedback – quantitative

64. Although the approach was not tested in QIS3 because CEIOPS does not recommend a flat-percentage margin over liabilities approach for Solvency II, the results of the study allow a tentative first insight about the effects of a flat-percentage approach like the Swiss one.
 - The results confirm that the Swiss 1% and 4% factors, when applied to QIS3 (net) technical provisions, are roughly compatible with an MCR equal to 10% of the SCR, which was the Swiss objective.
 - The non-life results, when scaled up by a factor of 3 to 4, indicate an acceptable interplay with the SCR and are broadly consistent with the calibration target even in a flat-percentage approach. It is expected that in a more granular calculation (within QIS3 segmentation) these results could be further improved.
 - Direct scaling-up of a flat-percentage formula does not provide an acceptable interplay in life. Apparently the granularity of the life calculation would need refinement. It seems that a workable solution would be probably more granular than the QIS3 life segmentation.
 - In both life and non-life it is difficult to avoid that the MCR for some firms is significantly below the target. This is because there are risks that technical provisions do not properly reflect.

4/ Summary table of the advantages and drawbacks of the different approaches¹⁵

	Modular approach	% SCR standard formula	% Techn. Prov.
Simple formula	Yes	Yes	Yes
Simple input information	Yes (1 st alternative simpler than second).	No	Yes
Suitable for quarterly calculation	Yes in non-life. The RPS calculation is an issue in life.	No	Yes
Auditable	Yes (except market risk in alternative 2).	No	Yes
Safety net	Yes	No	Yes
Link with a confidence level	Yes (problem caused by reduction for profit sharing).	Yes (but underlying hypothesis: all insurers have the same risk profile).	No
Risk-sensitive	Yes (limited risk sensitivity in life).	Yes (all risks).	Partly (underwriting risk).
Interplay with the SCR	Yes in non-life, problematic in life	Yes (except if SCR internal model).	Not yet tested.

¹⁵ This table reflects the opinion of the majority of the Member States represented in the CEIOPS Financial requirements Expert Group. For its purpose, which is to summarise the pros and cons of the approaches, the table does not contain all nuances that have been set out in the text.

5/ Combined approach

65. The proposal for a combined approach follows from the observation that the compact and the margin over liabilities approaches have complementary advantages. The combination of the two approaches therefore has a potential for good quantitative properties, combining an effective safety net function with proper interplay, and the ease of adapting the calibration.
66. In a combined CEA-MoL approach, the MCR is determined as **the higher of** the following two results:
- **a fixed percentage (x%) of the SCR**, as calculated by the standard formula or an internal model (first alternative of the compact approach), and
 - **a margin-over-liabilities formula** (3rd approach) applying fixed factors to technical provisions (at an appropriate granularity).
67. The calibration of such an approach can be fine-tuned by the choice of the percentages x and y. The setting of these percentages would also determine whether the properties of the CEA or the MoL formula dominate the resulting MCR.

Assessment according to the criteria

68. The advantages and disadvantages of this approach follow from the properties of the two components which have been discussed above. Therefore below we give only a brief summary of the pros and cons of their combination.
69. **Simplicity and auditability:** The calculation is simple and requires minimal additional effort.
70. However, it imports the legal certainty concerns related to the CEA compact approach: it is not auditable, it lessens the control of solo supervisors over solo entities belonging to a group under the group support regime, it would raise difficulties with composites, etc. However these concerns are mitigated by the fact that the MoL component would set an independent floor for results derived from internal models.
71. **Safety net:** Regarding the safety net function, the approach combines the advantages of the MoL and the compact approaches. The margin over liabilities component could provide an effective safety net when a firm's SCR is very low. The SCR-based component would provide risk sensitivity and a safety net against those risks that the MoL formula alone is unable to capture (e.g. a high market risk profile).
72. **Calibration and interplay:** The calibration of this approach is easy to adapt – by adjusting the calibration of the two components, an appropriate calibration could probably be achieved. Regardless of the calibration, there may be instances of the MCR being higher than the SCR. ¹⁶

¹⁶ A proposal have been put forward to include also a cap in the MCR, e.g. at 80% of the SCR. This however would bring into question the safety net function of the MCR, as it would no longer be able to override an abnormally low SCR (cf. para 9).

6/ Linear approach

73. The linear approach suggested below aims at respecting the various criteria developed in the Directive Proposal, but putting special emphasis on simplicity, auditability (to give legal certainty before the courts when the license is being withdrawn) and safety net.
74. The linear approach simplifies the modular approach. It builds on the percentage of technical provisions, but makes it more risk-sensitive by adding other volume measures.
75. In non-life, the "linear" MCR is determined as the **sum** of the following calculations:
- **The higher between**
 - **a fixed percentage (x%) of premiums** (at an appropriate granularity), reflecting underwriting risk for short-term business;
 - **a fixed percentage (y%) of net technical provisions** (at an appropriate granularity), reflecting underwriting risk for long-term business; and
 - **a fixed percentage of assets** (at an appropriate granularity), net of cash deposits, and net of off-balance sheet collaterals, reflecting market risk.
76. The MCR described above would be similar to the current UK Enhanced Capital Requirement in non-life. This ECR is the sum of fixed percentages of premiums (with a granularity of 24 lines of business), fixed percentages of net technical provisions (24 LoB) and fixed percentages of assets (27 classes of assets).
77. In life, the "linear" MCR is determined as the **sum** of the following calculations:
- **a fixed percentage (a%) of net technical provisions** excluding unit-linked business (at an appropriate granularity), reflecting underwriting risk for long-term business;
 - **a fixed percentage (b%) of net technical provisions for unit-linked business**;
 - **a fixed percentage of capital at risk (c%)**, at an appropriate granularity, depending on the duration.
 - **a fixed percentage of assets** (at an appropriate granularity), net of cash deposits, and net of off-balance sheet collaterals, reflecting market risk and net of unit-linked assets.
78. The appropriate granularity and calibration at European level would probably need to be further discussed – this approach is sufficiently flexible and simple to also be adapted once the system is in place.

Assessment according to the criteria

79. **Simplicity and auditability:** The calculation is quite simple, and it is also auditable.
80. **Safety net:** It provides an effective safety net, reflecting also some risks that are not captured by the simple MoL approach.

81. **Calibration and interplay:** The interplay properties of the approach have not been tested in QIS3. Regardless of the calibration, there may be instances of the MCR being higher than the SCR.
- Some members note that the approach is structurally similar to the modular approach (alternative 1) tested in QIS3 (but without reduction for profit sharing). Therefore it would possibly to display similar interplay problems for life business, particularly if the treatment of the profit sharing adjustment in the SCR remains unchanged.
 - To avoid this problem (and also the issue of composites, the issue of free assets and issues over economic substance versus legal form), some members suggested to omit the risk charge on assets from the approach.
82. Some members prefer the linear approach under the condition that it is not linked to assets.

7/CEIOPS' decision on the design of the MCR for QIS4 purposes

83. At CEIOPS Members' Meeting held on 29-30 October 2007, its Members were asked for their opinion on the approach that should be tested in the QIS4 exercise.
84. The Members agreed that the linear approach (without taking into account the assets) would be tested for life and non-life.
85. The Members underlined that this testing proposal does not constitute a final decision on the design of the MCR for the SII framework. Most Members agreed that the modular approach applied to non-life business, tested in QIS3, was in particular considered to be an adequate option.
