

**Final CEIOPS' Advice for
Level 2 Implementing Measures on Solvency II:
Technical Provisions – Article 86 (d)
Calculation of the Risk Margin**

(former CP 42)

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1. Introduction

- 1.1. In its letter of 19 July 2007, the European Commission requested CEIOPS to provide final, fully consulted advice on Level 2 implementing measures by October 2009 and recommended CEIOPS to develop Level 3 guidance on certain areas to foster supervisory convergence. On 12 June 2009 the European Commission sent a letter with further guidance regarding the Solvency II project, including the list of implementing measures and timetable until implementation.¹
- 1.2. This paper aims at providing advice with regard to the calculation of the risk margin as requested in Article 86(d) of the Solvency II Level 1 text.²
- 1.3. The objective of this paper is to specify the overall structure of the calculation of the risk margin, including the following aspects:
 - the definition of the reference undertaking, including the assumptions this undertaking has to fulfil; and
 - the stipulation of the Cost-of-Capital rate.
- 1.4. Further advice on simplified approaches for calculating the risk margin, including projections of the future SCRs related to the reference undertaking, is given in CEIOPS' advice on simplifications for calculating the technical provisions (CEIOPS-CP-76/09).³

¹ See <http://www.ceiops.eu/content/view/5/5/>

² Latest version from 19 October 2009 available at <http://register.consilium.europa.eu/pdf/en/09/st03/st03643-re01.en09.pdf>

³ See <http://www.ceiops.eu/index.php?option=content&task=view&id=658>.

2. Extract from Level 1 Text

2.1 Legal basis for implementing measures

- 2.1 According to the guiding principles referred to in the Commission's letter, the legal basis for the advice presented in this paper is found in Article 86(d) and (h) of the Level 1 text, which states:

Article 86 – Implementing measures

The Commission shall adopt implementing measures laying down the following:

[...]

- (d) the methods and assumptions to be used in the calculation of the risk margin including the determination of the amount of eligible own funds necessary to support the insurance and reinsurance obligations and the calibration of the Cost-of-Capital rate;*

[...]

- (h) where necessary, simplified methods and techniques to calculate technical provisions, in order to ensure the actuarial and statistical methodologies referred to in point (a) and (d) are proportionate to the nature, scale and complexity of the risks supported by insurance and reinsurance undertakings including captive insurance and re-insurance undertakings.*

2.2 Other relevant Level 1 text providing background to the advice

- 2.2. Article 76(2) and (4) as well as Article 77(1), (3) and (5) are especially relevant for the implementing measures on the risk margin.

Article 76 – General provisions

[...]

- 2. The value of technical provisions shall correspond to the current amount insurance and reinsurance undertakings would have to pay if they were to transfer their insurance and reinsurance obligations immediately to another insurance or reinsurance undertaking.*

[...]

- 4. Technical provisions shall be calculated in a prudent, reliable and objective manner.*

Article 77 – Calculation of technical provisions

1. *The value of technical provisions shall be equal to the sum of a best estimate and a risk margin [...]*
3. *The risk margin shall be such as to ensure that the value of the technical provisions is equivalent to the amount insurance and reinsurance undertakings would be expected to require in order to take over and meet the insurance and reinsurance obligations. [...]*
5. *Where insurance and reinsurance undertakings value the best estimate and the risk margin separately, the risk margin shall be calculated by determining the cost of providing an amount of eligible own funds equal to the Solvency Capital Requirement necessary to support the insurance and reinsurance obligations over the lifetime thereof.*

The rate used in the determination of the cost of providing that amount of eligible own funds (Cost-of-Capital rate) shall be the same for all insurance and reinsurance undertakings and shall be reviewed periodically.

The Cost-of-Capital rate used shall be equal to the additional rate, above the relevant risk-free interest rate, that an insurance or reinsurance undertaking would incur holding an amount of eligible own funds, [...] equal to the Solvency Capital Requirement necessary to support the insurance and reinsurance obligation over the lifetime of that obligation.

- 2.3 Moreover, with respect to the specification of the reference undertaking, reference should be made to recitals (55) and especially (56):

(55) *The value of technical provisions should therefore correspond to the amount an insurance or reinsurance undertaking would have to pay if it transferred its contractual rights and obligations immediately to another undertaking. Consequently, the value of technical provisions should correspond to the amount another insurance or reinsurance undertaking (reference undertaking) would be expected to require to take over and meet the underlying insurance and reinsurance obligations. The amount of technical provisions should reflect the characteristics of the underlying insurance portfolio. Undertaking-specific information should therefore only be used in their calculation insofar as that information enables insurance and reinsurance undertakings to better reflect the characteristics of the underlying insurance portfolio, such as information regarding claims management and expenses.*

(56) *The assumptions made about the reference undertaking assumed to take over and meet the underlying insurance and reinsurance obligations should be harmonised throughout the community. In particular, the assumptions made about the reference undertaking that determine whether or not, and if so to what extent, diversification effects should be taken into account in the calculation of the risk margin should be analysed as part of the impact assessment of*

implementing measures and should then be harmonised at Community level.

3. Advice

3.1 Explanatory text

3.1.1 Previous advice

- 3.1. In its “Further advice to the European Commission on Pillar 1 issues” of March 2007, CEIOPS discussed in some detail the merits of the percentile approach and the Cost-of-Capital approach, respectively, for calculating the risk margin.⁴
- 3.2. At that time the European Commission had decided that only the Cost-of-Capital Approach should be tested in the third Quantitative Impact Study (QIS3). On the other hand the Commission’s proposal for a Solvency II Level 1 text had not yet been published, and especially the important concept of “a reference undertaking” had not been launched.⁵
- 3.3. However, CEIOPS’ advice from March 2007 contained several considerations that in general are still relevant:

To achieve a harmonised approach that is consistent with the supervisory objectives for a risk margin in technical provisions, for a solvency application of a Cost-of-Capital approach, the key parameters and assumptions underlying such an approach would need to be set, including:

- *the definition of the future 'capital' to be considered (it would need to be specified that this is the regulatory capital requirement);*
- *the setting of the Cost-of-Capital factor (for example, whether 'stressed' factors would need to be used);*
- *assumptions regarding the extent to which diversifiable risks would need to be taken into account; and*
- *assumptions regarding the extent to which future financial risks would need to be taken into account.*⁶

⁴See <http://www.ceiops.eu/media/files/publications/submissionstotheec/CEIOPS-DOC-08-07AdviceonPillarI-Issues-FurtherAdvice.pdf>, CEIOPS-DOC-08/07, March 2007, para 3.72-3.101 (pp. 37-43) (hereafter “Advice of March 2007”). In addition, reference was made to a stress-testing approach for life insurance.

⁵ Hence, in CEIOPS-DOC-08/07 two (alternative) objectives of the risk margin (cf. e.g. para 3.72) were still mentioned: (i) to transfer the portfolio of liabilities to another (re)insurer with a sufficient high level of confidence or (ii) to recapitalise the undertaking with a sufficiently high level of confidence to ensure a proper run-off scenario of the original undertaking.

⁶ Advice of March 2007, para 3.83.

- 3.4. Especially, with respect to the choice of method for calculating the risk margin the Advice of March 2007 advice stated that:

CEIOPS agrees that for non-hedgeable risks the cost of capital approach should be used under certain preconditions to be defined in the Framework Directive.

Reflecting existing market uncertainties the cost of capital must consist of a risk margin that meets the objectives either to transfer the portfolio to a third party or to recapitalise the company to ensure a proper run-off scenario by the original undertaking.⁷

The calibration of the risk margin must not be left to the discretion of undertakings but key parameters and assumptions should be prescribed by supervisors on level 3 using historical volatilities in credit spreads for a BBB rating (corresponding to a 99.5 % confidence level) or applying current credit spreads for BBB but adding a stress scenario to also be developed on level 3.⁸

- 3.5. These considerations were also reflected in the specific advice on the principles for calculating the technical provisions.⁹

3.1.2 The risk margin in QIS4

3.1.2.1 The QIS4 Technical Specifications

- 3.6. The QIS4 Technical Specifications (TS)¹⁰ contained a rather detailed overview of (general) principles for calculating the risk margin, a detailed list of assumptions on which the risk margin calculations should be based as well as proposals for several layers of simplifications and proxies that could be used in these calculations.
- 3.7. As it seems likely that large parts of these principles and assumptions can be carried over to the Level 2 implementing measures regarding the risk margin calculations (or the future Level 3 supervisory guidelines regarding these calculations), this part of the QIS4 TS is summarised only briefly in the paragraphs below.
- 3.8. It should be noted from the outset that the concept “reference undertaking” is not explicitly referred to in the QIS4 TS. This is being developed further in section 3.1.3 below. However, as a part of the preparation for the QIS4 exercise, CEIOPS had elaborated a background paper setting out proposals for the assumptions and characteristics that the reference undertaking should satisfy.¹¹

⁷ The recapitalisation and run-off by the original undertaking is no longer an alternative option for the risk margin assessments.

⁸ Advice of March 2007, para 3.99-3.101.

⁹ Cf. Advice of March 2007, para 3.118, 3.120 and 3.121.

¹⁰ See <http://www.ceiops.eu/media/docman/Technical%20Specifications%20QIS4.doc>.

¹¹ See the QIS4 background document: Guidance on the definition of the reference entity for the calculation of the Cost-of-Capital (CEIOPS-DOC-09/2008), http://www.ceiops.eu/media/docman/public_files/consultations/QIS/Cost%20of%20Capital%20Reference%20Undertaking.pdf

- 3.9. With respect to the general principles for the risk margin calculations, the QIS4 TS stated that:

The value of the technical provisions is equal to the sum of a best estimate and a risk margin. The best estimate and the risk margin should be valued separately, with the exception of hedgeable (re)insurance obligations [...].

[...]

The risk margin is such as to ensure that the value of technical provisions is equivalent to the amount that (re)insurance undertakings would be expected to require to take over and meet the (re)insurance obligations.

The risk margin should be calculated by determining the cost of providing an amount of eligible own funds equal to the Solvency Capital Requirements necessary to support the (re)insurance obligations over their lifetime.¹²

These general principles mainly reproduced the relevant part of the Level 1 text, including the fact that under Solvency II a Cost-of-Capital methodology would be used for calculating the risk margin.

- 3.10. In order to make the risk margin calculations operational, the QIS4 TS introduced several assumptions to support these general principles:

- The undertakings should make projections of the development of (re)insurance obligations until their extinction and then, for each year, determine the SCR to be met by an undertaking facing such obligations (TS.II.C.2).
- The SCR-calculations should be performed on the basis of the standard formula. However, undertakings that have developed full or partial internal models were invited – on an optional basis – to communicate results of risk margin calculations based on these models (TS.II.C.4-C.5).
- The risk margins (based on the standard formula) should be calculated net of reinsurance rather than by carrying out separate calculations of the risk margin for gross technical provisions and reinsurance and SPV recoverables, respectively (TS.II.C.6).

- 3.11. With respect to the risks to be taken into account in the Cost-of-Capital calculations, the QIS4 TS laid down the following assumptions:

- The calculations should take into account the impact of underwriting risk with respect to the existing business, counterparty default risk with respect to ceded reinsurance and operational risk (TS.II.C.7).
- The insurance and reinsurance obligations should not give rise to any market risk or risk of default of the counterparties to financial derivative contracts (TS.II.C.8).

¹² TS.II.A.6, TS.II.A 14 and TS.II.A 15

- Renewals and future business should be considered only to the extent that they are included in the current best estimate of liabilities (TS.II.C.9).
- 3.12. Regarding the segmentation to be used for Cost-of-Capital calculations, the QIS4 TS requested that these calculations should differentiate between lines of business in the following manner (cf. TS.II.C.10-C.12):
- Life insurance: The portfolio should be segmented into 16 lines of business by using two steps, i.e. according to four types of contracts (first step) and for each type of contracts four types of risk drivers (second step).
 - The calculations regarding health insurance contracts with features similar to life business should be disclosed separately.
 - Direct non-life insurance: The portfolio should be segmented into 12 lines of business.
 - Proportional non-life reinsurance should be treated as direct insurance while non-proportional non-life reinsurance should be segmented into three lines of business.
- 3.13. Hence, the segmentation used in QIS4 for risk margin calculations was – with one exception – identical to the segmentation for (re)insurance obligations proposed in CEIOPS-DOC-21/09 (former CP 27).¹³ The exception concerns the Accident and Health line of business which in the QIS4 TS was split into two sub-lines of business.
- 3.14. The QIS4 TS assumed that no diversification benefits should be recognised when aggregating the technical provisions (the sum of a best estimate and a risk margin) as calculated per line of business.¹⁴
- 3.15. Regarding the Cost-of-Capital rate, the QIS4 TS requested that a rate of 6 per cent should be used by all undertakings.
- 3.16. The steps to be followed by an undertaking when calculating the risk margins under the Cost-of-Capital methodology were summarised as follows (assuming a valuation date at the beginning of year 0):
- (a) For each line of business find an SCR for year 0 – as well as for all future years throughout the lifetime of the obligations in that line of business – by taking into account the risks listed in para 3.11.
 - (b) Multiply all SCRs referred to in step (a) by the Cost-of-Capital rate in order to get the cost of holding these SCRs.
 - (c) Discount the amounts calculated in step (b) by using the risk free interest rate term structure at the valuation date (the beginning of year 0). The risk margin to be attached to the best estimate (for the given line of business) equals the sum of these discounted values.

¹³ See <http://www.ceiops.eu/index.php?option=content&task=view&id=575>.

¹⁴ However, diversification effects between the different risk modules within a given line of business were taken into account.

(d) Finally, the overall risk margin of the undertaking is given as the sum of the risk margins as calculated by lines of business (i.e. without any diversification effects).

3.17. As stated in the QIS4 TS, the main practical difficulty of the risk margin calculations consists of deriving SCRs for future years for each line of business (TS.II.C.16). Hence, in order to reduce the burden of calculation for the participating undertakings, the QIS4 TS introduced several layers of simplifications for these calculations. In addition, separate “risk margin helper tabs” for life and non-life lines of business, respectively, were integrated into the QIS4 spreadsheets.

3.1.2.2 The QIS4 report

3.18. The calculations of the risk margin under QIS4 are summarised as follows in CEIOPS’ QIS4 report:¹⁵

In general, undertakings and supervisors support the design of the proposed method for calculation of technical provisions, including the proposed simplifications and proxies. Many supervisors reported considerable consistency in the valuation approach used. However some supervisors reported that a wide variety of methods was used by undertakings with no evidence of convergence and that there was also some doubt as to whether the Technical Specifications have been applied consistently across countries.

[...]

In addition, many undertakings found the specifications for calculating the risk margin complex and hard to follow. This resulted mainly from the difficulty involved in accurately projecting the SCR. Some undertakings also felt that the segmentation of business within the risk margin was inappropriate and added considerably to the complexity of the calculation. Most undertakings commented that diversification between lines of business, between risk types, and between geographies and legal entities should be taken into account with some stating that from an economic point of view it is more correct to value the liabilities based on the undertaking’s own portfolio. A number of questions were also raised regarding the appropriateness of the 6% cost of capital rate.

The consistency of technical provisions could be improved by providing more precise guidance on the above issues.

¹⁵ CEIOPS’ report on its fourth Quantitative Impact Study (QIS4) for Solvency II (CEIOPS-SEC-82/08), <http://www.ceiops.eu/media/files/consultations/QIS/CEIOPS-SEC-82-08%20QIS4%20Report.pdf> (hereafter: QIS4 report). See section 7.1 (page 73-74) on the main findings regarding technical provisions.

3.19. With respect to the use of simplifications and proxies the QIS4-report stated that:

The majority, if not all, of undertakings (independently of their size) used simplifications to project the SCR for the purposes of calculating the risk margin. The risk margin proxy and helper tab for non-life were also extensively used by undertakings.¹⁶

3.20. Regarding the practicability and suitability of the proposed methodologies for calculating the technical provisions the feedback from undertakings participating in QIS4 was in general positive. However, the methodologies for the risk margin determination received lower marks than the methodologies concerning the best estimate valuation – especially with respect to the suitability (and reliability/accuracy).¹⁷

3.21. The QIS4 report summarised the participating undertakings' assessment of the practicability of the proposed methods to calculate the risk margin according to the Cost-of-Capital approach in the following manner:

Undertakings in most countries support the cost of capital approach for determining the value of the risk margin for non-hedgeable risks. They consider the CoC-approach as clear, the CoC methodology as appropriate and practicable and the CoC as a robust way to calculate the market value margin. [...] A number of undertakings commented on the fact that the risk margin depends to a large extent on the projected SCR so any limitations in the standard formula would also impact on the risk margin.

A number of participants criticised the technical difficulty of the risk margin calculation and the lack of more technical support.

Some undertakings stated that the calculation of the risk margin by LoBs needs a breakdown of underwriting, counterparty and operational risk SCR by LoBs that is difficult to apply.¹⁸

3.22. Regarding the suitability of the proposed approaches for calculating the risk margin "[s]ome participants commented that the descriptions and possible simplifications left too much room for interpretation and subjective judgement".¹⁹ However, according to the QIS4 report most of the comments regarding the methods for calculating the risk margin were related to the diversification effects and the cost-of-capital rate:²⁰

Most undertakings commented that diversification between lines of business, between risk types, and between geographies and legal entities should be taken into account with some stating that from an economic point of view it is more correct to value the liabilities based on the undertaking's own portfolio.

[...]

¹⁶ QIS4 report, sub-section 7.2.5, page 78.

¹⁷ QIS4 report, page 85.

¹⁸ QIS4 report, see sub-section 7.3.5, page 108-109.

¹⁹ QIS4 report, page 110.

²⁰ QIS4 report, page 111.

A number of questions were raised regarding the appropriateness of the 6% cost of capital rate and the work of the CRO Forum was referenced by several undertakings. They argued that it is questionable whether such a choice would lead to a reliable proxy for the cost of transferring a portfolio to a willing third party. Others felt that the cost-of-capital factor of 6% may overstate the true CoC for companies that may hold or acquire these liabilities, and argued for a factor in the range of 2%-4% instead. [...]

Further consideration should be given to the appropriateness of the 6% cost of capital factor in light of the CRO Forum research.

3.23. The issues related to diversification effects and the choice of the Cost-of-Capital rate are discussed in more detail in the following section.

3.1.3 The overall structure of the risk margin calculations

3.24. It follows from the wording of Article 86(d) and recitals 55 and 56 of the Level 1 text, as well as from the QIS4 feedback that the implementing measure regarding the risk calculations should focus on the following aspects:

- the definition of the reference undertaking, i.e. a clarification regarding the assumptions that this undertaking has to fulfil;
- the calibration of the Cost-of-Capital rate;
- the general/overarching methodology for calculating the risk margin in accordance with the Cost-of-Capital approach; and
- simplified methods including the criteria to be fulfilled in order to apply these simplifications.

For CEIOPS' advice on simplifications regarding the risk margin calculations, see CEIOPS-CP-76/09.²¹

3.1.3.1 The reference undertaking²²

A. Assumptions to be fulfilled by the reference undertaking

3.25. In order to be able to determine "the cost of providing an amount of eligible own funds equal to the Solvency Capital requirement necessary to support the insurance and reinsurance obligations" (Article 77(5)) in a clear and unambiguous manner, the definition of the reference undertaking is a key issue. The assumptions that the reference undertaking has to fulfil if this object shall be achieved, as well as a rationale for these assumptions, are presented and discussed in the paragraphs below.

3.26. **Assumption 1:** The reference undertaking is not the undertaking itself (i.e. the original undertaking), but another undertaking.

3.27. This assumption is reasonable in light of the wording of Article 76(2) where reference is made to the current amount a (re)insurance under-

²¹ <http://www.ceiops.eu//index.php?option=content&task=view&id=658>.

²² This section is based on the QIS4 background document on the reference entity.

taking will have to pay if the (re)insurance obligations are transferred “immediately to another insurance or reinsurance undertaking”.

Moreover, by assuming that the reference undertaking is another undertaking (than the original undertaking) there is no need to make artificial assumptions regarding the original undertaking (e.g. with respect to the available capital of the original undertaking) as was the case in QIS3 – when the reference undertaking was defined as the original undertaking.

In general, it seems reasonable to believe that this assumption will reduce (if not eliminate completely) potential inconsistencies in the framework for risk margin calculations.

- 3.28. **Assumption 2:** The reference undertaking is an empty undertaking in the sense that it does not have any insurance or reinsurance obligations and any own funds before the transfer takes place.
- 3.29. By making this assumption the risk margin will depend only on the insurance and reinsurance obligations transferred to the reference undertaking and the assets covering these obligations.
- 3.30. On the other hand, if the reference undertaking is assumed to be non-empty there will be ambiguities related to the assumptions to be made regarding (the composition of) the reference undertaking’s assets and liabilities before the transfer takes place. The assumptions made may have a substantial impact on the risk margin due to the fact that the SCR-calculations allow for diversification (correlation effects) between the business existing prior to the transfer and the transferred business.
- 3.31. Moreover, if the reference undertaking is assumed to have positive eligible own funds (but no (re)insurance obligations) before the transfer, the risk margin would not measure the cost of holding an amount of eligible own funds to cover the SCR, but the cost of holding an amount of eligible own funds (at least partially) in excess of the SCR. This is not intended by the definition given in Article 77(5) of the Level 1 text and would not make much sense from an economic point of view.
- 3.32. **Assumption 3:** After the transfer the reference undertaking has eligible own funds corresponding exactly to the amount of SCR that is necessary to support the transferred insurance and reinsurance obligations.
- 3.33. If the reference undertaking is assumed to be an empty undertaking before the transfer takes place (cf. assumption 2), Article 77(5) can be interpreted in such a way that after the transfer all eligible own funds in this undertaking will be necessary to support the transferred obligations.
- 3.34. On the other hand, if it is assumed that the reference undertaking is non-empty, the interpretation of Article 77(5) will be more difficult, due to the fact that this undertaking will have eligible own funds and be subject to a capital requirement related to its existing business prior to the transfer. After the transfer the eligible own funds would exceed the amount being necessary to support the transferred obligations.

- 3.35. **Assumption 4:** After the transfer of insurance and reinsurance obligations, the reference undertaking has assets to cover the Best Estimate net of reinsurance and SPVs, the risk margin and the SCR. For the purposes of calculating the risk margin these assets should be considered to minimize the market risk of the undertaking. The reference undertaking should only be subject to market risk that is unavoidable in practice.
- 3.36. After the transfer the reference undertaking will have on its balance sheet both assets covering (re)insurance obligations (technical provisions) and assets covering capital.
- 3.37. In a transfer of (re)insurance obligations, a transfer of assets that cover those obligations will typically also take place. Therefore, immediately after the transfer, part of the assets of the reference undertaking would be formed of assets that originate from the original undertaking. As a result it is possible that there would be market risk linked to those assets.
- In this context, it can be assumed that the reference undertaking will de-risk these assets²³ in order to reduce the part of SCR related to market risk. For example, the reference undertaking can sell investments in equity or property to avoid the corresponding risks. It can sell corporate bonds and buy government bonds instead to avoid credit spread risk, or it can restructure the investments to achieve a better cash-flow or currency matching and thereby reduce interest rate and currency risk.
- 3.38. In principle, the time needed for this de-risking will depend on the selection of assets that are transferred from the original undertaking. For reasons of practicability it should be assumed that the de-risking takes place immediately after transfer.
- 3.39. On the other hand, Article 76 mentions the transfer of obligations and Article 77 refers to the amount of eligible own funds that would be needed to take over and meet these obligations. Neither of the two articles makes reference to any transferred assets. Therefore it could also be argued that the nature of assets held in the reference undertaking is independent of those of the original undertaking. This would also be supported by the requirement that the assumptions made about the reference undertaking should be harmonised throughout the European Union and that undertaking-specific information should only be used where it better reflects the underlying portfolio characteristics. Hence, even according to this argument it is justified to assume that the reference undertaking covers the transferred obligations with assets that minimise the market risk.
- 3.40. In QIS4, CEIOPS proposed that market risk should not be taken into account in the calculation of the risk margin for reasons of practicability. In many cases this is justified as the assets can be completely de-risked. However, for particular kinds of insurance obligations not all market risk can be avoided. For example, if the insurance obligations have a very long duration, it may not be possible to match the cash-flows completely. The mismatch may give rise to a significant interest rate risk.

²³ In the present context an asset is considered as de-risked if there is no capital requirement linked to it.

- 3.41. Stakeholders noted that the QIS4 approach neglected the unavoidable market risk. For example, the CRO Forum gave in its paper "Market Value of Liabilities for Insurance Firms" the following examples of market risks which cannot be avoided in practice:²⁴
- (i) 60-year USD, EUR or Yen cash flow or interest rate option,
 - (ii) 15-year emerging markets cash flow,
 - (iii) 30-year equity option.
- 3.42. If market risk is excluded from the risk margin calculation also in cases where it cannot be eliminated in practice, the resulting technical provisions would be lower than the transfer value, because any undertaking taking over insurance obligations bearing unavoidable market risk would require a compensation for the risk bearing.
- 3.43. The unavoidable market risk can be determined by analysing the possibilities to reduce the SCR for market risk. For example, let $CF_1, CF_2, \dots, CF_{30}$ be the expected cash-flows of an insurance portfolio. Let it be possible in practice to match cash-flows up to 20 years with risk-free instruments but not above this threshold. The reference undertaking could match the cash-flows CF_1, \dots, CF_{20} and cover the cash-flows CF_{21}, \dots, CF_{30} with instruments of 20-year duration. In this way, the market risk would only consist of a residual interest rate risk. Alternatively, the reference undertaking could match the cash-flows CF_{21}, \dots, CF_{30} with corporate bonds or risk-free instruments of another currency (where risk-free instruments of longer duration are available). In these cases, the market risk would only consist of credit spread risk or currency risk. The investment portfolio with the lowest market risk SCR determines the SCR that needs to be allowed for in the risk margin.
- 3.44. A perfect replication of the liability cash flows is one that completely eliminates all risks (not only market risk) associated with the liability. In practise, perfect replication is expected to be relatively rare. It should therefore be noted that replication of cash-flows and elimination of market risk SCR are different concepts. It is not necessary to perfectly replicate the cash-flows of the obligations to eliminate the market risk SCR. It is sufficient to replicate the liability cash-flows on best estimate level to reduce the standard formula SCR to an immaterial level for the purposes of calculating the risk margin.
- 3.45. For non-life insurance obligations and short-term life insurance obligations the market risk SCR can usually be reduced to zero.
- 3.46. The Level 1 text defines the Cost-of-Capital rate as an additional rate above the risk-free interest rate that an undertaking would incur holding an amount of eligible own funds equal to the SCR. An underlying assumption there is that the assets that cover the SCR provide a return that equals the risk-free interest rate and therefore the cost of holding capital comprises only the additional rate above that. A consequence of

²⁴ CRO Forum: Market Value of Liabilities for Insurance Firms – Implementing Elements for Solvency II (July 2008).

this is that there may exist market risk or counterparty default risk linked to these assets.

The market risk or counterparty default risk linked to the assets that cover the SCR depends on the size of the SCR. While the size of the SCR in turn depends on the individual risk modules, there arises a circular definition of the SCR. In order to avoid this, it is assumed that the risk connected to the assets that cover the SCR is zero. This simplifying assumption leads to an understatement of the risk margin but it is useful for practicability reasons.

- 3.47. It is furthermore assumed that both the market risk and the counterparty default risk linked to the assets that cover the risk margin is zero. As the risk margin depends on the SCR and the SCR depends among other things on the risks linked to the assets that cover the risk margin, this would lead to a recursive calculation of the risk margin. However, this risk can be ignored for practicability and materiality reasons.
- 3.48. As with all other risks which are included in the risk margin calculation, the allowance for market risk should be done in a practicable and proportionate way with particular consideration of its materiality. For example, in QIS3 market risk was captured in the calculation by allowing for the current market risk SCR in the first year but not any of the following years of the SCR projection. CEIOPS will give advice on simplifications of the risk margin calculation at a later stage.
- 3.49. **Assumption 5:** The SCR of the reference undertaking consists of:
- (a) underwriting risk with respect to the transferred insurance and reinsurance obligations;
 - (b) counterparty default risk with respect to ceded reinsurance and SPVs;
 - (c) operational risk; and
 - (d) unavoidable market risk.
- 3.50. The reference undertaking is subject to underwriting risk corresponding to the transferred insurance and reinsurance obligations, and these risks exist throughout the lifetime of the obligations. On the other hand, underwriting risk related to new business is not included. With respect to the non-life underwriting risk, the (non-life) catastrophe risk should only include pre-claims obligations (i.e. claims related to catastrophe events incurring after the balance sheet day).
- 3.51. Moreover, it seems reasonable to take into account
- counterparty default risk related to risk mitigation contracts (e.g. reinsurance contracts) covering the transferred insurance and reinsurance obligations; and
 - operational risk related to transferred insurance and reinsurance obligations.

However, for reasons of practicability it is assumed that the reference undertaking does not carry any risk of default of counterparties to financial derivatives contracts.

- 3.52. **Assumption 6:** The loss absorbing capacity of technical provisions in the reference undertaking corresponds to those of the original undertaking.
- 3.53. It seems reasonable to assume that the profit sharing commitments of the original undertaking carry over to the reference undertaking as far as they are confined to the line of business. Hence, the risk mitigating effects of future profit sharing should be taken into account to the same extent as in the original undertaking.
- 3.54. **Assumption 7:** There is no loss absorbing capacity of deferred taxes related to the reference undertaking.
- 3.55. It follows immediately from the assumption that the reference undertaking is an empty undertaking that the loss absorbing capacity of deferred taxes should be excluded from the valuation of the risk margin.
- 3.56. **Assumption 8:** The insurance and reinsurance obligations of each line of business (as defined in Article 86(e)) are transferred to the empty reference undertaking in isolation. Hence, no diversification benefit between lines of business arises.

For the purpose of determining the risk margin, the SCR of the reference undertaking should be calculated (using a standard formula or internal model) at least by line of business, based on the segmentation laid down by the implementing measures referred to in Article 86(e).

If the SCR of the original undertaking is calculated by using an internal model, the segmentation may differ from the one laid down by the implementing measures referred to in Article 86(e). However, the risk margin shall always be valued at least at the level of lines of business laid down by those implementing measures.

- 3.57. The approach referred to in assumption 8 is reasonable since it is required according to Article 86(e) of the Level 1 text (cf. also Article 80) to calculate this margin (at least) by the individual lines of business.²⁵ Especially, there will be no ambiguity involved in the allocation of the risk margin as long as this approach is applied.
- 3.58. The requirement that the (re)insurance obligations of the individual lines of business are transferred in isolation can make the risk margin calculations somewhat more complex (or may at least increase the number of calculations), since it requires the SCR to be calculated by line of business. However, CEIOPS does not believe that the calculation of the SCR by line of business poses a significant practical problem particularly since the main contribution to the risk margin calculation stems from the SCR for underwriting risk where the relevant input is available by line of business. Furthermore, as mentioned above simplifications will be introduced in order to make these calculations more feasible.
- 3.59. If instead an approach starting from the risk margin calculations for the overall portfolio – taking into account all possible diversification effects

²⁵ Article 86(e) stipulates the segmentation of (re)insurance obligations into lines of business for the calculation of technical provisions. In this context, no distinction is made between the best estimate and the risk margin (per line of business).

(related to the SCR-calculation) – would be applied, several complicating aspects would be introduced, including the following:

- It is not obvious how the overall risk margin should be distributed among the individual lines of business. (E.g. the earned premiums will not be a suitable set of weights for the calculations to be carried out in this context. Nor will the best estimate technical provisions (in non-life insurance) do, cf. the percentages used in the risk margin proxy proposed for QIS4 purposes.)
- If only a part of the (re)insurance obligations (e.g. the obligations related to a single line of business) are transferred from the original undertaking to the reference undertaking, this will require a recalculation of risk margins – both for the portfolio of obligations that are being transferred and for the portfolio of obligations remaining in the original undertaking – and the sum of these risk margins will be higher than the risk margin originally calculated for the overall portfolio (taking into account all diversification effects). In general, this would mean that after the transfer has been carried out, the risk margin related to the (re)insurance obligations that remain in the original undertaking must be increased.

3.60. A more detailed assessment of the merits of alternative approaches to the treatment of diversification effects in the context of risk margin calculations is given in subsection B below.

3.61. Since the risk margin depends on the present and future SCRs as calculated per line of business and the margin – in the same manner as the best estimate – in any case shall be calculated per line of business, a natural solution would be to use the same segmentation for the calculation of best estimate technical provisions, risk margins and the SCR, respectively.

3.62. Especially, there seems to be no reason for a (re)insurance undertaking using the standard formula for the SCR-calculations to apply a more granular segmentation than the one that follows from the implementing measures regarding Article 85(e) as this in general will increase the overall risk margin. Moreover, a finer segmentation will lead to laborious recalculations of the (standard) SCR (e.g. per homogenous risk groups) and this may also raise some issues related to the reliability of the (input) data for these calculations.

3.63. The requirement that the risk margin should be valued at least at the level of lines of business also in cases where the SCR of the reference undertaking is calculated by an internal model is introduced in order to ensure that all reference undertakings apply the same granularity with respect to these calculations, i.e. in order to avoid ambiguities in the assessing of the relevant technical provisions when a portfolio of (re)insurance obligations is transferred between two undertakings. Moreover, this requirement should be seen as a measure to achieve harmonisation of the (calculated) technical provisions between undertakings, including improved comparability etc. (see also assumption 9 hereunder).

- 3.64. **Assumption 9:** The internal model of the original undertaking (partial or full) can be used to measure the SCR of the reference undertaking to the extent that these models cover at least the risks referred to in assumption 5 as defined by the standard formula.
- 3.65. When Article 77(5) of the Level 1 text refers to the “amount of eligible own funds equal to the Solvency Capital Requirement necessary to support the insurance and reinsurance obligations” it does not distinguish between SCR calculations based on the standard model and internal models, respectively. Hence it may be argued that the SCR-calculations to be applied in the Cost-of-Capital assessment can be based on either the standard model or internal models.
- 3.66. An argument in favour of applying SCR calculations based on internal models when determining the risk margin, may be that these models are designed in order to capture the risk of the portfolio in question (i.e. the portfolio of the original undertaking) in a better way. However, if an internal model portrays levels of risks that are specific for the original undertaking but cannot be assumed to be similar for the reference undertaking, this may be an argument for not relying on internal model calculations when determining the risk margin. Hence, some conditions should be in place with respect to using SCR-results from internal models in the risk margin calculations.
- 3.67. In general an internal model is approved for the calculation of the current SCR, while the determination of the risk margin requires the calculation of all future SCRs as well. However, an approved internal model may not be fully adequate for the latter calculations.
- 3.68. **Assumption 10:** The Cost-of-Capital risk margin is defined net of reinsurance and SPVs.
- 3.69. This assumption is consistent with assumption 5 regarding the SCR calculations to be carried out for the reference undertaking and especially the calculation of the partial SCR for underwriting risk as this partial SCR is only calculated net of reinsurance and SPVs.
- 3.70. A requirement to calculate the risk margin also gross of reinsurance would imply a doubling of the number of calculations regarding future SCRs for underwriting risk and these gross calculations would be relevant only for the determination of the risk margin.
- 3.71. Moreover, a likely consequence of calculating the risk margin both gross and net of reinsurance could be that a (positive) risk margin is attached also to the reinsurance assets (the reinsurance recoverables), when these results are presented in the financial statement (of the original undertaking). However, this would probably not be in line with the accounting standards for insurance contracts, see e.g. the relevant provisions in IFRS4 regarding valuation of reinsurance assets.²⁶

²⁶ A discussion of this issue is beyond the scope of the present paper.

B. An assessment of other approaches regarding the reference undertaking and the treatment of diversification effects

- 3.72. The proposed assumption 8 to be fulfilled by the reference undertaking (cf. para. 3.56) covers both the segmentation to be used in the risk margin calculations and the treatment of diversification effects (caused by correlations).
- 3.73. It should be noted that the treatment of diversification effects in the risk margin calculations and the requirement to calculate a risk margin for the individual lines of business are two separate issues – even if they apparently coincide in the approach proposed by CEIOPS. However, if the approach starting from the overall portfolio (at undertaking or group level) is chosen, this distinction becomes clearer. Although diversification effects between lines of business (and possibly between undertakings within a group) are taken into account, this does not preclude the calculation of risk margins for the individual lines of business. What it implies is that these calculations will become more challenging to perform.
- 3.74. The potential impact of assumption 8 should be viewed in light of the other assumptions defining the reference undertaking (per se), i.e. especially assumptions 1 and 2.²⁷
- 3.75. The CEA and CRO Forum have both provided input on the assumptions underlying the calculation of the risk margin. CEIOPS appreciates the contributions of both the CEA and the CRO Forum in this area. However, after careful analysis, CEIOPS' position nevertheless differs from those of the CEA and CRO Forum particularly with regard to the framing of assumption 8. A comparison of the positions taken by CEA, CRO Forum and CEIOPS regarding the above-mentioned aspects of the reference undertaking are summarised in table 1.

Table 1. A comparison of approaches regarding the reference undertaking (RU).

Assumptions regarding the RU	CEA	CRO Forum	CEIOPS
Assumption 1	Mirror of original undertaking (?)	Another undertaking	Another undertaking
Assumption 2	Non-empty	Non-empty mirror of original undertaking	Empty
Assumption 8: <ul style="list-style-type: none"> • Allowance for diversification • Calculation of risk margins per line of business 	At least up to the level of the undertaking Does not believe these calculations are required	Up to the group level No response to date	Up to the lines of business These calculations should be carried out

²⁷ Assumptions 3-7, 9 and 10 are concerned more with the calculation of the future SCRs for the reference undertaking.

Assumptions 1 and 2

- 3.76. CEIOPS understands CEA's position with respect to assumption 1 and 2 to be that the reference undertaking should be a "mirror" of the original undertaking and as such a non-empty undertaking (before a transfer takes place). This position is described as follows in a recent paper:²⁸

Firstly, a transfer of business is only one possible outcome in case an insurer runs into difficulty. The disposal of individual portfolios is rare and instead a very likely scenario would be that the insurer was closed to new business and then the existing business was run-off. [...] Therefore, it is important to refer to business being retained and 'own entity' assumptions being used, rather than artificial 3rd party 'hypothetical' assumptions. [...]

Secondly, [...] the CEIOPS methodology seems to be based on the assumption that the business would be transferred to an empty shell company. This is not a plausible assumption and not in line with past practice.

- 3.77. This is in line with previous statements from CEA, e.g. in their position paper on the Cost-of-Capital methodology, where CEIOPS' background document on the reference undertaking was commented upon as follows:²⁹

However, a number of different assumptions could be made in respect of the reference entity, e.g. that the entire portfolio is transferred to a single, empty reference entity, a well diversified non-empty entity, etc. [...]

As such rather than advocating a particular approach it is more appropriate to specify what attributes/features the CEA should require of a market value risk margin approach.

- 3.78. However, CEIOPS does not believe that this approach can be considered to be in line with the provisions of the Level 1 text where it is referred explicitly to an immediate transfer of obligations to another (re)insurance undertaking or the statements in the recitals regarding the reference undertaking as well as the limitations regarding the use of undertaking-specific information.

- 3.79. In its proposal for general principles regarding the calculation of the market value of liabilities, the CRO Forum asserts that³⁰

Entity-specific assumptions should be made when projecting future cash flows so that the valuation reflects the particular characteristics of the portfolio in question. [...]

²⁸ CEA paper on the allowance for diversification within the market value risk margin (4 March 2009), http://www.cea.eu/index.php?mact=DocumentsLibrary,cntnt01_details,0&cntnt01documentid=617&cntnt01returnid=100.

²⁹ CEA: Cost of capital methodology (30 May 2008), http://www.cea.eu/index.php?mact=DocumentsLibrary,cntnt01_details,0&cntnt01documentid=519&cntnt01returnid=100

³⁰ CRO Forum: Market Value of Liabilities for Insurance Firms – Implementing Elements for Solvency II (July 2008), <http://www.croforum.org/publications.ecp> (hereafter CRO Forum Report).

Therefore, the CRO Forum believes it to be more economically sound to value insurance liabilities on the basis that they are kept in the company's own portfolio [...] rather than to base the valuation on a hypothetical transfer.

And moreover,

We note that the draft directive wording utilises the 'transfer' concept as the basis of valuation of technical provisions and subsequently defines how the calculation should be carried out. We believe that our approach is equally consistent with this basis when it is assumed that the whole entity is being transferred into an empty reference company. Both approaches can lead to similar conclusions when determining market consistent value for insurance liabilities.

- 3.80. CEIOPS notes that the basis underlying the CRO Forum's approach (liabilities are kept in the undertaking's own portfolio) is not consistent with the Level 1 text but that the CRO Forum nevertheless believes that this position can be reconciled with the Level 1 text by assuming that the overall portfolio is transferred to an empty reference undertaking. CEIOPS has reservations with regard to this interpretation as this does not allow transfer of the insurance obligations by line of business.

Assumption 8 – Allowance for diversification

- 3.81. CEA's paper from March 2009 referred to above also confirms CEA's previous position that the risk margin should be calculated at the level of the undertaking allowing for all diversification effects. In this context it is stated (with a reference to Article 74(1)) that the valuation process under Solvency II is based on "the overlying principle of the recognition of diversification" and that (parts of) CEIOPS' position is not in line with the Level 1 text. Beyond this, the CEA's arguments in favour of the allowance for diversification effects rest implicitly on their position regarding assumptions 1 and 2 referred to above and their belief that the allocation of the overall risk margin among the individual lines of business is not required:

The CEA's position is based on the overarching requirement that the Framework Directive requires an accurate calculation of the current transfer value. Given that the receiving company will invariably already hold existing business, it is appropriate to reflect diversification effects as these will in practice be taken into account when transfer prices are determined.³¹

- 3.82. According to the CRO Forum the projection of the SCRs in respect of non-hedgeable risks should be carried out allowing for diversification benefits between non-hedgeable risks up to the group level. Moreover, it should be assumed that the insurer's risk profile evolves according to realistic best estimate assumptions, meaning that the capital necessary to support non-hedgeable risk in future years will depend on future new business written.

³¹ Cf. CEA's comment on the draft advice regarding the calculation of the risk margin.

- 3.83. CEIOPS does not consider the reference made to future new business to be in line with the Level 1 text, cf. the wording of Article 76(2) and Article 77(5).
- 3.84. Moreover, according to recital 55 of the Level 1 text "*the value of technical provisions should correspond to the amount another insurance or re-insurance undertaking (reference undertaking) would be expected to require to take over and meet the underlying insurance and reinsurance obligations*". The Level 1 text does not give any justification for a treatment where the value of the technical provisions would fulfil this requirement only if it is valued on the level of an insurance group. On the contrary, the valuation principle should apply to any portfolio of insurance and reinsurance obligations.
- 3.85. This also applies to CEA's position that the risk margin should be calculated at the undertaking level only. Taking into account diversification at the level of the undertaking would undermine partial transfers, i.e. transfers of less than the overall portfolio.
- 3.86. In this context it should be noted that although the transfer concept can be seen as a theoretical framework, it also has an important practical bearing from the point of view of the supervision of insurance undertakings. Transfers of insurance portfolios are relatively common in the insurance sector, including both full and partial transfers. Portfolio transfers are also a particularly important supervisory tool as regards policyholder protection when an undertaking becomes or is in danger of becoming insolvent.
- 3.87. From a supervisory point of view there are also obvious merits if the same segment of insurance obligations results in the same value of technical provisions regardless of the whereabouts of those obligations. This would ensure that the value is objective and not affected by undertaking-specific information, cf. recital 55 which states that "*undertaking-specific information should [...] only be used in the calculation of technical provisions insofar as that information enables undertakings to better reflect the characteristic of the underlying insurance portfolio*".

Assumption 8 – Calculation of risk margins per line of business

- 3.88. Finally, with respect to the issues regarding the calculation of risk margins for the individual lines of business, the feedback from CEA has been limited to the following:³²

[...] there may be practical issues with attempting to calculate isolated line of business figures. [...] This is particularly likely to be the case under the stress circumstances reflected in the SCR which is then used to compute the market value risk margin. [...]

[...] we believe there is little to be gained from allocating the market value risk margin across different lines of business and we do not believe it should be a regulatory requirement to do so. The split of the risk margin would also necessarily involve an element of subjectivity,

³² CEA paper on the allowance for diversification within the market value risk margin (4 March 2009).

as diversification effects would need to be allocated per line of business. [...]

However [...] for internal management purposes, some companies may wish to allocate the market value risk margin by line of business, [...] Companies should be allowed to do this by whichever method they believe is most suitable. However, as stated above, they should not be compelled to do so for regulatory solvency purposes.

- 3.89. CEIOPS does not agree with the CEA's position that a calculation of risk margins for the individual lines of business is not required. This is based on the rationale for assumption 8 (cf. para. 3.57-3.59 above), which refers to the problems an undertaking (or group) will face, if the risk margin calculations start from the overall portfolio – taking into account all possible diversification effects.
- 3.90. The issues related to the calculation of risk margins per lines of business are not covered in the CRO Forum's paper.

3.1.3.2 The Cost-of-Capital rate

3.1.3.2.1 A general approach for stipulating the Cost-of-Capital rate

- 3.91. According to Article 77(5) of the Level 1 text the Cost-of-Capital rate "shall be the same for all insurance and reinsurance undertakings and shall be reviewed periodically". Moreover, the Cost-of-Capital rate used

shall be equal to the additional rate, above the relevant risk-free interest rate, that an insurance or reinsurance undertaking would incur holding an amount of eligible own funds, [...], equal to the Solvency Capital Requirement necessary to support the insurance and reinsurance obligation [...].

- 3.92. As the "additional rate, above the relevant risk-free interest rate" referred to in Article 77(5) shall be the same for all insurance and reinsurance undertakings, it should be calibrated in a manner that is consistent with the assumptions made for the reference undertaking. In practise this means that the Cost-of-Capital rate should be consistent with the Value-at-Risk-assumption corresponding to a confidence level of 99.5 per cent over the stipulated one-year time horizon as laid down for the calculation of the Solvency Capital Requirement (SCR). Especially, the Cost-of-Capital rate should be independent of the actual solvency position of the original undertaking.
- 3.93. In the third and fourth Quantitative Impact Study for Solvency II (QIS3 and QIS4) the Cost-of-Capital rate had been fixed at 6 per cent as such a rate has been assumed to reflect the cost of holding an amount of eligible own funds for an insurance or reinsurance undertaking being capitalised corresponding to a confidence level of 99.5 per cent Value-at-Risk over a one year time horizon.
- 3.94. The required consistency between the stipulated Cost-of-Capital rate and the (Value-at-Risk) assumptions for the SCR-calculations was explained as follows: the 6 per cent Cost-of-Capital rate corresponds to the cost of

providing eligible own funds for BBB-rated insurance or reinsurance undertakings, cf. the Cost-of-Capital rate used by the Swiss regulator in its Solvency Test for BBB-rated reference undertakings.

- 3.95. As part of the QIS4-feedback, questions have been raised regarding the appropriateness of the assumed Cost-of-Capital rate of 6 per cent. Especially, reference was made to the work carried out by the Chief Risk Officer Forum (CRO Forum), and a substantially lower Cost-of-Capital rate has been indicated (cf. also section 3.1.2.2 above).
- 3.96. However, a critical analysis of the CRO Forum's report³³ – as well as other reports on this issue³⁴ – does not support the QIS4-feedback referred to above. On the contrary, the analysis which is summarised in the subsection below, indicates that an assumed Cost-of-Capital of 6 per cent or higher could be seen as appropriate – given the information currently available regarding this issue. In this context it should be noted that although the CRO Forum has indicated in its report that its research suggests a Cost-of-Capital rate in the range of 2 ½ - 4 ½ per cent, it also acknowledges that its research did not prove conclusive. Moreover, it seems that the CRO Forum first and foremost has focussed on results leading to the lowest estimates of the Cost-of-Capital rate.
- 3.97. The analysis summarised in the following subsection does not discuss the required periodical review as referred to in Article 76(5) of the Level 1 text. However, CEIOPS points out that the frequency and procedures to be followed for this review would need to be developed. A possible approach could be to test the appropriateness of the Cost-of-Capital rate every five years. In this context, it should be stressed that due to the long-term nature of the Cost-of-Capital rate, this does not necessarily mean that the rate has to be changed as a consequence of a periodic review.

3.1.3.2.2 Assessment of the Cost-of-Capital Rate

(a) Introductory remarks

- 3.98. The Cost-of-Capital rate is an annual rate applied to a capital requirement in each period. Because the assets covering the capital requirement themselves are assumed to be held in marketable securities, this rate does not account for the total return but merely for the spread over and above the risk free rate.
- 3.99. The risk margin shall guarantee that sufficient technical provisions for a transfer are available even in a stressed scenario. Hence, the Cost-of-Capital rate has to be a long-term average rate, reflecting both periods of stability and periods of stress. Otherwise, the rate would vary from year to year, and would be higher in times of economic uncertainty (when providers of capital would be expected to seek greater returns for the

³³ CRO Forum: Market Value of Liabilities for Insurance Firms – Implementing Elements for Solvency II (July 2008).

³⁴ GNAIE (Group of North American Insurance Enterprises): Market Value Margins for Insurance Liabilities in Financial Reporting and Solvency Applications (October 2007), <http://www.insuranceaccounting.org/images/Market%20Value%20Margin10CA985.pdf>

comparatively higher risk) and would therefore contribute to higher technical provisions than in more stable economic situations.

3.100. A rate of at least 6 per cent is assessed to be an adequate placeholder for the Cost-of-Capital rate in the current context of the Solvency II regulation. In order to reach this conclusion it may be argued along the following lines:

- Shareholder return models provide the initial input.
- Some objective criteria may cause upward and downward adjustments of the initial input.
- A final calibration of the Cost-of-Capital rate, in order to obtain risk margins consistent with observable prices in the marketplace, may be necessary.

Before discussing this three-step procedure, this advice will reflect on the assumptions that would be reasonable to make regarding the funding of the capital requirement.

(b) Funding of the capital requirement

3.101. In CRO Forum's report, the Cost-of-Capital rate is calculated as a weighted average of the cost of equity and the cost of debt. It is assumed that 20 per cent of the capital requirement can be funded by issuing debt and that only the remaining 80 per cent have to be funded by raising equity capital. Moreover, by assuming an effective company rate of taxation of 35 per cent over all jurisdictions, the estimated cost of debt is in practise outweighed by the adjustments for tax relief on interest payments made to service the debt. As a result the Cost-of-Capital rate equals only approximately 80 per cent of the estimated cost of equity rate.

3.102. It should be noted that the assumed funding based on 80 per cent equity and 20 per cent debt cannot be justified in light of the feedback received during the QIS4-exercise. According to the QIS4-report the participating undertakings reported that 95 per cent of their own funds are classified as tier 1 capital of which only 2 per cent are classified as "subordinated loans" and only 4 per cent as "other reserves (with restricted loss absorbency)". Moreover, only 50 per cent of the tier 2 and tier 3 capital are classified as subordinated loans or other hybrid capital.³⁵ Consequently, the QIS4-results indicate clearly that the assumed debt-funding in any case cannot constitute more than 6-8 per cent of the capital base.³⁶

3.103. Moreover, it may be referred to the high-level political guidance to increase the quality of the external funding (subordinated loans, hybrid capital instruments etc.) of financial institutions. It follows from this that subordinated loans and hybrid capital should have a high loss-absorbing capacity rather similar to "core" capital, cf. the revision carried out in the banking sector. Accordingly, it seems reasonable to expect the cost-

³⁵ Cf. CEIOPS' Report on its fourth Quantitative Impact Study (QIS4) for Solvency II, page 129-132.

³⁶ In the remainder of the present sub-section it is referred to "the capital base" and not "the eligible own funds" since the first concept is closest to the terminology used in CRO Forum's report.

differences between equity funding and allowed external funding to diminish.

3.104. In this context it should also be stressed that since the capital base is defined as the solvency capital requirement in an adverse situation, i.e. as the amount of capital that is substantially at risk, it would be inconsistent to assume at the same time that this requirement can be funded by debt investors at costs substantially below equity.

3.105. With respect to the assumed impact of taxation (i.e. the tax relief on interest payments) on the assessment of the Cost-of-Capital rate, this aspect will be less important than assumed in CRO Forum's report due to the QIS4-feedback referred to in paragraph 3.102 above.³⁷ However, it still remains to decide on the tax rate(s) to be used if a more detailed analysis of this aspect of the Cost-of-Capital calculations should be carried out.³⁸

3.106. Based on the considerations given in the previous paragraphs CEIOPS finds that an approach based on the market situation (i.e. the actual combination of equity and debt funding) leads to conclusions similar to the approach used up to now (i.e. 100 per cent equity funding), in particular for the purposes of the assessments summarised in subsection (c) below.

(c) The three-step procedure for assessing the Cost-of-Capital rate

(c1) Shareholder return models

3.107. The research carried out by both CRO Forum and GNAIE has been analysed. As the most commonly used models in the market seem to be the Capital Asset Pricing Model (CAPM) and versions of the Fama-French multi Factor Model (FFmF), CEIOPS' analysis has been confined to the results given for these models.

- *The Frictional Cost-of-Capital approach*

3.108. In CRO Forum's research the rate of return above the risk free rate that shareholders of insurance undertakings demand in order to assume broadly diversified insurance risks, are estimated using different methods and assumptions. CRO Forum deems that the so-called Frictional Cost of Capital approach is the most appropriate to capture the rate of return an insurance company requires on the capital it deploys to support non-hedgeable risk over a given year. This is likely the reason why they rely so heavily on the results from this method when drawing their conclusions.

³⁷ A rather peculiar – and likely unintended – implication of the assumptions made in CRO Forum's report should be mentioned. Since the estimated cost of debt is outweighed by the tax-relief on interest payments made to serve this debt, a logical conclusion seems to be that by increasing the (relative) debt-funding an insurance undertaking will be rewarded by a lower Cost-of-Capital rate. According to CEIOPS' understanding this cannot be in line with the intention of Article 76(5) of the Level 1 text.

³⁸ It may also be questionable whether an insurance undertaking being in a stressed situation will be in a position to benefit from further tax credits.

3.109. However, CEIOPS has reservations regarding the results based on this approach³⁹ as reproduced in the CRO Forum' report. Firstly, the results of the method are very dependent on a number of key assumptions – effective tax rate, loss carry forward period and risk free rate – for which it is difficult to assess reasonable parameter estimates in an EU context. Secondly, of the main components of the frictional costs – double taxation costs, financial distress costs⁴⁰ and agency costs⁴¹ – only the two first have been modelled.

3.110. Moreover, the CRO Forum has drawn e.g. the following conclusions after having modelled double taxation and financial distress costs:⁴²

For highly capitalized companies, the cost of capital rate is determined mainly by the cost of double taxation and the cost of financial distress is negligible. [...]

The cost of capital rate depends linearly on a jurisdiction's tax rate for all confidence levels. This means that the cost of capital rate (and therefore the MVM) in a jurisdiction with a tax rate of 10% is only half of that in a jurisdiction with a tax rate of 20%.

In CEIOPS' opinion the result implied by these conclusions does not seem reasonable for Member States in which the effective tax rate is low. Furthermore, CEIOPS also questions the assertion that financial distress costs are negligible for well capitalized companies.

- *The CAPM and the FF2F-method*

3.111. In CRO Forum's research related to the CAPM and the FF2F method, the cost of equity rate above the risk-free rate has been estimated for three markets: the European, the Asian and the US market. From these estimated rates a "Global World" rate has been derived for both methods. The Global World rates are in general lower than the European rates, cf. table 2 below.⁴³ When concluding on an appropriate level of the Cost-of-Capital rate, CRO Forum has taken into account only the lower Global World rates without giving any explicit rationale for this choice.

3.112. CEIOPS finds it more appropriate to base the assessment of the Cost-of-Capital rate on CRO Forum's results for the CAPM and the FF2F method for European insurance undertakings. In this context it may also be noted that the FF2F-results for the European non-life insurers are in line with the results referred to in GNAIE's report for US non-life insurers (an equity risk premium of 14.2 per cent).

³⁹ Under this approach, the total return required by shareholders may be thought of consisting of the base cost of capital, the frictional costs and the expected economic profit. Only the frictional costs are taken into account in determining the Cost of Capital rate.

⁴⁰ These are direct and indirect costs which arise when an insurer has difficulties meeting its financial obligations to policyholders or debt holders.

⁴¹ Agency costs are associated with the misalignment of the interest between management and shareholders or between policyholders and shareholders. The lack of transparency and informational asymmetry are also deemed to be part of agency costs.

⁴² Cf. CRO Forum's report, page 36.

⁴³ In the CAPM-case the reported Global rates are lower than the reported rates for all three markets – a result that could have been better explained in the report.

Table 2. Equity Risk Premiums as assessed in the CRO Forum's report.⁴⁴

	CAPM		FF2F	
	European market	Global market	European market	Global market
Life	10.0 pct	5.1 pct	11.8 pct	9.4 pct
Non-life	7.4 pct	4.2 pct	12.5 pct	9.6 pct

3.113. Taking into account only the results from the shareholder return models a Cost-of-Capital rate of 7 ½-10 per cent seems to be adequate. It should, however, be noticed that the figures reproduced in table 2 are based on historical averages during normal times only and do not take into account stressed scenarios in an adequate manner.

(c2) Adjustment of shareholder return

3.114. To the output from the shareholder return models both upward and downward adjustments are needed when assessing the cost of capital rate in a solvency context.

3.115. Downward adjustments: In order to account for the fact that a key source of return that exists for going concerns (the so called franchise value related to expected profit from new business) may not be demanded by capital providers in a transfer context, a downward adjustment is needed. No reliable quantitative results are available concerning the size of this adjustment.

3.116. Upward adjustments: Additional costs, i.e. costs beyond those required to compensate investors for the risk they are assuming, make an upward adjustment necessary. These additional costs may stem from:

- Frictional costs of carrying capital. These are additional costs⁴⁵ which reflect a variety of indirect costs, as frictional costs related to managers' incentives, information asymmetries, and so on. Again, these costs are very difficult, if not impossible, to quantify.
- Initial costs of raising capital. These are fees for underwriting, listing and regulation, which in most jurisdictions are not negligible⁴⁶.
- Corporate income taxes on the risk margin in some tax jurisdictions. This is the case if the risk margin is considered as taxable profit at inception and not as taxable income only over the time of its release from the risk margin.

3.117. As already indicated, the aggregate effect of both upward and downward adjustments is difficult to quantify in a reliable manner. However, as it is

⁴⁴ Cf. CRO Forum's report, page 58, 60 and 61.

⁴⁵ Cf. the GNAIE-report, page 30.

⁴⁶ Underwriting fees, which generally constitute at least half of the direct IPO costs, amount to about 3.5% of the raised equity in the UK, Germany or France, and to more than 6.5% in the USA. Source: Oxera report (2006), "The Cost of Capital: An International Comparison". Available at www.oxera.com.

unlikely that the downward adjustment outweighs the upward adjustments by a large margin, a range for the Cost-of-Capital rate after these adjustments of 6-8 per cent could be deemed as reasonable given the current market situation/information.

(c3) Calibration to market prices

3.118. The output for the cost of capital rate has to be calibrated further to give final risk margins consistent with observable prices in the marketplace. The risk margin together with the best estimate shall be "equivalent to the amount insurance and reinsurance undertakings would be expected to require in order to take over and meet the insurance and reinsurance obligations" (Article 76(3)).

3.119. In the Solvency II context an allowance may be necessary for the methodologies applied when calculating the capital base (i.e. the future SCRs). This is especially the case for any simplifying methods allowed.⁴⁷ All other assumptions equal, especially for unchanged best estimate, it may be argued that the cost of capital rate should be set higher if methods used in the solvency context give systematically lower capital bases than the capital bases assessed through the markets in real insurance portfolio transfers. Otherwise the technical provisions will be insufficient.

3.120. As long as the method used in assessing the capital base does not systematically underestimate the needed amount, a Cost-of-Capital rate of 6 per cent could be seen as adequate. In order to avoid procyclical effects, the Cost-of-Capital rate should not be adjusted to follow market cycles.

3.1.3.3 Calculation of the risk margin

The general approach

3.121. Based on the assumptions laid down for the reference undertaking and the assessment regarding the Cost-of-Capital rate referred to in sections above, a general approach for the risk margin calculations according to the Cost-of-Capital methodology can be summarised as shown in paragraphs below.

3.122. It follows from assumption 8 regarding the reference undertaking that the risk margin should be calculated per line of business and that no diversification effects should be taken into account. This means that

$$CoCM = \sum_{lob} CoCM_{lob}$$

where

$CoCM$ = the overall risk margin for the portfolio; and

$CoCM_{lob}$ = the risk margin for an individual line of business (*lob*).⁴⁸

⁴⁷ In QIS4 a majority of undertakings (independently of their size) used simplifications when making SCR-projections for the risk margin calculations.

⁴⁸ For the purpose of the present subsection, 'a line of business' may refer to either a line of business or a homogenous risk group according to CEIOPS' advice on segmentation, cf. para 3.134.

3.123. According to assumption 2 and 3 laid down for the reference undertaking, this undertaking is empty before a transfer of (re)insurance obligations takes place, whereas it after the transfer has eligible own funds corresponding exactly to the SCR that is necessary to support the transferred (re)insurance obligations. This means that the reference undertaking at time $t = 0$ (when the transfer takes place) will capitalise itself to the required level of eligible own funds, i.e.

$$EOF_{RU}(0) = \sum_{lob} SCR_{RU,lob}(0),$$

where

$EOF_{RU}(0)$ = the eligible own funds raised by the reference undertaking at time $t = 0$ (when the transfer takes place); and

$SCR_{RU,lob}(0)$ = the SCR for a given line of business (*lob*) at time $t = 0$ as calculated for the reference undertaking.

The cost of providing this amount of eligible own funds equals the Cost-of-Capital rate times the amount.

3.124. An assessment as sketched in the previous paragraph applies to the eligible own funds that the reference undertaking needs to provide in all future years, in order "to support the insurance and reinsurance obligations over the lifetime thereof" (Article 76(5)).

3.125. As the transfer of (re)insurance obligations is assumed to take place immediately (cf. Article 76(3)), the method for calculating the overall risk margin can in general terms be expressed in the following manner:

$$\begin{aligned} CoCM &= CoC \cdot \sum_{t \geq 0} EOF_{RU}(t) / (1+r_{t+1})^{t+1} = CoC \cdot \sum_{t \geq 0} \sum_{lob} SCR_{RU,lob}(t) / (1+r_{t+1})^{t+1} \\ &= \sum_{lob} \{ CoC \cdot \sum_{t \geq 0} SCR_{RU,lob}(t) / (1+r_{t+1})^{t+1} \} = \sum_{lob} CoCM_{lob} \end{aligned}$$

where

$SCR_{RU,lob}(t)$ = the SCR for a given line of business (*lob*) for year t as calculated for the reference undertaking,

r_t = the risk-free rate for maturity t ; and

CoC = the Cost-of-Capital rate.

3.126. The Cost-of-Capital rate "shall be the same for all insurance and reinsurance undertakings" (Article 76(5)). According to CEIOPS' view this rate should be fixed to 6 per cent (or higher), cf. the assessment made in the previous sub-section. However, a reservation should be made with respect to the outcome of the periodic reviews to be carried out.

3.127. The general rules for calculating the risk margin as laid down in the previous paragraphs should apply to all undertakings irrespective of whether the calculation of the SCR of the (original) undertaking is based on the standard formula or an internal model.

Calculations based on the standard formula

3.128. If the SCR of the (original) undertaking is calculated using the standard formula, all SCRs (for $t \geq 0$) for a given line of business should be calculated as follows:

$$SCR_{RU,lob}(t) = BSCR_{RU,lob}(t) + SCR_{RU,lob,op}(t) - Adj_{RU,lob}(t),$$

where

$BSCR_{RU,lob}(t)$ = the Basic SCR for the given line of business (*lob*) and year t as calculated for the reference undertaking,

$SCR_{RU,lob,op}(t)$ = the partial SCR regarding operational risk for the given line of business (*lob*) and year t as calculated for the reference undertaking; and

$Adj_{RU,lob}(t)$ = the adjustment for the loss absorbing capacity of technical provisions for the given line of business (*lob*) and year t as calculated for the reference undertaking.

3.129. It should be ensured that the assumptions made regarding loss absorbing capacity of technical provisions that need to be taken into account in the SCR-calculations per line of business, are consistent with the assumptions made for the overall portfolio (of the original undertaking).

3.130. The Basic SCRs for a given line of business (i.e. $BSCR_{RU,lob}(t)$ for all $t \geq 0$) should be calculated by using the relevant SCR-modules and sub-modules per line of business (meaning that the input to be used in the relevant modules should be restricted to the line of business in question).

3.131. Moreover, the calculation of the Basic SCRs (as referred to in para. 3.128) should be based on the correlation assumptions laid down in Annex IV of the Level 1 text although only the unavoidable market risk and the counterparty default risk with respect to ceded reinsurance is taken into consideration.

3.132. It should be noted that to the extent that market risk can be considered avoidable for a line of business (either from the very beginning (i.e. from $t = 0$) or after some years (i.e. from $t \geq t^*$)), the calculation of the Basic SCR would be simplified. Further simplifications may arise if the underwriting risk of a given line of business is confined to only one of the three modules for this risk.

The risk margin for lines of business within non-life insurance

3.133. With respect to the lines of business within non-life insurance the risk margin (as calculated per line of business) should be attached to the overall best estimate, that is with no split between risk margins for premiums provisions and for provisions for claims outstanding.

The overall risk margin

3.134. Furthermore, the overall risk margin of the undertaking shall result as the sum of risk margins as calculated for each line of business or each homogeneous group of risks, according to the segmentation that follows from CEIOPS' advice on segmentation (CEIOPS-DOC-22/09 mentioned previously). However, this does not preclude other treatments for other purposes.

Simplifications

3.135. General issues regarding simplifications for the risk margin calculations, including principles and criteria for using such simplifications, are addressed in CEIOPS' advice on Article 86(h) (see CEIOPS-CP-76-09 mentioned previously). Specific simplifications will be consulted upon in the third set of advice.

3.2 CEIOPS' advice

The reference undertaking

3.136. The reference undertaking assumed to take over and meet the insurance and reinsurance obligations of an insurance or reinsurance undertaking shall fulfil the following assumptions:

1. The reference undertaking is not the undertaking itself (the original undertaking), but another undertaking.
2. The reference undertaking is an empty undertaking in the sense that it does not have any insurance or reinsurance obligations and any own funds before the transfer takes place.
3. After the transfer the reference undertaking has eligible own funds corresponding exactly to the amount of SCR that is necessary to support the transferred obligations.
4. After transfer of the insurance obligations, the reference undertaking has assets to cover the Best Estimate net of reinsurance and SPVs, the Risk Margin and the SCR. For the purposes of calculating the risk margin these assets should be considered to minimize the market risk of the undertaking. The reference undertaking should only be subject to market risk that is unavoidable in practice.
5. SCR of the reference undertaking consists of
 - (a) underwriting risk with respect to the existing business,
 - (b) counterparty default risk with respect to ceded reinsurance and SPVs,
 - (c) operational risk; and

(d) unavoidable market risk.

6. The loss absorbing capacity of technical provisions in the reference undertaking corresponds to those of the original undertaking.
7. There is no loss absorbing capacity of deferred taxes for (related to) the reference undertaking
8. The insurance and reinsurance obligations of each line of business (as defined in Article 86(e)) are transferred to the empty reference undertaking in isolation. Hence, there does not arise any diversification benefits between lines of business.

For the purpose of the calculation of the risk margin, the calculation of the SCR of the reference undertaking (using a standard formula or internal model) should be done at least by line of business, based on the segmentation laid down by the implementing measures referred to in Article 86(e).

If the SCR of the original undertaking is calculated by using an internal model, the segmentation may differ from the one laid down by the implementing measures referred to in Article 86(e). However, the risk margin shall always be valued at least at the level of lines of business laid down by those implementing measures.

9. The internal models of the original undertaking (partial or full) can be used to measure the SCR of the reference undertaking to the extent that these models cover at least the risks referred to in no. 5 (assumption 5 regarding the reference undertaking) as defined by the standard formula.
10. The Cost-of-Capital risk margin is defined net of reinsurance only.

The Cost-of-Capital rate

3.137. The Cost-of-Capital rate should be calibrated in a manner that is consistent with the assumptions made for the reference undertaking. In practise this means that the Cost-of-Capital rate should be consistent with the Value-at-Risk-assumption corresponding to a confidence level of 99.5 per cent over the stipulated one-year time horizon as laid down for the calculation of the Solvency Capital Requirement (SCR). Especially, the Cost-of-Capital rate should be independent of the actual solvency position of the original undertaking.

3.138. The risk margin should guarantee that sufficient technical provisions for a transfer are available in all scenarios. Hence, the Cost-of-Capital rate has to be a long-term average rate, reflecting both periods of stability and periods of stress.

3.139. In order to stipulate an adequate placeholder for the Cost-of-Capital rate in the Solvency II regulatory context, the following procedure should be applied:

- Shareholder return models should be used to provide the initial input.
- Some objective criteria for upward and downward adjustments of the provided initial input should be established.
- A final calibration of the Cost-of-Capital rate should be carried out in order to obtain risk margins consistent with observable prices in the marketplace.

3.140. Based on the information currently available a Cost-of-Capital rate of at least 6 per cent is assumed to reflect the cost of holding an amount of eligible own funds for an insurance or reinsurance undertaking being capitalised corresponding to a confidence level of 99.5 per cent Value-at-Risk over a one year time horizon.

Calculation of the risk margin

3.141. In general, the overall risk margin according to the Cost-of-Capital methodology (*CoCM*) should be calculated as follows:

$$CoCM = \sum_{lob} \{ CoC \cdot \sum_{t \geq 0} SCR_{RU,lob}(t) / (1+r_{t+1})^{t+1} \} = \sum_{lob} CoCM_{lob}$$

where

$SCR_{RU,lob}(t)$ = the SCR for a given line of business (*lob*) for year *t* as calculated for the reference undertaking,

r_t = the risk-free rate for maturity *t*; and

CoC = the Cost-of-Capital rate.

3.142. If the SCR of the (original) undertaking is calculated using the standard formula all SCRs (for $t \geq 0$) for a given line of business should be calculated as follows:

$$SCR_{RU,lob}(t) = BSCR_{RU,lob}(t) + SCR_{RU,lob,op}(t) - Adj_{RU,lob}(t),$$

where

$BSCR_{RU,lob}(t)$ = the Basic SCR for the given line of business (*lob*) and year *t* as calculated for the reference undertaking,

$SCR_{RU,lob,op}(t)$ = the partial SCR regarding operational risk for the given line of business (*lob*) and year *t* as calculated for the reference undertaking; and

$Adj_{RU,lob}(t)$ = the adjustment for the loss absorbing capacity of technical provisions for the given line of business (*lob*) and year *t* as calculated for the reference undertaking.

It should be ensured that the assumptions made regarding loss absorbing capacity of technical provisions to be taken into account in the SCR-calculations per line of business, is consistent with the assumptions made for the

overall portfolio (of the original undertaking).

The Basic SCRs for a given line of business ($BSCR_{RU,lob}(t)$ for all $t \geq 0$) should be calculated by using the relevant SCR-modules and sub-modules per line of business (i.e. by restricting the input to be used in the relevant modules to the line of business in question).

Moreover, the calculation of the Basic SCRs (as referred to in the previous paragraph) should be based on the correlation assumptions laid down in Annex IV of the Level 1 text although only the unavoidable market risk and the counterparty default risk with respect to ceded reinsurance is taken into consideration.

- 3.143. With respect to non-life insurance the risk margin as calculated per line of business should be attached to the overall best estimate, that is with no split between risk margins for premiums provisions and for provisions for claims outstanding. This does not preclude other treatments for other purposes.

The overall risk margin

- 3.144. Furthermore, the overall risk margin of the undertaking shall result as the sum of risk margins as calculated for each line of business or each homogeneous group of risks, according to the segmentation that follows from CEIOPS' advice on segmentation (CEIOPS-DOC-22/09). However, this does not preclude other treatments for other purposes.

Annex A. CEIOPS' assessment of the cost-of-capital rate

1. *Introductory remarks*

- A.1. The cost-of-capital rate is an annual rate applied to a capital requirement in each period. Because the assets covering the capital requirement themselves are assumed to be held in marketable securities, this rate does not account for the total return but merely for the spread over and above the risk-free rate.
- A.2. The risk margin shall guarantee that sufficient technical provisions for a transfer are available even in a stressed scenario. Hence, the cost-of-capital rate has to be a long-term average rate, reflecting both periods of stability and periods of stress.
- A rate of (at least) 6% has been assessed to be an adequate placeholder for the cost-of-capital rate in QIS2, QIS3 and QIS4. Shareholder return models provide the initial input.
 - Some objective criteria may cause upward and downward adjustments of the initial input.
 - A final calibration of the cost-of-capital rate, in order to obtain risk margins consistent with observable prices in the marketplace, may be necessary.
- A.3. In addition, one needs to reflect on the assumptions that would be reasonable to make regarding the funding of the capital requirement in a stressed scenario.

2. *Funding of the capital requirement*

- A.4. In the CRO Forum's report, the cost-of-capital rate is calculated as a weighted average of the cost of equity and the cost of debt. It is assumed that 20% of the capital requirement can be funded by issuing debt and that only the remaining 80% have to be funded by raising equity capital. Moreover, by assuming an effective company rate of taxation of 35% over all jurisdictions, the estimated cost of debt is in practise outweighed by the adjustments for tax relief on interest payments made to service the debt. As a result the cost-of-capital rate equals only approximately 80% of the estimated cost of equity rate.
- A.5. It should be noted that the assumed funding based on 80 per cent equity and 20 per cent debt cannot be justified in light of the feedback received during the QIS4-exercise. According to the QIS4-report the participating undertakings reported that 95 per cent of their own funds are classified as tier 1 capital of which only 2 per cent are classified as "subordinated loans" and only 4 per cent as "other reserves (with restricted loss absorbency)". Moreover, only 50 per cent of the tier 2 and tier 3 capital are classified as

subordinated loans or other hybrid capital.⁴⁹ Consequently, the QIS4-results indicate clearly that the assumed debt-funding in any case cannot constitute more than 6-8 per cent of the capital base.⁵⁰

- A.6. Moreover, it may be referred to the high-level political guidance to increase the quality of the external funding (subordinated loans, hybrid capital instruments etc.) of financial institutions. It follows from this that subordinated loans and hybrid capital should have a high loss-absorbing capacity rather similar to "core" capital, cf. the revision carried out in the banking sector. Accordingly, it seems reasonable to expect the cost-differences between equity funding and allowed external funding to diminish.
- A.7. In this context it should also be stressed that since the capital base is defined as the solvency capital requirement in an adverse situation, i.e. as the amount of capital that is substantially at risk, it would be inconsistent to assume at the same time that this requirement can be funded by debt investors at costs substantially below equity.
- A.8. With respect to the assumed impact of taxation (i.e. the tax relief on interest payments) on the assessment of the Cost-of-Capital rate, this aspect will be less important than assumed in CRO Forum's report due to the QIS4-feedback referred to in para A.5 above.⁵¹ However, it still remains to decide on the tax rate(s) to be used if a more detailed analysis of this aspect of the Cost-of-Capital calculations should be carried out.⁵²
- A.9. Based on the considerations given in the previous paragraphs CEIOPS finds that an approach based on the market situation (i.e. the actual combination of equity and debt funding) leads to conclusions similar to the approach used up to now (i.e. 100 per cent equity funding), in particular for the purposes of the assessments summarised in section 3 below.

3. The three-step procedure for assessing the cost-of-capital rate

3.1 Shareholder return models

- A.10. The research carried out by both CRO Forum and GNAIE has been analysed. As the most commonly used models in the market seem to be the Capital Asset Pricing Model (CAPM) and versions of the Fama-French multi Factor Model (FFmF), CEIOPS' analysis has limited itself to the results given by these models.

⁴⁹ Cf. CEIOPS' Report on its fourth Quantitative Impact Study (QIS4) for Solvency II, page 129-132.

⁵⁰ In the remainder of the present sub-section it is referred to "the capital base" and not "the eligible own funds" since the first concept is closest to the terminology used in CRO Forum's report.

⁵¹ A rather peculiar – and likely unintended – implication of the assumptions made in CRO Forum's report should be mentioned. Since the estimated cost of debt is outweighed by the tax-relief on interest payments made to serve this debt, a logical conclusion seems to be that by increasing the (relative) debt-funding an insurance undertaking will be rewarded by a lower Cost-of-Capital rate. According to CEIOPS' understanding this cannot be in line with the intention of Article 77(5) of the Level 1 text.

⁵² It may also be questionable whether an insurance undertaking being in a stressed situation will be in a position to benefit from further tax credits.

(a) *The frictional cost-of-capital approach*

- A.11. In the CRO Forum's research the rate of return above the risk-free rate that shareholders of insurance undertakings require in order to assume broadly diversified insurance risks, are estimated using different methods and assumptions. CRO Forum deems that the so-called frictional cost-of-capital approach is the most appropriate to capture the rate of return an insurance company requires on the capital it deploys to support non-hedgeable risk over a given year.
- A.12. However, CEIOPS has reservations regarding the results based on this approach⁵³ as set out in the CRO Forum' report. Firstly, the results of the method are very dependent on a number of key assumptions – effective tax rate, loss carry forward period and risk-free rate – for which it is difficult to assess reasonable parameter estimates in an EU context. Secondly, of the main components of the frictional costs – double taxation costs, financial distress costs⁵⁴ and agency costs⁵⁵ – only the two first have been modelled.
- A.13. Moreover, the CRO Forum has drawn e.g. the following conclusions after having modelled double taxation and financial distress costs:⁵⁶

For highly capitalized companies, the cost-of-capital rate is determined mainly by the cost of double taxation and the cost of financial distress is negligible. [...]

The cost-of-capital rate depends linearly on a jurisdiction's tax rate for all confidence levels. This means that the cost-of-capital rate (and therefore the MVM) in a jurisdiction with a tax rate of 10% is only half of that in a jurisdiction with a tax rate of 20%.

- A.14. In CEIOPS' opinion the result implied by this conclusion seems unreasonable for Member States in which the effective tax rate is low. Furthermore, CEIOPS also questions the assertion that financial distress costs are negligible for well capitalized companies.

(b) *The CAPM and the FF2F-method*

- A.15. In CRO Forum's research related to the CAPM and the FF2F method, the cost of equity rate above the risk-free rate has been estimated for three markets: Europe, Asia and the US. From these estimated rates a "Global World" rate has been derived for both methods. The Global World rates are in general lower than the European rates, cf. table 2 below.⁵⁷ When

⁵³ Under this approach, the total return required by shareholders may be thought of consisting of the base cost of capital, the frictional costs and the expected economic profit. Only the frictional costs are taken into account in determining the cost-of-capital rate.

⁵⁴ These are direct and indirect costs which arise when an insurer has difficulties meeting its financial obligations to policyholders or debt holders.

⁵⁵ Agency costs are associated with the misalignment of the interest between management and shareholders or between policyholders and shareholders. The lack of transparency and informational asymmetry are also deemed to be part of agency costs.

⁵⁶ Cf. CRO Forum's report, page 36.

⁵⁷ In the CAPM case, the reported Global rates are lower than the reported rates for all three markets, a result that could have benefited from a more thorough explanation in the report.

concluding on an appropriate level of the cost-of-capital rate, CRO Forum has taken into account only the lower Global World rates without giving any explicit rationale for this choice.

- A.16. CEIOPS finds it more appropriate to base the assessment of the cost-of-capital rate on CRO Forum’s results for the CAPM and the FF2F method for European insurance undertakings. In this context it may also be noted that the FF2F-results for the European non-life insurers are in line with the results referred to in GNAIE’s report for US non-life insurers (an equity risk premium of 14.2%).

*Table 2. Equity Risk Premiums as assessed in the CRO Forum’s report.*⁵⁸

	CAPM		FF2F	
	European market	Global market	European market	Global market
Life	10.0 %	5.1 %	11.8 %	9.4 %
Non-life	7.4 %	4.2 %	12.5 %	9.6 %

- A.17. Taking into account only the results from the shareholder return models a cost-of-capital rate of 7.5% - 10% seems to be adequate. It should, however, be noticed that the figures reproduced in table 2 are based on historical averages during normal times only and do not take into account stressed scenarios in an adequate manner.

3.2 Adjustment of shareholder return

- A.18. To the output from the shareholder return models, both upward and downward adjustments are needed when assessing the cost-of-capital rate in a solvency context.
- A.19. Downward adjustments: In order to account for the fact that a key source of return that exists for going concerns (the so-called franchise value related to expected profit from new business) may not be demanded by capital providers in a transfer context, a downward adjustment is needed. No reliable quantitative results are available concerning the size of this adjustment.
- A.20. Upward adjustments: Additional costs, i.e. costs beyond those required to compensate investors for the risk they are assuming, make an upward adjustment necessary. These additional costs may stem from:
- Frictional costs of carrying capital. These are additional costs⁵⁹ which reflect a variety of indirect costs, as frictional costs related to managers’ incentives, information asymmetries, and so on. Again, these costs are very difficult, if not impossible, to quantify.

⁵⁸ Cf. CRO Forum's report, page 58, 60 and 61.

⁵⁹ Cf. the GNAIE-report, page 30.

- Initial costs of raising capital. These are fees for underwriting, listing and regulation, which in most jurisdictions are not negligible.⁶⁰
- Corporate income taxes on the risk margin in some tax jurisdictions. This is the case if the risk margin is considered as taxable profit at inception and not as taxable income only over the time of its release from the risk margin.

A.21. As already indicated, the aggregate effect of both upward and downward adjustments is difficult to quantify in a reliable manner. However, as it is unlikely that the downward adjustment outweighs the upward adjustments by a large margin, a reasonable range for the cost-of-capital rate taking into account these necessary adjustments could be 6% to 8%.

3.3. Calibration to market prices

A.22. The output for the cost-of-capital rate has to be calibrated further to give final risk margins consistent with observable prices in the marketplace. The risk margin together with the best estimate shall be "equivalent to the amount insurance and reinsurance undertakings would be expected to require in order to take over and meet the insurance and reinsurance obligations" (Article 76(3)).

A.23. In the Solvency II context an allowance may be necessary for the methodologies applied when calculating the capital base (i.e. the future SCRs). This is especially the case for any simplifying methods allowed.⁶¹ All other assumptions equal, especially for unchanged best estimate, the cost-of-capital rate has to be set higher if methods used in the solvency context give systematically lower capital bases than the capital bases assessed through the markets in real insurance portfolio transfers. Otherwise the technical provisions will be insufficient.

A.24. As long as the method used in assessing the capital base does not systematically underestimate the needed amount, a cost-of-capital rate of at least 6% could be seen as adequate. In order to avoid procyclical effects, the cost-of-capital rate should not be adjusted to follow market cycles.

⁶⁰ Underwriting fees, which generally constitute at least half of the direct IPO costs, amount to about 3.5% of the raised equity in the UK, Germany or France, and to more than 6.5% in the USA. Source: Oxera report (2006), "The Cost of Capital: An International Comparison". Available at www.oxera.com.

⁶¹ In QIS4 a majority of undertakings (independently of their size) used simplifications when making SCR-projections for the risk margin calculations.

A technical addendum on CAPM and FFMF Models

1. Quantification using the Capital Asset Pricing Model

- A.25. The CAPM is a traditional model from financial theory. It is the most popular method used to estimate the cost of equity capital among large publicly traded companies.
- A.26. The expected cost of equity for a firm "j", written $E(R_j)$, can be derived from the risk-free rate R_f , the expected price $E(R_m)$ of the market portfolio R_m and the firm's beta, which reflects the correlation of the firm's returns with those of the equity market overall:

$$E(R_j) = R_f + \beta_j * (E(R_m) - R_f),$$

$$\text{with } \beta_j = (\rho_{jm} * \frac{\sigma_j}{\sigma_m}), \text{ where } \sigma_j = \sigma(R_j), \sigma_m = \sigma(R_m) \text{ and } \rho_{jm} = \frac{\text{Cov}(R_j, R_m)}{\sigma(R_j) * \sigma(R_m)}$$

This gives the cost of equity above risk-free return (equity risk premium ERP) for a firm "j", as beta of this firm times market returns over risk-free:

$$ERP_j = E(R_j) - R_f = \beta_j * (E(R_m) - R_f).$$

- A.27. In the research commissioned by the CFO Forum equity risk premium rates for the European market were estimated⁶² to be 10.03% for Life and 7.35% for Non-life.
- A.28. In the above calculation the average over the estimated betas for European insurance companies from 1998 to 2006 was used: 0.94 for Non-Life insurance companies and 1.28 for Life companies. The expected excess market risk premium used was 7.81%, assessed on US-data from years 1926 to 2006.

2. Quantification using a Fama-French Multi Factor Model

- A.29. The Fama-French multi factor-asset pricing model was developed because the systematic risk factor in the CAPM model alone does not adequately explain stock returns. Fama and French have shown that adding a second or third factor significantly increases the explanatory power of the model.
- A.30. In the research commissioned by the CRO Forum, the equity risk premium rates from the Fama-French 2-factor model (the second factor is related to the ratio of the book value of equity relative to the market value) were estimated for the European market to be 12.54% for Life and 11.76% for Non-life.⁶³

⁶² CRO Forum Research, "Table 4: Full Information Beta CAPM Dollar Denominated Cost of Equity Capital Estimates for the U.S., European, Asian and Global Insurance Industry: 1998 – 2006", on page 58.

⁶³ CRO Forum Research, "Table 5: Full Information Beta International Fama-French Two Factor Dollar Denominated Cost of Equity Capital Estimates for the U.S., European, Asian and Global Non-Life Insurance Industry: 1998 – 2006", on page 60 for non life and Table 6 on page 61 for life companies.

A.31. In the research commissioned by the GNAIE the equity risk premium rates for US-based non life insurers was estimated to be 14.17%. Thereby a market risk premium of 8.4%, a risk free rate of 4% and the parameters for the Fama-French 3 Factor model resulting from an exhaustive analysis of US-based P&C insurers by Cummins and Phillips⁶⁴, were used.

⁶⁴ J. D. Cummins and R. D: Phillips, Estimating the Cost of Equity Capital for Property-Liability Insurers, The journal of Risk and Insurance, 2005, Vol. 72, No 3.

Annex B. Impact assessment on the cost-of-capital rate for the risk margin

In its Call for Advice of 1 April 2009, the Commission has asked CEIOPS to contribute to the Commission's impact assessment of the Level 2 implementing measures.⁶⁵ To this end, a list of issues has been set up by the Commission and CEIOPS, identifying the Level 2 implementing measures that should be accompanied by an impact assessment. The objectives of the issues have been selected among the list of objectives used by the Commission in its Level 1 impact assessment.⁶⁶ On 12 June 2009, the Commission has issued an updated list of policy issues and options, to which reference is being made.⁶⁷ This impact assessment covers issue 2 (sub-issue A) of the list of policy issues and options.

Two summary tables accompanying the impact assessment are published in a separate excel document.

1. Description of the policy issue

- B.1. The Level 1 text states that technical provisions shall correspond to the current amount (re)insurance undertakings would have to pay if they were to transfer their (re)insurance obligations immediately to another undertaking. They are calculated in a "prudent, reliable and objective manner". Their value is equal to the sum of a best estimate and a risk margin where the best estimate corresponds to the probability-weighted average of future cash-flows taking into account the time value of money. If future cash flows associated with insurance or reinsurance obligations can be reliably replicated using financial instruments for which a reliable market is observable, the separate calculation of best estimate and risk margin shall not be required.
- B.2. This impact assessment only concerns those insurance or reinsurance obligations for which a separate calculation of the risk margin is required.
- B.3. The valuation of technical provisions should be based on sound economic principles. This means that the technical provisions should be consistent with the valuation of assets and other liabilities, they should be market consistent and in line with international developments in accounting and supervision.
- B.4. The Level 1 text further defines the amount of technical provisions as the value which correspond to the amount an insurer would have to pay if it transferred its contractual rights and obligations immediately to another undertaking and the amount that another undertaking would

⁶⁵ <http://www.ceiops.eu/media/files/requestsforadvice/EC-april-09-CfA/EC-call-for-advice-Solvency-II-Level-2.pdf>.

⁶⁶ http://ec.europa.eu/internal_market/insurance/docs/solvency/impactassess/final-report_en.pdf.

⁶⁷ <http://www.ceiops.eu/media/files/requestsforadvice/EC-June-09-CfA/Updated-List-of-policy-issues-and-options-for-IA.pdf>.

be expected to require to take over and meet the underlying (re)insurance obligations. Due to the nature and uncertainty embedded in the best estimate, the value of the best estimate should be adjusted by increasing the best estimate with a risk margin to achieve a market consistent valuation of technical provisions. The risk margin represents the cost of providing the amount of eligible own funds to cover the Solvency Capital Requirement necessary to support the obligations over the lifetime thereof. The Level 1 text in Article 77(5) further requires that the rate used to determine the cost of providing the amount of eligible own funds should be the same for all (re)insurance companies and be reviewed periodically. The annual rate used, which is called cost-of-capital rate, should be equal to the additional rate above the relevant-risk-free interest rate, that a (re)insurance undertaking would incur to hold the necessary eligible own funds.

B.5. The issue at hand concerns the appropriate level of the cost-of-capital rate and, if necessary, the modalities for its periodic review.

2. Detailed description of policy options and assessment of the relative impacts on the different affected parties

Detailed description of policy options

B.6. Option 1: Cost-of-capital rate equal to 6%, as specified in QIS4

Under this option, the level of the cost-of-capital rate should be equal to 6%, as specified in QIS4. The QIS4 calibration of the cost-of-capital rate was based on the Swiss Solvency Test. However, as described further in this document, the level of 6% is also consistent with the results of models such as the Capital Assets Pricing Model (CAPM) and the Fama-French multi Factor Model (FFmF).

B.7. Option 2: Cost-of-capital rate lower than 6%

Under this option, the level of the cost-of-capital rate should be lower than 6%. This would mean that the cost-of-capital rate could be determined based on models such as the Capital Assets Pricing Model (CAPM) and versions of the Fama-French multi Factor Model (FFmF) which are commonly used in the market.

If the cost-of-capital rate were to be calibrated based on current data, its calibration should be periodically reviewed based on the selected model.

B.8. Option 3: Cost-of-capital rate higher than 6%

Under this option, the level of the cost-of-capital rate should be higher than 6%. Similarly to Option 2, its calibration should consider the selection of the model and the periodic review of the cost-of-capital rate.

Specific questions that were addressed in the discussion of the policy options include: What would be an appropriate level? How should it be

calibrated / updated? Should it be the same for both life and non-life business?

Impact on industry, policyholders and beneficiaries and supervisory authorities

Costs and benefits

- Industry

- B.9. Considering the CRO Forum study⁶⁸ which concluded that the annual cost-of-capital rate should be between 2.5% and 4.5%, CEIOPS expects that some members of the industry are likely to disagree with options 1 and 3.
- B.10. QIS4 results show that for 75% of undertakings, the risk margin in proportion to the best estimate was less than 5% for life insurance and less than 10% for non-life insurance.
- B.11. The ratio of the risk margin (RM) to the best estimate (BE) for some alternative choices of the cost-of-capital rate is illustrated in table 1.

Table 1.

Cost-of-capital rate	Ratio of RM to BE	
	Life insurance	Non-life insurance
6 %	5 %	10 %
4.5 %	3.8 %	7.5 %
2.5 %	2.1 %	4.2 %
7.5 %	6.3 %	12.5 %

- B.12. However, a further distinction should be made between life and non-life insurance undertaking. In life insurance the ratio of both the available capital and the SCR to best estimate liabilities is likely to be much lower than the corresponding ratios in non-life insurance. Accordingly, the impact of a given change in the cost-of-capital rate (e.g. in order +/- 1 to 1.5 percentage point, cf. table 1) may have a considerable impact on the available capital of life insurers but only a moderate impact on the available capital of non-life insurers.
- B.13. Accordingly it seems reasonable to believe that a change of the cost-of-capital rate in the order of +/- 1 to 1.5 percentage point (e.g. from 6 % to a value in the interval 4.5% – 7.5%) would not lead to significant changes in the behaviour of non-life insurance undertakings. With respect to life insurance undertakings a more careful and detailed analysis of the potential change of behaviour is needed – especially for

⁶⁸ <http://www.croforum.org/publications.ecp> (Market Value of Liabilities for Insurance Firms – Implementing elements for Solvency II).

cases where it may be considered to increase the cost-of-capital rate beyond 6% – due to the non-negligible impact on the available capital of these undertakings.

- Policyholders and beneficiaries

B.14. Policyholders and beneficiaries can be affected in two different ways, one minor and one major. A minor effect is that a higher cost-of-capital rate means a higher risk margin and consequently higher premiums to pay if premiums were to fund the risk margin. However, a higher risk margin would also mean higher technical provisions and better protection of the policyholders and beneficiaries.

B.15. The cost-of-capital parameter impacts the amount a (re)insurance undertaking would require to accept a transfer of insurance and reinsurance obligations. There is considerable uncertainty with regard to the calibration of this parameter.

- Insurance and reinsurance undertakings

B.16. Regarding the impact on the (re)insurance undertaking, option 2 results in lower technical provisions compared to the other two options. Option 3 will generate the highest technical provisions compared to the other two options.

B.17. It is unlikely that the alternative choices of cost-of-capital rates within a reasonably bounded interval (e.g. from 4.5% to 7.5%) will lead to significantly different behaviour of the non-life insurance undertakings. However, for life insurance undertakings the impact on the undertakings' available capital of a change in the cost-of-capital rate from, say, the middle to the upper end of the indicated interval may trigger a change in their behaviour.

- Supervisory authorities

B.18. The determination of the option which will have a neutral effect depends on which cost-of-capital rate is consistent with the market "cost of capital". There is a risk that the value of technical provisions will not be sufficient to transfer the portfolio to another undertaking.

B.19. From the perspective of the supervisory authority, the option which in most cases results in technical provisions which are consistent with the current transfer value is also the most acceptable.

B.20. In general, there is also a potential risk that it would not be possible to transfer the portfolio of a distressed insurer to a third party insurer if the cost-of-capital rate is expected to increase from one year to the next.

3. Relevant objectives

- B.21. A general objective relevant for this policy option is to “enhance the protection of the policyholders and beneficiaries”.
- B.22. The calibration of the cost-of-capital rate falls under the scope of the following operational objectives:
- harmonise the calculation of technical provisions,
 - introduce risk-sensitive harmonised solvency standard,
 - introduce proportionate requirements for small undertakings and
 - promote comparability of valuation and reporting rules with the international accounting standards elaborated by the IASB.

4. Comparison between the different options based on the efficiency and effectiveness in reaching the relevant operational objectives

- B.23. The comparison and ranking of the policy options is based on the effectiveness and efficiency of each option in reaching the relevant operational objectives. Effectiveness is defined as the extent to which options achieve the objectives of the proposal. Efficiency is defined as the extent to which the objectives can be achieved at the lowest cost (cost-effectiveness).
- B.24. The sources of evidence available to CEIOPS are the research commissioned by the CRO Forum⁶⁹ and the research commissioned by GNAIE⁷⁰ (see Annex A).
- B.25. It is expected that all options achieve harmonisation of the calculation of technical provisions as all insurance and reinsurance companies will use the same cost-of-capital rate to calculate the risk margin.
- B.26. It is impossible to determine which option better promotes compatibility of valuation rules with international accounting standards elaborated by IASB because this could only be checked when the portfolio will be transferred to another undertaking. A fixed cost-of-capital rate does not introduce risk-sensitive harmonised solvency standard but introduces proportionate requirements for small undertakings.
- B.27. Option 1 is most likely to facilitate the transfer of liabilities in practice since this is closest to the market cost-of-capital. Under option 2 the risk margin will be low and hence the technical provisions will not be

⁶⁹ <http://www.croforum.org/publications.ecp> (Market Value of Liabilities for Insurance Firms – Implementing elements for Solvency II).

⁷⁰ Study prepared by Ernst & Young: “Market Value Margins for Insurance Liabilities in Financial Reporting and Solvency Applications”, dated October 2007, commissioned by GNAIE – Group of North American Insurance Enterprises.

sufficient to transfer the liabilities. Under option 3 it is expected that the technical provisions will be more than sufficient to facilitate a transfer. However there may be unintended costs to policyholders if technical provisions are unnecessarily high. Finally there is also a potential risk that it would not be possible to transfer the portfolio of a distressed insurer to a third party insurer if the cost-of-capital rate increases from one year to the next.

- B.28. The level of 6% (option 1) most closely represents the market cost of capital. This is based on the analysis summarised in Annexes 1 and 2 in this paper and the calibration from the Swiss Solvency Test. The objective of achieving compatibility with IASB market consistent valuation is hence best achieved through this option. Furthermore, the market cost-of-capital evolves over time, which will allow for appropriate risk-sensitiveness.
- B.29. Also option 3 results in an amount of technical provisions which would be enough for a transfer of the portfolio to another undertaking. However option 3 may lead to undertakings holding unnecessarily high technical provisions. On the other hand, option 2 results in technical provisions which are not sufficient to enable the portfolio transfer. Option 2 will have a permanent negative effect compared to options 1 and 3 as technical provisions will not be sufficient to effect a transfer leading to lower protection of the policyholders. On the other hand, option 3 may lead to technical provisions which are higher than necessary without any additional benefit. This may endanger the risk sensitiveness of the calculation.
- B.30. CEIOPS notes that the assumption that a single cost-of-capital rate is applicable for the whole European Union is a significant simplification as the cost-of-capital varies across markets. In this respect, option 1 will best reach the objective of harmonising the calculation of the technical provisions, while at the same time achieving appropriate risk-sensitiveness. There is some scope in the Level 1 text for periodic reviews of the cost-of-capital rate. However this has not been addressed in the impact assessment (i.e. the impact assessment is based on the assumption that the cost-of-capital rate will not be reviewed). The cost-of-capital rate should be the same for life and non-life business. Additionally, there seems to be no evidence that the cost of providing the amount of eligible own funds necessary to support the (re)insurance obligations would be substantially different for life and non-life insurance undertakings.
- B.31. In order to introduce proportionate requirements for small undertakings and achieving the balance with sufficient risk sensitiveness, the cost-of-capital rate should not be updated too frequently. An annually updated cost-of-capital rate would be seen as too frequent as it may increase the volatility of the balance sheet since different cost-of-capital rates will be applied at the end of each financial period. This may have an effect on the sustainability of the value of technical provisions as well as on risk management and consistency because it would be more difficult to predict the cost-of-capital rate.

B.32. In conclusion, taking into account the potential cost and benefits for policyholders and beneficiaries, insurance and reinsurance undertakings and supervisory authorities, the effectiveness and efficiency level to meet the relevant objectives, and its sustainability and comparability levels, CEIOPS recommends in its advice that the cost-of-capital should be fixed to at least 6 per cent.

Annex C. Impact assessment on diversification benefits in the risk margin

In its Call for Advice of 1 April 2009, the Commission has asked CEIOPS to contribute to the Commission's impact assessment of the Level 2 implementing measures.⁷¹ To this end, a list of issues has been set up by the Commission and CEIOPS, identifying the Level 2 implementing measures that should be accompanied by an impact assessment. The objectives of the issues have been selected among the list of objectives used by the Commission in its Level 1 impact assessment.⁷² On 12 June 2009, the Commission has issued an updated list of policy issues and options, to which reference is being made.⁷³ This impact assessment covers issue 2 (sub-issue B) of the list of policy issues and options.

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

1. Description of the policy issue

- C.1. The Level 1 text states that the technical provisions correspond to the current amount (re)insurance undertakings would have to pay if they were to transfer their (re)insurance obligations immediately to another undertaking. The calculation of technical provisions should make use and be consistent with information provided by the financial markets and generally available data on underwriting risk. They are calculated in a "prudent, reliable and objective manner". The technical provisions are equal to the sum of a best estimate and a risk margin (unless the criteria for calculating the technical provisions as a whole are fulfilled). The risk margin shall be such as to ensure that the value of technical provisions is equivalent to the amount another (re)insurance undertaking (a reference undertaking) would be expected to require in order to take over and meet the insurance and reinsurance obligations.
- C.2. In other words, the risk margin shall be calculated by determining the cost of providing an amount of eligible own funds equal to the Solvency Capital Requirement necessary to support the insurance and reinsurance obligations over the lifetime thereof. The amount of technical provisions should reflect the characteristics of the underlying insurance portfolio. Undertaking-specific information should only be used in the calculation insofar as that information enables insurance and reinsurance undertakings to better reflect the characteristics of the underlying insurance portfolio.
- C.3. In order to harmonise the calculation of the risk margin throughout the European Union the assumptions to be fulfilled by the reference under-

⁷¹ <http://www.ceiops.eu/media/files/requestsforadvice/EC-april-09-CfA/EC-call-for-advice-Solvency-II-Level-2.pdf>

⁷² http://ec.europa.eu/internal_market/insurance/docs/solvency/impactassess/final-report_en.pdf

⁷³ <http://www.ceiops.eu/media/files/requestsforadvice/EC-June-09-CfA/Updated-List-of-policy-issues-and-options-for-IA.pdf>.

taking should be determined. In particular, whether or not diversification effects should be taken into account in the calculation of the risk margin, should be analysed as part of the impact assessment of implementing measures.

- C.4. Recognising diversification benefits leads to lower financial requirements. Diversification benefits are explicitly allowed for in the calculation of the Solvency Capital Requirement between different risks and risk modules. The issue to be analysed is to what extent diversification effects should also be taken into account in technical provisions, more specifically in the risk margin. The outcome of this analysis will depend on the assumptions made regarding the reference undertaking assumed to take over and meet the underlying insurance and reinsurance obligations for each line of business.

2. Detailed description of policy options and assessment of the relative impacts on the different affected parties

Detailed description of policy options

- C.5. Option 1: The reference undertaking is a well-diversified undertaking.

If the reference undertaking is assumed to be well-diversified, then this would imply that market-wide diversification effects are recognised by all undertakings, even if they are not diversified themselves.

- C.6. Option 2: After the transfer has taken place, the reference undertaking is a mirror image of the undertaking transferring the risk.

If the reference undertaking – after the transfer of insurance and reinsurance obligations has taken place – is assumed to be a mirror image of the insurer transferring the risk, then the insurer could take into account the diversification effects assumed to be present in its own business.

- C.7. Option 3: Before the transfer takes place the reference undertaking is an empty undertaking.

If the reference undertaking is assumed to be empty before the transfer of insurance and reinsurance obligations take place, then it is also reasonable to assume that no diversification effects across lines of business could be taken into account in the risk margin.

Impact on industry, policyholders and beneficiaries and supervisory authorities

Costs and Benefits

- Industry
- C.8. Option 3, which leads to no recognition of diversification benefits will generate the highest technical provisions compared to the two other options. This could be considered as a cost by the industry.
- Policyholders and Beneficiaries
- C.9. Policyholder protection stems in part from the possibility to transfer liabilities. However, a transfer of the liabilities is only achievable in practice if the ensuing increase in the technical provisions of the transferee (accepting undertaking) is not bigger than the amount of the technical provisions transferred. Otherwise the risk margin of the transferee would be insufficient to support the cost of providing an amount of eligible own funds equal to the Solvency Capital Requirement necessary to support the (re)insurance obligations over the lifetime thereof.
- C.10. More generally, from a policyholder perspective, because recognising diversification benefits leads to lower financial requirements, the protection against the risk of the insurer not meeting its commitments is higher.
- Supervisory authorities
- C.11. Supervisory authorities will be concerned to be able to determine a workable reference undertaking, which would not impede the transfer to another undertaking. The choice for one or the other option will very much depend on this.
- C.12. Allowing for diversification may lead to inappropriate policyholder protection as the majority of undertakings would not be as well diversified as the reference undertaking. Therefore, the risk margin based on a well diversified reference undertaking would not be adequate for the undertaking to provide the eligible own funds needed to run-off its own insurance and reinsurance obligations.
- C.13. From a supervisory point of view the risk margin should have the following properties:
1. It is possible to calculate the risk margin for the individual segments.
 2. The risk margin of a segment depends on the risks related to that segment (e.g. line of business, duration of the obligations, amount of reinsurance, quality of reinsurers).
 3. The same segment of obligations will always result in the same amount of risk margin (it does not depend on other undertaking-specific information).

4. The segment of obligations can be transferred to any other undertaking.
5. In a portfolio transfer the amount of risk margins in those segments that are not transferred is unchanged.
6. The undertaking is able to run off its own obligations.

3. Relevant objectives

C.14. The assumptions made about the reference undertaking that is assumed to take over and meet the underlying insurance and reinsurance obligations fall under the scope of the following general, specific and operational objectives. In general, the calculation of the risk margin should enhance protection of the policyholders and beneficiaries, by improving the risk management of the EU (re)insurer and increasing transparency.

C.15. The relevant operational objectives are

- harmonise the calculation of technical provisions,
- introduce risk-sensitive harmonised solvency standards,
- introduce proportionate requirements for small undertakings and
- promote compatibility of valuation and reporting rules with the international accounting standards elaborated by the IASB.

4. Comparison between the different options based on the efficiency effectiveness in reaching the relevant operational objectives

C.16. The comparison and ranking of the policy options will be based on the effectiveness and efficiency of each of them in reaching the relevant operational objectives. Effectiveness is defined as the extent to which options achieve the objectives of the proposal. Efficiency is defined as the extent to which objectives can be achieved at the lowest cost (cost-effectiveness).

Risk sensitiveness

C.17. An integral part of the risk management is to reduce risk through the diversification of insurance and reinsurance obligations. In the case of options 1 and 3 the management of undertakings would not be incentivized to minimise the insurance risk through diversification of the insurance portfolio across different lines of business. Both options may therefore affect risk mitigation through the diversification of risks. This may ultimately lead to low standard solvency standards. Therefore the appropriate risk sensitiveness of the approach may not be fully achieved.

- C.18. There is a risk that under option 1 and to some extent under option 2 technical provisions for a given line of business would not be sufficient to be transferable to another undertaking. Policyholder protection could be threatened under option 2 as it would only be possible to transfer liabilities to (re)insurance undertakings which after that transfer are at least as well diversified as the undertaking which is transferring the liabilities. Furthermore, if the undertaking would transfer (re)insurance obligations of only a part of its lines of business, the technical provisions for the lines of business that remain at the undertaking, would not be adequate.
- C.19. Taking into account the discussion in section 2 of this paper on the difficulty of achieving a transfer in practice, option 1 does not fulfil the general requirement of enhancing the protection of the policyholders and beneficiaries. Allowing all undertakings to take into account a well-diversified portfolio will not encourage management to improve the risk management of the (re)insurers. Depending on the choice of the reference undertaking, option 1 could meet the operational objective to harmonise the calculation of technical provisions but it will not increase transparency because it does not take into account the insurance or reinsurance specific risk profile. Option 1 does not introduce a risk-sensitive harmonized solvency standard.
- C.20. Under option 2, even if the technical provisions are sufficient to transfer the whole portfolio to another undertaking, the technical provisions would not be sufficient to transfer selected lines of business separately. This is problematic from a supervisory point of view since transfers of portfolios are an important tool in the supervisory toolkit when the interests of policyholders and beneficiaries are in jeopardy. From a supervisory point of view the same portfolio of obligations should result in the same amount of technical provisions (except consideration of expenses which could be differently integrated in the assessment). This is not the case with option 2.
- C.21. Option 3 ensures the highest level of policyholder protection since it assumes the lowest level of diversification of the reference undertaking. It is therefore possible in practice to transfer the liabilities to any (re)insurance undertaking. There would also be no need to increase the value of the remaining liabilities if the undertaking transferred only part of its obligations. From a supervisory perspective, option 3 is the most acceptable since it results in the highest likelihood of achieving a transfer of the full portfolio in practice and also facilitates the transfer of selected lines of business to another undertaking. The undertaking would also be able to run-off its obligations. The same insurance portfolio would result in the same amount of technical provisions for each line of business independent of the other lines of business in the undertaking. This would mean that undertaking-specific information is only used to better reflect the characteristics of the underlying insurance portfolio. Moreover, this option will not raise questions with regard to the determination of the well-diversified portfolio for the reference undertaking.

Harmonised calculation and compatibility with IAIS/IAA

- C.22. If an artificial, well-diversified reference undertaking should reflect the amount of diversification observed in the market, it has to be decided whether it should be constructed based on national markets or if it should represent the whole European market. If the reference undertaking depends on the national market then the criterion that the assumptions regarding the reference undertakings should be harmonised throughout the European Union is not satisfied. Furthermore, a decision would need to be made on how to determine the reference undertaking in those Member States where old composites, new composites, pure life and pure non-life insurance undertakings co-exist, as well as where both pure reinsurers and direct insurers underwrite reinsurance business. Since not only the diversification but also the absolute size of the reference undertaking has an impact on the amount of the risk margin, there are great difficulties also with the definition of a European Union-wide reference undertaking. It could easily be criticized that whatever the choice, it would not be market consistent, hence not compatible with market consistent valuation principles under IAIS and IAA.
- C.23. Simplified methods will most probably be necessary for small undertakings under option 1. This option also does not promote comparability of valuation and it goes against the objective of convergence with the work of the IASB on international accounting standards as well as that of the IAIS.
- C.24. Options 1 and 3 enable comparing the amount of technical provisions for similar (re)insurance obligations. However, with respect to option 1 one would have to agree on the assumptions to be fulfilled by the well-diversified undertaking and especially the criteria to be applied when calculating risk margins for the individual lines of business. A comparison of the amount of technical provisions would not be possible under option 2. Therefore the harmonisation of the calculation of technical provisions would not be achieved.
- C.25. Furthermore, under option 3 transfers of obligations would not be limited by the size and portfolio diversification of the accepting undertaking, which is necessarily not the case with options 1 and 2. Under options 1 and 2 the amount of technical provisions of the (re)insurance company that transfers the obligations would need to be increased if only the (re)insurance obligations related to some of the lines of business are transferred to another undertaking. Under option 1 the technical provisions would be insufficient also in cases where the undertaking has to run-off its own obligations.
- C.26. Under option 2 the value of the risk margin would be volatile, following changes of the portfolio mix over time, which is not the case for options 1 and 3.
- C.27. Based on the determination of the risk profile of well-diversified undertakings (option 1), the valuation of the risk margin may not be

harmonised between big and small (re)insurance undertakings with similar portfolio mix, due to the bigger relative impact of diversification effects on risk margin for smaller portfolios.

- C.28. Furthermore, options 1 and 2 could be workable for a (re)insurance undertaking only if the risk margin would be calculated as a whole and there would be no requirement to distribute the risk margin between the lines of business. Options 1 and 2 are therefore in conflict with Article 79 of the Level 1 text, which requires segmentation of technical provisions – i.e. both the best estimate and the risk margin – into homogenous risk groups and as a minimum by lines of business.
- C.29. Option 1 is also problematic in terms of how to determine the risk profile of the well-diversified undertaking. This definition is crucial as it would have a direct impact on the amount of technical provisions in every insurance and reinsurance undertaking within the European Union.

Conclusion

- C.30. Option 2 encourages undertakings to improve risk management through diversification across lines of business, but it will only partly meet the objective of enhancing the protection of the policyholders and beneficiaries. Option 2 introduces a risk-sensitive harmonized solvency standard. Under Option 2 simplified methods should probably be determined for small undertakings. Option 2 might not promote comparability of valuation nor convergence with the work of the IASB on international accounting standards nor that of the IAIS.
- C.31. Option 3 fully meets the general objective to enhance the protection of policyholders and beneficiaries. This option also fulfils the specific objective to increase transparency and the operational objective to harmonise the calculation of the technical provisions. The specific objective to improve the risk management of the EU (re)insurers would probably not be harmed although undertakings will not be rewarded for diversification between lines of business. To some extent option 3 introduces a risk-sensitive harmonized solvency standard. Under option 3 no simplified methods will be needed specifically for small undertakings. Not including diversification effects goes towards comparability of valuation and convergence with the work of the IASB on international accounting standards and that of the IAIS.
- C.32. In conclusion, taking into account potential costs and benefits for policyholders and beneficiaries, insurance and reinsurance undertakings and supervisory authorities, the effectiveness and efficiency level to meet the relevant objectives, CEIOPS recommends option 3 in its advice.