

Additional CEA Guidance on the cost-of-capital calculation

CEA reference:	Annex 1 to ECO 7113	Date:	11 May 2007
Referring to:	QIS 3	Solvency II	
Related CEA documents:	QIS3 Guidance		
Contact person:	Ecofin department	E-mail:	ecofin@cea.assur.org
Pages:	5		

1. Introduction

- 1.1 CEIOPS has released the final specification for its third Quantitative Impact Study ("QIS 3"). The cost-of-capital (CoC) approach is now tested as primary method for the calculation of the risk margins. The description of the approach is provided in sections I.1.39 – I.1.72 and II.1.12 – II.1.19 of the specification.
- 1.2 In addition to the descriptions, CEIOPS has include a helper tab in its final excel sheet which can be used to derive an approximation of the risk margin following a cost of capital methodology "**V.A.4 CoC Risk margin**".
- 1.3 It should be noted that in order to avoid circularity, the calculation of the risk margin does not affect the SCR calculation since only the technical provision before risk margin is used when determining the capital requirements.

This implies that the risk margin can be derived separately and independently from the SCR calculation and will later be added to the best estimate liability.

Issues raised in CEA Guidance on QIS 3¹

- 1.4 QIS3 indicates that the calculation of the market value margin should be performed at the line of business level or at the level of homogenous risk groups (see I.1.47). This approach will not take into account allowance for diversification across the different lines of business and is therefore not consistent with the underlying principle that in stressed conditions, the company has sufficient assets to transfer (all) its liabilities to a notional third party. In particular, this could lead to an overstatement of the market value margin for multi line non-life insurance companies where diversification is likely to be more material.
- 1.5 Further there are still areas within the cost of capital approach which require further investigation including:
 - The basis for including premium risk for one year in the cost of capital calculation
 - The basis for including market risk for one year in the cost of capital calculation
 - Whether the calibration of 6% cost of capital is appropriate
 - The extent to which issues relating to the calibration of the SCR for non-hedgeable risks are adversely impacting the cost of capital approach

¹ Available under the Solvency II section on www.cea.assur.org

- 1.6 In particular, this could lead to an overstatement of the risk margin for multi line non-life insurance companies where diversification is likely to be more material.

CEIOPS helper sheet for the Cost of Capital approach

- 1.7 Companies may be concerned at the level of complexity underlying the helper sheet provided by CEIOPS. However, some complexity is probably inevitable given that a single spreadsheet is used for both life and non-life business and the calculation makes use of potentially different run-off patterns for each of the non-hedgeable risks.
- 1.8 We note that the sheet does all the necessary calculations once the run-off patterns are input by users. As a reminder, conceptually the methodology to calculate the market value margin and can be broken down into the following four steps:
- Step 1 : Calculation of the SCR for the purpose of the CoC calculation at $t=0$
 - Step 2 : Calculation of the SCR for the purpose of the CoC calculation at $t=1, t=2, t=3, \dots$
 - Step 3 : Calculation of the projected capital charges at $t=1, t=2, t=3, \dots$
 - Step 4 : Calculation of the present value of the capital charges

Purpose of this document

- 1.9 In order to support companies through the process and for companies to understand the materiality of the issues raised in the CEA guidance on QIS 3, the CEA has set up additional [CEA helper tabs](#) that companies can use to calculate the market value margin allowing for
- full diversification across the lines of business ;
 - excluding premium risk in the calculation of the SCR at $t=1$
 - excluding market risk in the calculation of the SCR at $t=1$

Please note that in terms of complexity the CEA helper tab has not changed compared to the CEIOPS helper as we have kept the allowance for multiple run-off patterns.

- 1.10 In addition, we recognise that there may be a number of companies that cannot break-up their run-off calculations by LoB / Homogeneous risk group. As a fall back option for these companies, CEA has also included a [CEA simplified tab](#) within the QIS3 spreadsheet that mimics the one that was included for QIS2.

The calculations in this simplified tab should give companies with limited resources the ability to estimate the market value margin in an easy way. It will also help companies to understand the fundamental concepts underlying the Cost of Capital approach.

- 1.11 We would like stress the fact that this simplified tab has been developed as a fall back option and that it does not strictly follow CEIOPS specification regarding the segmentation of portfolios for the risk margin calculation. ***However, CEA believes it is a valid approach to encourage participation on a 'best effort' basis.***
- 1.12 This spreadsheet is made available on the CEA website and the following section provides guidance on how to use the additional sheets.
- 1.13 There is evidence that CEIOPS will listen to arguments from the industry provided that these are built on economic reasoning and the messages are consistent from the different parts of the industry.

The CEA will continue to work with CEIOPS on the cost of capital approach based on the feedback received from the industry

2. Description Spreadsheet

Introduction

2.1 CEA has added five additional tabs (or sheets) within the spreadsheet that serve different purposes:

- The CEA helper tab, called « VI.A.1 CoC RM CEA » which follows the same structure as CEIOPS helper tab but incorporating the possibility of diversification and of excluding market and premium risk for $t=1$
- The CEA simplified tab, called « VI.A.2 CoC RM CEA simplified » which mimics the calculation structure used in QIS2 and that has been adapted to the QIS3 structure. It is the fallback option, to encourage participation on a 'best effort basis' by as many companies as possible
- « VI.B.1 NL Reserve only risk » Auxiliary sheet for calculating reserve underwriting risk for Non Life companies in isolation. No input required.
- « VI.B.2 No Diversification_Matrix » Auxiliary sheet. No input required.
- « VI.C.1 CoC RM Differences » Compares the results of the three ways of doing the risk margin calculation (CEIOPS helper, CEA helper and CEA simplified solution)

A new section has been created (VI) under the index sheet to reference all these four tabs. This section **does not** form part of the CEIOPS package and has been added by the CEA with the purposes stated above.

A more detailed description of the additional tabs is provided below.

Description of the CEA helper tab « VI.A.1 CoC RM CEA »

Description of sheet and outcomes

2.2 The CEA helper tab calculates the market value margin, using the same basic approach as CEIOPS. The difference is that several options are built in, which gives the user the flexibility to allow for diversification between the lines of business and to exclude premium risk and market risk at $t=1$.

2.3 The underlying calculations required may appear complex but the sheet only requires minimum input by the user which is clearly identified (see below), actually making the spreadsheet relatively easy to use. The required inputs are:

- Step 1 : Choose the select criteria regarding currency, use of diversification and inclusion at $t=1$ of market and premium risks (CELLS F8 :F11)
- Step 2 : Input the run-off patterns (Follow link in F15)

The rest of the spread sheet contains the necessary calculations and require no user input

2.4 The outcome of the total risk margin can be found in cell H23 and the output by line of business can be found in cells I23-AB23.

STEP 1: Switches giving the user flexibility

2.5 The sheet has four switches. The 1st switch (F8) requests the currency which is applied for the calculations. This is required to determine which interest rate yield curve needs to be applied in the calculations.

2.6 The 2nd switch (cell F9) provides the user the possibility to allow for diversification across the different lines of business. The correlation assumptions we have assumed for $t=0$, $t=1$, $t=2$, ... are set equal to the correlations provided by CEIOPS in the technical specification. For practicality reasons we have assumed that the correlations will be constant over time. In the calculations, the diversification benefits are calculated for each time period separately, since it is expected that the mix of risks will vary significantly over time.

2.7 The 3rd switch (cell F10) provides the user the possibility to not to take into consideration the premium risk at $t=1$.

2.8 The 4th switch (cell F11) provides the user the possibility to not to take into consideration market risk at $t=1$.

STEP 2: Required inputs

2.9 Consistent with the sheet of CEIOPS « V.A.4 CoC Risk margin » the run-off pattern of the relevant risk drivers is requested for both life and non-life business. These are expressed as a percentage of the relevant risk driver at $t=0$ and input in cells F98-AB146.

Description of the CEA simplified tab « VI.A.2 CoC RM CEA simplified »

Description of sheet and outcomes

2.10 The CEA simplified tab identifies four different steps to calculate the risk margin. The four steps in the calculation are the following:

- Step 1 : Calculation of the SCR for the purpose of the CoC calculation at $t=0$
- Step 2 : Calculation of the SCR for the purpose of the CoC calculation at $t=1, t=2, t=3, \dots$
- Step 3 : Calculation of the projected capital charges at $t=1, t=2, t=3, \dots$
- Step 4 : Calculation of the present value of the capital charges

2.11 For steps 2 to 4, there are 2 alternatives provided, so that the sheet produces two different outcomes (cell F221 and cell D237).

- Alternative 1 : the user is asked to specify the best estimate of the technical provisions for each year until the liabilities have run-off.
- Alternative 2 : the user can use a simplified duration approach to calculate the run-off pattern of the technical provisions.

2.12 It is not necessary to do the calculations using both alternatives. The 2nd alternative, which is less accurate, is only recommended if the user cannot provide the run-off pattern of the technical provisions as is requested in the 1st alternative.

Required inputs

2.13 In the first alternative, the user is asked to specify the best estimate of the technical provisions for each year until the liabilities have run-off (cell D60-D109). In the second alternative, the user is asked to input an assumed duration (cell D229) and a flat discount rate in (cell D230).

Switches giving the user flexibility

2.14 In the simplified sheet, the user also has the possibility to allow for diversification between the lines of business and in addition to exclude premium risk and market risk at $t=1$, by means of switches.

2.15 The 1st switch (cell D7) requests the currency which is applied for the calculations. This is required to determine which interest rate yield curve needs to be applied in the calculations.

2.16 The 2nd switch (cell D8) provides the user the possibility to allow for diversification across the different lines of business.

2.17 The 3rd switch (cell D9) provides the user the possibility to not to take into consideration the premium risk at $t=1$.

2.18 The 4th switch (cell D10) provides the user the possibility to not to take into consideration market risk at $t=1$.

Comparing the different outcomes in sheet « VI.C.1 CoC RM Differences »

2.19 The sheet « VI.C.1 CoC RM Differences » compares the results of the three ways of doing the risk margin calculation:

- The method applied in the sheet of CEIOPS, sheet « V.A.4 CoC Risk margin »
- The method applied in the CEA helper tab, sheet « VI.A.1 CoC RM CEA »
- The method applied in the CEA simplified tab, sheet « VI.A.1 CoC RM CEA simplified » . Here the answers of both alternatives are provided.

2.20 Dependent on whether the switches are turned on or off, you can see the impact of changing the assumptions. The answer of the CEA helper tab should provide the same outcome as the answer of the CEIOPS tab, if no diversification across the lines of business is assumed and if in addition market risk and premium risk are included at $t=1$.