CEIOPS-FS-08/06

24 May 2006

QIS2 spreadsheet instructions

This version replaces the version previously published at CEIOPS' website.

Overview

1. For this second Quantitative Impact Study (QIS), CEIOPS has developed a QIS2 package, which includes a cover note, a spreadsheet accompanied by technical specifications and spreadsheet instructions and term structures, and a questionnaire of additional information requests. Thus, like the first QIS, QIS2 requests both quantitative and qualitative information. The technical specifications provide core information about the relevant principles and how to perform the calculations for this QIS. The spreadsheet and these instructions focus on the quantitative data requests. This document explains the spreadsheet design, gives instructions on how to fill in the data, and points out the relevant reference paragraphs in the technical specifications.

The Excel file comprises the following sheets:

Read Me
0. Index
I.1 General information
I.2 Term structure (if different from default)
I.3 EEA-wide parameters
I.4 Country (specific) parameters
II.1 SCR overview
II.2 MCR overview
II.3 MCR transitional

II.4 Market risk

II.5 Credit risk

II.6 Life underwriting risk

II.7 Health underwriting risk

II.8 Non-life underwriting risk

II.9 MCR non-life underwriting (risk)

II.10 Operational risk

III.1 Balance sheets

III.2 Summary (of) technical provisions

IV. Risk groups for life, health and non-life (4+1+11 sheets)

2. It is expected that an insurance undertaking only reports one spreadsheet to its national supervisor. If the undertaking is active in both life and non-life, it is requested to report on both activities in the corresponding tab pages of the spreadsheet. If the technical provisions contain both life and non-life elements, it is requested to split the report of the life and non-life sheets on the corresponding basis.

3. The print areas of spreadsheets have been partially locked to control input errors.

Read Me

4. The Read Me sheet explains the color and style conventions that have been used to facilitate the filling in of the spreadsheets. In particular the Input cells are in light blue, and §Number cells refer to a specific paragraph in the technical specifications while §A.Number refers to the questionnare (additional information requests).

Index (sheet 0)

5. The index sheet gives an overview of the spreadsheet design and lists the names of all the sheets comprising the Excel file. Click on a name to switch to the corresponding sheet.

General information (sheet I.1)

6. This sheet collects some general information of the participant and of the input data (eg reporting basis, date and currency) and discounting method used (prescribed or other term structure or a duration approach as a fall-back option, see below and Annex A).

Term structure (sheet I.2)

7. If the cashflows are discounted using a term structure different from the one prescribed by CEIOPS, the participant is requested to provide here the term structure used.

8. CEIOPS provides, if market data is available, a full term structure for all EEA-countries, together with the US dollar, Japanese yen and Swiss franc. Where the given rate structure provides no data for a duration, the interest rate should be interpolated in a suitable fashion. Obligations denominated currencies other than the ones for which CEIOPS provided term structures should be discounted with an appropriate term structure to be determined by the insurance undertaking.

9. It is recognised that the term structure data provided is not a risk-free term structure, but this has been deemed adequate for the purpose of QIS2. It also enhances the comparability with QIS1 results for those undertakings that elect to use end of year 2004 data.

EEA-wide parameters (sheet I.3)

10. This sheet includes a list of the prescribed life and non-life business segments and the EEA-wide calculation parameters for QIS2. The corresponding paragraph of technical specifications is mentioned for each parameter.

Country specific parameters (sheet I.4)

11. This sheet includes those QIS2 parameters that are defined at national level for health and non-life insurance.

SCR overview (sheet II.1)

12. Key results of the QIS2 SCR calculations are collected here (this sheet focuses on the placeholder approach, but the alternative calculations will also be used when analysing the results). Color indicates the type of each cell (the light blue cells are to be filled in). Eligible elements of capital according to Solvency I are adjusted to take into account any hidden reserves and deficits as explained in §4.2. For certain with-profit life insurance policies a 'k-factor' may be used as a risk absorbing element under the conditions discussed in §4.3 and §5.14-19. For non-life insurance an adjustment is made for next year's expected profit or loss as desribed in §5.11-13 and in §5.20-29 (this information is given on sheet II.8).

13. A correlation matrix for the different SCR modules should be estimated by the participant as explained in §5.33. Alternatively SCR can be calculated using the SST cost of capital approach (§3.3-5), or additionally with another method (§3.6-7), or with an internal model (§6.2). The best estimate technical provisions should be used as a basis for the cost of capital calculation as explained in §5.9. For segmentation please see §3.8.

14. Additional information request number §A.12 should also be reported here.

MCR overview (sheet II.2, §7)

15. Minimum Capital Requirement MCR will be calculated in two ways in QIS2, and this sheet gives the results of both of these approaches, although it focuses mainly on the SCR-based method. This 'post transition MCR' is calculated in a similar way as the SCR except that some of the parameters are calibrated differently, and operational risk is not included. As input data

an estimate of additional run-off expenses is requested, see additional information request §A.35.

MCR transitional (sheet II.3, §7.3-7.12)

16. Another approach, so-called transitional MCR, is based on Solvency I rules. On this sheet the relevant current Solvency I items are requested to calculate the life insurance MCR for QIS2, while in non-life insurance the only adjustment needed is a multiplication by 50 %. However, also non-adjusted (100%) figures are calculated.

Market risk [sheet II.4, §5.37 – 5.67]

17. The participant is requested to calculate the following four sub-categories of market risk: interest rate risk, equity risk, property risk and currency risk. For each risk category, the undertaking should calculate the risk according to the simpler factor-based method and the relatively more advanced scenario-based method. The SCR for market risk is calculated according to the formula described in §5.39.

18. For the interest rate sub-risk, the scenario-based approach is the placeholder. For all other market risk sub-risks, the placeholder is the factor-based approach.

19. On a voluntary basis the market risk result based on the participant's internal model may be communicated (§6.2).

20. On the market risk sheet, references are made to 'NAV'. This stands for the net asset value, i.e. assets minus liabilities. 'ΔNAV' refers to the change in net asset value.

21. The effect of a 'combined scenario' where the equity and interest rate shocks described in the equity and interest rate sub-risks occur simultaneously,

asked for in §A.27, may be entered in the section 'additional information requested' of this sheet.

Interest rate risk

22. This section of the sheets asks for the interest rate risk calculated according to the factor-based and scenario-based methods as described in the QIS2 specification. The formulas are described in §5.43-§5.49.

23. For both the factor and scenario approach, the total result equals the lowest outcome of zero, the upward stress result and the downward stress result, multiplied by minus one. In other words, the result equals the *absolute value of the greatest negative change*.

24. For the factor-based approach, if the participant uses one of the approximation methods given in §5.47 and §5.48, it should be stated which of the two methods is used. This can be done by selecting the appropriate method from the drop-down menu of the excel sheet, next to the cell named 'Factor method used'. The results of the calculations should be entered into the left-hand table named 'Stressed factors duration'.

25. For the scenario-based approach the results of the calculations should be entered into the right-hand table named 'Stress scenario'. The upward and downward stress results for fixed income and liabilities should be given so that the risk result is calculated automatically. If the participant can only give the total change in net asset value, the up and down stress result columns should be left empty and the result should be entered into the bottom two 'total' cells H12 and I12.

26. Additionally, information is requested on the factor-based MCR for interest risk. The formulas underlying the calculations can be found in §7.21 of the specification document.

27. Participants should provide the weighted average volatility on each of the five groups of their bond portfolio specified in §A.28:

- Bonds corresponding to non-life technical provisions
- Bonds backing life insurance contracts with no participating profit clauses for policyholders
- Bonds corresponding to participating (with-profits) life contracts
- Bonds allocated to policies where the policyholder bears the investment risk
- Bonds allocated to the insurer's own funds

Equity risk

28. This section of the sheets asks for the equity risk calculated according to the factor-based and scenario-based methods as described in the QIS2 specification. The formula for the factor-based approach is located in §5.53 and the formula for the scenario-based approach is located in §5.54.

29. For the factor-based approach, please enter the market value of the overall equity exposure after the event in the cell labelled 'After event'. The final result, which is calculated automatically, is the absolute value of the change in the market value of the overall equity exposure (net of business where the policyholder bears the investment risk) if it is negative, and zero otherwise.

30. For the scenario-based approach, please enter the change in net asset value (ΔNAV) in the cell labelled 'ΔNAV'. The final result, which is calculated automatically, is the absolute value of ΔNAV if it is negative, and zero otherwise.

31. Participants should provide the weighted average volatility on each of the five groups of their equity portfolio specified in §A.29:

- Equities corresponding to non-life technical provisions

- Equities backing life insurance contracts with no participating profit clauses for policyholders
- Equities corresponding to participating (with-profits) life contracts
- Equities allocated to policies where the policyholder bears the investment risk
- Equities allocated to the insurer's own funds

Property risk

32. This section of the sheets asks for the property risk calculated according to the factor-based and scenario-based methods as described in the QIS2 specification. The formulas are located in §5.59 and §5.60, respectively.

33. For reasons of simplicity, the participant is not required to make a distinction between direct and indirect real estate or between different types of real estate investment.

34. For the scenario-based approach, please enter the change in net asset value (ΔNAV) in the cell labelled ΔNAV. The final result, which is calculated automatically, is the absolute value of ΔNAV if it is negative, and zero otherwise.

Currency risk

35. This section of the sheets asks for the currency risk calculated according to the factor-based and scenario-based methods as described in the QIS2 specification. The formula for the factor-based approach is located in §5.65 and the formula for the scenario-base approach is located in §5.66.

36. For each currency other than the local currency, the currency position is the difference in the technical provisions for liabilities in that currency and the assets in that currency (§5.64).

37. For the scenario-based approach, please enter the change in net asset value (ΔNAV) in the cell labelled ΔNAV. The final result, which is calculated automatically, is the absolute value of ΔNAV if it is negative, and zero otherwise.

Credit risk [sheet II.5, §5.68 - 5.75]

38. In this section the undertaking is asked to provide information on the credit risk for all exposures.

39. The ratings and credit spreads requested are the ratings and spreads at the reporting reference date.

40. The participant is asked to provide the total credit risk exposure using the ratings based approach. The formula for the ratings-based approach is located in §5.72. The exposures net of collateral and any other risk mitigants (§5.73) should be entered per ratings bucket in the column called 'Exposures'. Other risks arising from the credit risk mitigants should be entered into the column called 'Mitigant risk' (§5.74).

41. On a voluntary basis the credit risk result based on the participant's internal model may be communicated (§6.2).

42. If an exposure has more than one rating from different credit rating agencies, the participant should apply the CEIOPS rating bucket corresponding to the second highest rating (i.e., the second lowest risk weight). If an exposure to a non-reinsurer is unrated the participant should apply CEIOPS rating bucket VIII.

43. Currently CEIOPS has no guidance as to ratings from which credit rating agencies qualify for use in the ratings-based approach. The national supervisor may provide further guidance on this subject.

44. For reinsurers the participant is asked to consider the net exposure. If a reinsurer is unrated, the participant should apply CEIOPS rating bucket IV if the reinsurer would be subject to the requirements of the Reinsurance Directive, including supervision by an EEA competent authority, and CEIOPS rating bucket VI otherwise.

45. The participant is asked in the qualitative questionnaire (§A.30) to fill out the two matrices for non-reinsurance credit risk exposures and reinsurance credit risk exposures, respectively. Each cell gives a combination of a duration bucket and a ratings bucket and should contain the total cash delta, measured as the aggregate of the market value times the duration of each exposure in the cell.

46. The participant is also asked in the qualitative questionnaire (§A.31) to fill out the matrix for the five largest non-reinsurance exposures (net of collateral) for each duration bucket and ratings bucket combination. In the same question, the undertaking is asked to disclose in respect of the largest reinsurance exposure its size expressed as a proportion of the total reinsurance exposures (net of collateral), the relevant rating bucket, and its duration.

47. Finally for credit risk, the undertaking is asked in §A.32 to disclose in respect to its total exposures to reinsurers that are covered by collateral, the total value of posted collateral held on the balance sheet and the total value of collateral carried off balance sheet.

Life underwriting risk [sheet II.6, §5.76 - 5.131]

48. For life insurance contracts the SCR underwriting risk charge consists of four biometric risks (§5.77-5.121), lapse risk (§5.122-5.126) and expense risk (§5.127-5.131). The placeholder approach uses factor-based risk charges, which are combined using the pre-specified correlations of §5.79, but each calculation is also requested on a scenario-basis. Therefore the relevant

volume-measure inputs and the results of scenarios are requested in the light blue cells of this sheet. Also some additional information is requested for three combined scenarios, see question §A.33.

49. Life biometric risk consists of mortality (§5.81-5.91), longevity (§5.92-5.101), morbidity (§5.102-5.111) and disability (§5.112-5.121) components. Moreover it is sub-divided into volatility, uncertainty and CAT parts. The placeholder result is calculated according to the factor formulas. Scenario alternatives also given for each biometric risk charge. The same prioritisation between factor-based and scenario approaches applies also to lapse risk and to expense risk.

50. Here again on voluntary basis the corresponding results based on participant's internal model may be communicated (§6).

Health underwriting risk (sheet II.7, §5.132-147)

51. Health underwriting risk is split into three subrisks:
    - expense risk;
    - excessive loss / cancellation / mortality risk; and
    - epidemic/accumulation risk.

    The spreadsheet is divided into three sections, each dealing with one of the risks.

Expense risk

52. Based on the input data
    - earned gross premiums in health insurance of the accounting year; and
    - for each of the last ten years the ratio of expense result to earned gross premiums;

    the SCR of the expense subrisk is calculated according to the formula described in §5.139. Intermediate results of the calculation are also shown.

Excessive loss / cancellation / mortality risk

53. From the input data

- earned gross premiums in health insurance of the accounting year; and
- for each of the last ten years the ratio of risk result to earned gross premiums;

the SCR for the excessive loss/cancellation/mortality risk is determined according to the formula described in §5.143. Intermediate results of the calculation are also shown.

Epidemic/accumulation risk

54. Based on the earned gross premiums of the participant in health insurance of the accounting year, the SCR for epidemic/accumulation risk is determined according to the formula described in §5.146.

55. Optionally, an internal model estimate of the health underwriting SCR can be entered. Please consult section 6 of the QIS2 specification for more information.

Non-life underwriting risk (sheet II.8, §5.148-188)

56. Non-life underwriting risk is split into three components: reserve risk, premium risk and CAT risk.

Premium risk

57. From input data provided in the non-life technical provision sheets IV.6-IV.16, the placeholder SCR for premium risk and the alternative SCR for premium risk are determined according to the formulae stated in §5.153-5.168. Several intermediate results are also shown.

Reserve risk

58. No entry needs to be made for reserve risk. Based on the net and gross provisions for claims outstanding, the risk margin of the net provision, and the part of the net provision that is expected to be paid out in the forthcoming year taken from the sheets on non-life technical provisions, the

SCR for reserve risk and the volatility-related part of the reserve risk SCR is determined according to the formulas specified in §5.169-5.177.

CAT risk

59. [To be completed by the national regulator]

60. Additionally, the participant may provide an internal estimate on the non-life underwriting risk (§6.2).

Additional information requests

61. Answers to the additional information request §A.19 can be provided at the bottom of the sheet.

MCR non-life underwriting risk (sheet II.9, §7.27–30)

62. Also regarding the Minimum Capital Requirement, non-life underwriting risk is split into the three components reserve risk, premium risk and CAT risk.

63. No entries need to be made in this sheet. The MCR is calculated from input data provided in the non-life technical provision sheets according to the description in §7.27-30.

Operational risk [sheet II.10, §5.189 – 5.192]

64. In this section the undertaking is asked to provide information on operational risk, defined as the risk of loss arising from inadequate or failed internal processes, people, systems or from external events.

65. The specification asks for the operational risk according to a simple, robust formula (§5.191).

66. The participant is asked to fill in all fields of the input information, according to §5.190 of the specification, to the best of their ability.

67. The participant may provide an internal estimate on the operational risk category (§6.2).

68. For the six yes/no questions on operational risk in the qualitative questionnaire (§A.20), please select the appropriate answers here.

Balance sheets (sheet III.1, §2, and §4)

Balance sheets

69. In the first section of the sheet, three balance sheets should be entered:
    - The balance sheet according to the current bases;
    - The balance sheet according to the current bases, allowing for modifications according to the Solvency I definition of available capital; and
    - The balance sheet according to section 2 of the QIS2 Technical Specification.

70. In the second section of the sheet, more detailed information on the insurance liabilities and the assets according to the QIS2 valuation principles should be provided.

Balance sheet according to current bases

71. In the first balance sheet, assets and liabilities according to local accounting regulations should be provided. The segmentation of assets and liabilities should be in line with the accounting directive (91/674/EEC), with the following exceptions:
    - The asset items 'subscribed capital unpaid', 'intangible assets', 'debtors' and 'other assets' of the Accounting Directive segmentation are summarised to the item 'other assets'.
    - The liability items 'subordinated liabilities', 'provisions for other risks and charges', 'deposits received from reinsurers', 'creditors' and 'accruals and deferred income' are summarised to the item 'other liabilities'.

- The reinsurance amount of the technical provisions should not be deducted from the technical provisions, but entered in the balance sheet as an asset (Reinsurance).

Balance sheet according to Solvency I

72. The second balance sheet should coincide with the first balance sheet apart from modifications to assets and liabilities according to the Solvency I definition of available capital. The current directives[1] define changes to capital and reserves to arrive at the available solvency margin. These changes should also be reflected in the assets and liabilities. Two examples:
    - Intangible assets are deducted from the capital and reserves to derive the available solvency margin. Likewise, they should be deducted from the current bases assets to derive the Solvency I assets.
    - Under certain conditions, subordinated loan capital may be added to capital and reserves to derive the available solvency margin. Likewise under these conditions, they should be deducted from the remaining liabilities to derive the Solvency I liabilities.

    The national supervisor may give guidance on the necessary modifications.

Balance sheet according to QIS2

73. The third balance sheet coincides with the second balance sheet apart from the changes to the available solvency margin described in section four of the QIS2 Technical Specification. These changes should also be reflected in the assets and remaining liabilities.

Insurance liabilities

74. Technical provisions gross and net of reinsurance according to current bases, Solvency I bases and QIS2 valuation principles should be provided.

[1] Cf. Article 27 of Directive 2002/83/EC for life insurance and Directive 2002/13/EC for non-life insurance.

Investments

75. The investment assets are segmented according to the following segmentation

- Land and buildings
- Investments in affiliated undertakings and participating interests
- Bonds
- Equities
- Other

Land and buildings, bonds and equities in funds should be reported under the corresponding segments if the information is available. Else they should be reported under 'other'.

76. Please consult §2.4 for information on the market valuation.

QIS2 Summary of technical provisions (sheet III.2, §2 and §3)

77. The sheet gives an overview of the gross life and non-life technical provisions of the participant provided in the sheets IV1 – IV.16.

78. Additionally, estimates of the total technical provisions allowing for diversification effects between the segments and lines of business can be entered (cf. §2.11 and §3.8). Also the total technical provisions according to the cost of capital approach can be provided in this sheet.

Risk groups [sheets IV.1-16, §2.5 – 2.43]

Life insurance [sheets IV.1-4, §2.5 - 2.32]

79. On the sheets IV.1 – IV.4 corresponding to the life insurance risk groups 1–4, it is requested to provide information about the technical provisions under current bases and the technical provisions according to the QIS specification in §2.

80. In the first table it is requested to report the value of the liabilities on current bases according to the QIS2 general segmentation (i.e. contracts with

participation clauses, linked business, other than health contracts without profit participation, reinsurance. Note that the sheet is similar for all segments and therefore some input cells may not be always relevant.) Additionally, deferred acquisition costs are asked in order to better compare current and QIS2 valuation. If there are also other balance sheet items that might have significant impact on the comparability of valuation of liabilities, please ask your national supervisor how to deal with them.

81. Subsequently, the insurer is asked to report on the value of best estimate technical provisions including the guaranteed or otherwise statutory values (§2.13-32) and discretionary benefits (§2.28-31), and also without the profit-sharing part. This calls for using realistic assumptions and discounting the cash flows either using the full term structure (default option), or the duration approach (cf. Annex A). Technical provisions that correspond to the 75^{th} percentile of non-hedgeable risks are then disclosed similarly (§2.5, 2.12, 2.38-39). All these values should be reported both gross and net of reinsurance.

82. As background information please provide the following data:
- the percentage of current provisions that you have calculated according to the QIS2 specification
- the amount (in %) of discretionary future bonuses that can be used to cover general losses (§2.31 and 4.4)
- the market value of hedgeable risks in the best estimate (§2.5, 2.12)
- half of the standard deviation of risk margin (§2.40)
- the sum of current surrender values on a contract-by-contract basis (§2.42)

83. In addition this sheet includes input cells for the technical provisions based on the benchmark cost of capital approach to the risk margin (the Swiss Solvency Test, SST), and a supplementary own approach, as discussed in §3.

Health insurance [sheet IV.5, §2 and §3]

84. On the sheet IV.5, it is requested to provide information about the technical provisions of health insurance with features similar to life business (cf. §2.9). The design of the sheet and the sheets for life insurance coincide. Please consult the above paragraphs on life insurance for instruction.

Non-life insurance [sheets IV.6-16, §2 and §3]

85. The sheets IV.6 to IV.16 refer to the technical provision of each line of business according to the following segmentation:

1. Accident and health (non-life insurance)
2. Motor, third party liability
3. Motor, other classes
4. Marine, aviation and transport
5. Fire and other damage of property
6. Third-party liability
7. Credit and surety ship
8. Legal expenses
9. Assistance
10. Miscellaneous non-life insurance
11. Reinsurance

86. Each sheet is divided into four sections. The first section deals with the technical provisions on the current basis. The second section deals with the technical provisions according to section 2 of the QIS2 Technical Specification. The third section deals with additional information on technical provisions and profit and loss information used for MCR and SCR calculations. The fourth section refers to the additional information requests. Additionally, the cost of capital provisions according to section 3 of the QIS 2 Technical specification can be entered in the sheets.

Technical provisions on the current basis

87. This part of the sheets asks for the technical provisions according to the current national regulation for annual accounts. Participants should fill in the following information about technical provisions held on the current basis, both gross and net of reinsurance:

1. Provision for unearned premiums
2. Claims outstanding
3. Provision for bonuses and rebates
4. Equalisation provision
5. Other technical provisions
6. thereof: provision for unexpired risk

88. Apart from the provision for unexpired risk, this classification follows from Article 6 of the Accounting Directive 91/674/EEC.

89. In case the "Other technical provisions" contain a provision for unexpired risks, the value of this item should be shown separately.

90. Additionally, deferred acquisition costs are asked in order to better compare current and QIS2 valuation. If there are also other balance sheet items that might have significant impact on the comparability of valuation of liabilities, please ask your national supervisor how to deal with them.

Technical provisions according to the QIS2 Technical Specification

91. This section of the sheets asks for the technical provisions calculated according to the QIS2 Technical Specification. The section differentiates between

- the level of confidence:
  - Best estimate
  - 75^{th} percentile

- the type of technical provision:
  - Premium provisions
  - Provision for claims outstanding
- the ways to allow for reinsurance:
  - gross of reinsurance
  - net of reinsurance
- the way to allow for discounting:
  - discounted
  - undiscounted

Please refer to section 2 of the QIS2 Technical Specification for the principles of the calculation.

92. The spreadsheets refer to the Best estimate and the 75th percentile of the Premium provision. The Premium provisions consist of the Provision for unearned premiums and the Provision for unexpired risks. When calculating these values the stochastic nature of the unexpired risk should be taken into account, whereas the unearned premiums should be considered as a deterministic value.

93. In the sheets IV.6 to IV.16 the technical provisions of the line of business should not allow for diversification between different lines of business. (I.e. such diversification effects should not be allocated to the single lines of business.) If a participant is able to take the diversification effects into account, the resulting total value of the technical provisions can be given in sheet III.2.

94. In the sheets IV.6 to IV.16 the technical provisions net of reinsurance should not allow for the possibility of the reinsurer's default.

95. If the participant has calculated the risk margin according to the cost of capital approach outlined in section 3 of the QIS2 Technical Specification,

please report the technical provisions incorporating this risk margin for each homogenous risk group

96. As background information, participants may provide
    - the percentage of current bases technical provisions current that are valued according to the QIS2 valuation principles laid out in §2;
    - half the standard deviation of the cash flow distribution (cf. §2.40); and an estimate of the modified duration of the best estimate claims provision cash flow.

Profit and loss information

97. In this section, participants are requested to provide additional profit and loss information used for MCR and SCR calculations:
    - the written premiums of the accounting year (cf. §5.180);
    - estimations on the gross and net earned premiums of the next year, used in the calculation of premium risk SCR and MCR (cf. §5.154);
    - an estimation of the proportion of the claims provision that is paid out in the forthcoming year (cf. §5.27);
    - information on reinsurance, used in the calculation of CAT risk SCR and MCR (cf. §5.180); please note that the national regulator specifies whether the information is needed; and
    - time series of combined ratios and premiums, used in the determination of the premium risk SCR and MCR (cf. §5.154).

Additional information requests

98. In this section answers to the additional information request §A34 can be provided.

Annex A: The duration approach

1. In principle, the technical provisions should be discounted as described in the QIS2 specification (cf. §2.16). In case an insurer is not able to discount the cash flows with the full term structure, it may apply the duration approach.

2. Under the duration approach, the undertaking discounts the insurance liability cash flow with a fixed discount rate. This discount rate should be the interest rate from the given term structure that corresponds to the average expected duration of the segment or line of business.

3. The idea is as follows: each segment or line of business in the portfolio of liabilities, consisting of various cash flows and associated maturities, is regarded notionally as a single cash flow at a single moment corresponding to the average duration of the these cash flows. The appropriate spot rate of interest corresponding to this duration can then be established from the provided term structure spreadsheet. Discounting the original liabilities portfolio using this spot rate of interest then provides the approximation required for the expected value.

Annex B: Excerpts from the Accounting directive 91/674/EEC

The accounting directive describes the relevant items of the balance sheet. In this Annex, the sclassification of the technical provisions is summarized, including excerpts from the original wording from the directive.

C. Technical provisions

1. Provision for unearned premiums

   The provision for unearned premium shall comprise the amount representing that part of gross premiums written which is to be allocated to the following financial year or to subsequent financial years.

   a. Gross amount
   b. Reinsurance

2. Life assurance provision

   The life assurance provision shall comprise the actuarially estimated value of an insurance undertaking's liabilities including bonuses already declared and after deducting the actuarial value of future premiums.

   a. Gross amount
   b. Reinsurance

3. Claims outstanding

   The provision for claims outstanding shall be the total estimated ultimate cost to an insurance undertaking of settling all claims arising from events which have occurred up to the end of the financial year, whether reported or not, less amounts already paid in respect of such claims.

   a. Gross amount
   b. Reinsurance

4. Provision for bonuses and rebates

   The provision for bonuses and rebates shall comprise amounts intended for policyholders or contract beneficiaries by way of bonuses and rebates as defined in Article 39 to the extent that such amounts have not been credited to policyholders or contract beneficiaries or included in Fund for future appropriations.

   a. Gross amount
   b. Reinsurance

5. Equalization provision

The equalization provisions shall comprise any amounts set aside in compliance with legal or administrative requirements to equalize fluctuations in loss ratios in future years or to provide for special risks

6. Other technical provisions

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

a. Gross amount
b. Reinsurance

D. Technical provisions for life assurance policies where the investment risk is borne by the policyholders

This item shall comprise technical provisions constituted to cover liabilities relating to investment in the context of life assurance policies the value of or the return on which is determined by reference to investments for which the policyholder bears the risk, or by reference to an index. Any additional technical provisions constituted to cover death risiks, operating expenses or other risks (such as benefits payable at the maturity date or guaranteed surrender values) shall be shown under item C(2)

a. Gross amount
b. Reinsurance

Annex C: Term structure methodology for Euro-zone

Note that the applied method is similar to the one DNB uses for the Financial Assessment Framework. This annex does not indicate any intention from Ceiops to make this approach the default approach. It is just meant for information purposes in order to understand how Ceiops determines the prescribed Euro term structure for QIS1.

Abstract

The swap curve is constructed from interest rates at which a fixed rate is swapped against the 6-month EURIBOR. Unavailable maturity points are interpolated on the assumption that intervening forward rates are constant. No smoothing of the forward curve will be applied: the zero coupon spot curve has turned out to be very smooth already, and smoothing it will lead to only marginal adjustments.

Underlying principles

In calculating the zero coupon swap curve the following principles are applied. Together, they represent the best practice as found in the literature.

- The swap curve should fit known and reasonably liquid maturity points. This 'no-arbitrage' condition is characteristic of the swap market because trading tends to concentrate around full-year maturities. As this market is highly liquid, contracts are actually traded at the quoted rates (listed by e.g. Bloomberg).
- The emphasis is on a close fit in the long end of the curve. In practice, in order to keep the curve stable (no sawtooth pattern) towards the long end, the forward curve is estimated, from which the spot curve is then derived.
- Interpolations and extrapolations are based on the assumption that forwards are constant.
- It has been decided to adopt a method that is simple and easy to explain and reproduce. This means, among other things, that no smoothing is applied.

Data

The data source underlying the construction of the nominal interest rate term structure wil be the European swap rates for 1–10-year maturities (yearly intervals) and 12, 15, 20, 25, 30, 40 and 50-year maturities as they are listed on a daily basis by Bloomberg. The intervening maturity points up to 30 years and the 35-year and 45-year swap rates will not be used as input values for the time being. Although Bloomberg does list them, the trade in these maturity points has been decidedly less liquid. In such interest rate swaps, 6-month EURIBOR is exchanged for a fixed interest rate. The rate series used will be the 'composite rates' (code: CMPN) in Bloomberg, which may be said to reflect a market average. The curve is based on the (lower) bid rate; Bloomberg shows a 2 basis point bid/offer spread.

Methodology

An interest rate swap can be explained most easily as a long position in a fixed-rate bond combined with a short position in a variable-rate bond, or vice versa. According to market practice, an interest rate swap is constructed so that no initial payment takes place – in other words, its market value is equal to nil. As the underlying variable-rate instrument is by definition traded at par when the swap is entered into, the same must also apply to the underlying fixed-rate instrument. This implies that rates observed in the market are par yields. The interest convention of the fixed-rate side of an ordinary swap is 30/360, meaning that a month is set at 30 days and a year at 360 days. We will define the following (annually accrued) interest rates:

$$
\begin{aligned}
r_t &= \text{(par) swap rate at maturity } t, \\
z_t &= \text{zero coupon swap rate at maturity } t, \\
f_{t1,t2} &= \text{forward rate between } t1 \text{ to } t2
\end{aligned}
$$

The cash flows of the underlying fixed-rate bond included in a t-year swap are as follows:

date (years)	1	2	...	$t-1$	t
cash flow	r_t	r_t	...	r_t	$1 + r_t$

The value at the time the swap is made equals 1 (= 100%).

The zero coupon rate is derived from the par swap rate by means of bootstrapping, starting with the 1-year swap rate. Since $(1 + r_1) / (1 + z_1) = 1$, it follows that $z_t = r_1$. The 2-year zero coupon interest is determined by calculating the present value, at the 1- and 2-year zero rate, of the cash flows from (the fixed-rate side of) the 2-year swap, and equating this present value to 1. The 1-year zero rate is already known, so that this leaves an equation with a single unknown (the 2-year zero coupon rate):

$$\frac{r_2}{1+z_1} + \frac{1+r_2}{(1+z_2)^2} = 1,$$

which may be rewritten as:

$$z_2 = \sqrt{\frac{1+r_2}{1-\frac{r_2}{1+z_1}}} - 1.$$

z_3 through z_{10} are derived analogously.

By way of explanation, we also derive the 1-year forward over one year (i.e. the forward interest rate accruing between $t = 1$ and $t = 2$) via:

$$(1+z_2)^2 = (1+z_1)(1+f_{1,2}),$$

and hence:

$$f_{1,2} = \frac{(1+z_2)^2}{(1+z_1)} - 1.$$

From maturities of 10 years onwards, not all Bloomberg swap rates are used. Intervening rates are derived from the 12, 15, 20, 25, 30, 40 and 50 year maturity points. To calculate, for instance, the 21-year swap rate, we need to make an assumption. Here, the assumption is made that the 1-year forward remains constant between 20 and 25 years. This is a reasonable assumption, because the forward rate is actually a prediction about the 1-year rate that will apply 20, 21 etc. years from now. The market is not very likely to take substantially different views on 1-year interest rates 20 or 21 years forward. Now, based on the assumption that $f_{20,21} = f_{21,22} = f_{22,23} = f_{23,24} = f_{24,25} = f_{20,25}$, we may write the 21-, 22-, 23-, 24- and 25-year zero rates as, respectively,

$$(1+z_{21})^{21} = (1+z_{20})^{20}(1+f_{20,21}) = (1+z_{20})^{20}(1+f_{20,25}),$$

$$(1+z_{22})^{22} = (1+z_{21})^{21}(1+f_{21,22}) = (1+z_{20})^{20}(1+f_{20,25})^2,$$

$$(1+z_{23})^{23} = (1+z_{22})^{22}(1+f_{22,23}) = (1+z_{20})^{20}(1+f_{20,25})^3,$$

$$(1+z_{24})^{24} = (1+z_{23})^{23}(1+f_{23,24}) = (1+z_{20})^{20}(1+f_{20,25})^4,$$

$$(1+z_{25})^{25} = (1+z_{24})^{24}(1+f_{24,25}) = (1+z_{20})^{20}(1+f_{20,25})^5.$$

And consequently, we may formulate the present value of the 25-year swap as:

$$\frac{r_{25}}{1+z_1} + \frac{r_{25}}{(1+z_2)^2} + \ldots + \frac{r_{25}}{(1+z_{24})^{24}} + \frac{1+r_{25}}{(1+z_{25})^{25}}$$
$$= r_{25}\left[\sum_{t=1}^{20}\frac{1}{(1+z_t)^t} + \frac{1}{(1+z_{20})^{20}}\sum_{t=1}^{5}\frac{1}{(1+f_{20,25})^t}\right] + \frac{1}{(1+z_{20})^{20}(1+f_{20,25})^5} = 1.$$

A numerical procedure is needed to solve for $f_{20,25}$. Substitution of the result in the above equations will yield z_{21} through z_{25}.

For other maturities, the calculation is analogous. For points beyond 30 years, the 1-year forward is assumed to remain constant for 10 years from 30 to 40 years and again from 40 to 50 years. The assumption of a constant forward rate may also be used in extrapolating beyond 50 years. Based on this latter forward rate, we may calculate spot rates for very long maturities.

No smoothing

The forward curve will not be smoothed, for several reasons. The principal reason is that forward in the long end are already fairly constant, so that smoothing would lead to only marginal adjustments in the spot curve. Differences between the 45-year spot rate as produced by a sophisticated tension spline method and that resulting from a constant forward assumption based on given 40- and 50 year rates tend to be extremely small. Furthermore, as has been noted above, the spot curve itself is already very smooth, even though the forward shows discrete jumps. As a final remark, certain smoothing techniques may lead to 'better' valuation in the shorter end of the curve, but may cause instability in the long end. Because the main focus is on the longer maturities, the drawbacks of smoothing outweigh the benefits. Moreover, the non-smoothing method is easier to understand and therefore more transparent.

No discount

The bulk of the swap market is now collateralised, meaning that the moment the market value of a swap becomes negative (and hence positive to the counterparty), margin is pledged. This mechanism *de facto* almost eliminates credit risk. Because differences between the swap curve and government bond rates are driven in part by scarcity effects, they cannot be interpreted unequivocally as a measure of credit risk on swaps. For this reason, no discount will be applied vis-à-vis the swap curve.

Other potential refinements

No adjustments were made to take account of coupon days falling on weekends or of leap years. These factors may cause cash flows to be higher than the indicated swap rate. This applies to both the fixed and the variable rate. Because shifting of cash flows by one or two days has the strongest impact on the short end of the curve, the effects of a refinement will be strongest in that end, although still minimal (typically less than 0.1 basis point).

DNB has published the interest rate term structure as produced by the above methodology on its website, http://www.dnb.nl/dnb/pagina.jsp?cid=tcm:12-46272.

Annex D: Term structure methodology for the non Euro-zone

The source that has been used for the prescribed non-Euro termstructures is Datastream: All the Interest Rate Swaps are supplied by the broker Intercapital (ICAP). All the rates are taken at 17:30 London close and the rates are available on Datastream shortly after 18:00.

CALCULATING SWAP RATES USING "SPREAD OVER TREASURIES"

Example: 7th June 1994	US "on the run" treasury details		Swap spread		Swap rate
	Price	Yield	(bid side)		SA A.365
5yr - 6.75% of 5.99	100,29	6,533	27	=	6,803
10yr - 7.25% of 5.04	100-057	6,943	33	=	7,273

To calculate the swap rate, take the yield to maturity of the relevant "on the run" treasury and add the swap spread. This gives the correct rate for the swap, but on a semi-annual Actual.360 basis. Because the normal convention for USD swaps is Annual Actual.360, a conversion is necessary. To calculate the conversion (approximately), use the following formulas:

([1 + 6.803.200!squared - 1) * 100 * 360.365 = 6.824

([1 + 7.275.200!squared - 1) * 100 * 360.365 = 7.304

Currency	Fixed Day Count Basis	Fixed Payment Frequency	Floating Payment/ Reset Frequency
Australian dollar	Act/365	Quarterly/Semi*	Semi-Annual
Austrian schilling	30/360	Annual	Semi-Annual
Belgian franc	Act/365	Annual	Semi-Annual
Canadian dollar	Act/365	Semi-Annual	Semi-Annual
Czech krone	Act/360	Annual	Semi-Annual
Danish krone	30/360	Annual	Semi-Annual
ECU	30/360	Annual	Semi-Annual
Euro	30/360	Annual	Semi-Annual
Finnish markka	30/360	Annual	Semi-Annual
French franc	30/360	Annual	Semi-Annual
German mark	30/360	Annual	Semi-Annual
Hong Kong dollar	Act/365	Quarterly	Quarterly
Indonesian dollar	Act/365	Annual	Semi-Annual
Irish punt	Act/365	Semi-Annual	Semi-Annual
Italian lire	30/360	Annual	Semi-Annual
Japanese yen	Act/365	Semi-Annual	Semi-Annual
Malaysian dollar	Act/365	Annual	Semi-Annual
Netherlands guilder	30/360	Annual	Semi-Annual
Norwegian krone	30/360	Annual	Semi-Annual
Portuguese escudo	30/360	Annual	Semi-Annual
Spanish peseta	30/360	Annual	Semi-Annual
Swedish krona	30/360	Annual	Semi-Annual
Swiss franc	30/360	Annual	Semi-Annual
Thailand dollar	Act/365	Annual	Semi-Annual
UK pound	Act/365	Semi-Annual	Semi-Annual
US dollar	Act/360	Annual	Semi-Annual

*** Quarterly up to 3 Years and Semi-Annual thereafter**

ZERO CURVES

CONTENTS

Historical Swap Rate based Zero Curves from Intercapital DART are available for the following countries:

Country	Start	Country	Start
Australia (AU)	26.04.99	**Japan (JP)**	01.01.98
Belgium (BG)	02.01.98	**Netherlands (NL)**	31.01.97
Canada (CN)	26.04.99	**Norway (NW)**	02.01.98
Denmark (DK)	02.01.98	**Portugal (PT)**	31.01.97
Euro Vs Libor (EL)	05.02.97	**Spain (ES)**	01.01.98
Euro Vs Euribor (EM)	25.02.00	**Sweden (SD)**	02.01.98
Finland (FN)	02.01.98	**Switzerland (SW)**	05.02.97
France (FR)	05.02.97	**United Kingdom (UK)**	05.02.97
Germany (BD)	05.02.97	**United States (US)**	19.03.97
Italy (IT)	03.02.97		

The Zero Curves include zero rates and associated discount factors for each business day for monthly points along the curve up to a maximum of 12Y 8M.
The mnemonic structure for each of the zero rates along the curve is ccyymm, where cc is the Datastream Country Code, y the year and (mm) the month of the required zero rate.
For example, the mnemonic for the 5 year, 3 month Australian zero rate is AU05Y03 and the mnemonic for the Australian spot rate is AU00Y00.
Mnemonic for these rates are always 7 characters.
The discount factor can be obtained using the datatype DS.
The zero yield can be obtained by using the datatype ZY.
Lists containing all the mnemonics for a particular curve are also available.
The mnemonics for the lists are structured as follows:
LccZER where (cc) is the country code.
For example, the list mnemonic for Italy is LITZER.