

Manual for the completion of the QIS5 internal model sheets

Please note that this manual is not part of the formal QIS5 documentation as issued by the European Commission. It is not intended to, and does not replace the QIS5 Technical Specifications or any other part of the QIS5 documentation. The European Commission documentation takes precedence.

The manual is based on the QIS5 spreadsheets from 23rd of August.

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Introduction

1. In the Solvency II regime the Solvency Capital Requirement (SCR) can be calculated using the standard formula, using a full internal model, or using a combination of a partial internal model and the standard formula. Undertakings may use partial internal model for the calculation of the one or more risk modules or sub-modules of the BSCR, operational risk and Adj¹. In addition, partial internal model may be applied to the whole business of undertakings, or only to one or more major business units².
2. According to the QIS5 Technical Specification, undertakings that already use a full or partial internal model should calculate the SCR both with the standard formula and with the internal model. Participants should fulfil the relevant quantitative sheets in the QIS5 solo spreadsheet in order to allow assessing the impact of the use of internal models under Solvency II and the undertakings' capital needs (both solo entities and groups). All documents for the QIS5 exercise are available on the CEIOPS's website: www.ceiops.eu.
3. Data from the spreadsheet will help the European Commission (EC) and CEIOPS to assess the progress of internal modelling through-out Europe and to prepare supervisory authorities and the industry for the approval process of internal models. This is important as many undertakings are already using or developing internal models with a view to applying to use them to calculate regulatory capital.
4. One of the goals of the fifth Quantitative Impact Study for internal models is to collect reliable and comparable quantitative data from partial and full internal models that will be used by undertakings for calculating their SCR. This data will assist CEIOPS in conducting a range of statistical analyses and then providing a possible update of the calibration of the standard formula and its likely impacts on the Solvency II regime.
5. To achieve the mentioned goal CEIOPS has prepared this manual which helps undertakings in the completion of the QIS5 exercise regarding internal models in particular to those undertakings that have not previously taken part in a QIS.
6. **Additionally undertakings should fulfil the internal model qualitative questionnaire.** Insurers are again encouraged to complete these carefully. The whole "internal model package" consists of:
 - 4 sheets in the main spreadsheet (see point 9 of the Manual)
 - Qualitative questionnaire in Word format
 - One sheet in the Qualitative questionnaire in Excel format

¹ Adj. – adjustment for the risk absorbing effect of technical provisions and deferred taxes

² Article 112 (2) of the Solvency II Directive

The QIS5 Internal Model spreadsheet

Structure of the QIS5 Internal Model spreadsheet

7. The spreadsheet is prepared for the following undertakings:
Solo undertakings:
 - which are not part of a group and intending to use an internal model for the solo SCR calculation,
 - which are part of a group and intending to use an internal model for the solo SCR calculation, where this internal model is not a group internal model,
 - which are part of a group and intending to use a group internal model for the solo SCR calculation,Group undertakings:
 - where the group is intending to use a group internal model for the calculation of the group SCR.
8. The spreadsheet is for both undertakings using partial and full internal models.
9. Undertakings calculating SCR by the internal model are asked to indicate this fact in the sheet I.Participant (the cell D18). It will enable to apply the value of risk margin on the basis of the internal model SCR to the further calculations of the solvency position. This value should be provided in the IM. "blank" sheet results (rows 54-59).
10. Sheets related to internal models are the following:
 - IM. Internal Models Results
 - IM. Internal Model Parameters
 - IM "blank" sheet results
 - IM "blank" sheet parameters
11. The spreadsheet uses a colour code for the individual cells:
 - The light blue cells are the input cells.
 - Yellow cells contain the result of intermediate calculations.
 - In white cells there are parameters from standard formula.
 - Purple cells give the final outcome of the relevant calculation.
12. All values should be net (taking into account the adjustment) of loss absorbing capacity of technical provisions and deferred taxes.
13. The next chapter provides a more detailed description of each of the sheets.

Completing the QIS5 solo spreadsheet

14. This chapter describes in more detail the way in which the internal models sheets should be completed. The reporting date to be used by all participants should be end December 2009.
15. In QIS5 there are two methods of presenting internal model results for filling in the sheets:
 - Method 1 (Sheets: IM. Internal Models Results and IM. Internal Model Parameters) - attribution of risks from undertakings' own internal model structure into the standard formula structure. This part of the spreadsheet is only for QIS5 purposes, just to compare the results of the standard formula with those derived from internal models. **It does not mean that the internal model must follow the standard formula structure.**
 - Method 2 (Sheets: IM "blank" sheet results and IM "blank" sheet parameters) to present undertakings' own structure of internal models.
16. Undertakings are strongly encouraged to fill in the spreadsheet with both methods and supply the requested data.
17. In the case of partial internal model the standard formula results for the non-modelled scope should be filled in the IM. Internal Model Results sheet (Part II). The value of SCR for the non-modelled part will occur automatically in the IM "blank" sheet results as well.
18. According to article 122 of the SII Directive undertakings may use a different time period or risk measure (than that used in the standard formula) for internal modelling purposes as long as the outputs of the internal model can be used to calculate the SCR in a manner that provides policyholders and beneficiaries with a level of protection equivalent to that set out for the standard formula (VaR, 99.5% confidence level in one year time horizon of the Basic Own Funds). If undertakings use a different time period and/or different risk measures for internal modelling purposes, they will need to show that the calculated SCR gives a level of protection equivalent to that set out in Article 101 of the Solvency II Directive. Thus, the undertaking shall reconcile the outputs of the internal model (using the different risk measure and/or time horizon) to the 99.5% VaR of the Basic Own Funds over a one-year period³.
19. In the spreadsheet the term economic capital refers to the capital requirement according to the original calibration of the internal model, i.e. using the risk measure, confidence level and time horizon, and the outcome as used by the undertaking. The term SCR relates to the required capital after a possible recalibration, equivalent to the measure, level and horizon required by the Framework Directive article 101(3).

³ CEIOPS' Advice for Level 2 Implementing Measures on Solvency II: Articles 120 to 126 Tests and Standards for Internal Model Approval

20. In order to allow CEIOPS to analyse this issue, undertakings are requested to provide for each risk, sub-risk and type of activity for which recalibration is performed the resultant risk measure, confidence level and time horizon.

Sheet IM.Internal Model Results

In this sheet the internal model results are only for comparison with standard formula results and the sheet does not mean that the internal model must follow the structure of the standard formula. Please provide on a best effort basis, how the results would look like if the model followed the standard formula structure. For your own (open) structure of the internal model, please see the IM "blank" sheets. Additionally, in this sheet undertakings using a partial internal model (PIM) should present the non modelled part.

1. Full vs partial internal model (the option in cells C-D15, C-G26, M26, C-I 38, C-I 50, C-E62, C-H74, C-D86, C-E98). In case of full internal model all answers should be "no".
 - For PIM: there are many various ways of building partial models and the sheet can not fit all of them but nevertheless the part of SCR calculation covered by the standard formula should be done here (in the second part of the sheet "non-modelled"). Undertakings using partial internal model are asked to start with the choice which modules/submodules are calculated **completely** with the standard formula - option "yes" in the relevant cells: C-D15, C-G26, M26, C-I 38, C-I 50, C-E 62, C-H 74, C-D 86, C-E 98 means that the relevant modules/submodules are not modelled. Undertakings should focus on the word completely, for example if only interest rate risk in the market risk was calculated by the internal model, then market risk is not completely calculated by the standard formula and in the relevant cell should be "no". If the option "yes" is chosen the following steps will be taken automatically:
 - irrelevant part of the sheet will be shaded,
 - the value 0 will be put in the relevant cell of the "modelled part" of the sheet (therefore the cells are not input cells anymore)
 - the standard formula results will be automatically put in the "non-modelled part" at the lowest level of aggregation in rows 132,135,141,144,147. This values can be changed for example in the case described in the instructions to the section *SCR calculated with the standard formula on the non-modelled scope* .
 - In principle to integrate partial internal model into the standard formula undertakings should use standard formula correlations unless there is strong evidence that it is neither possible nor appropriate due to the risk profile or the structure of the partial internal model. CEIOPS is preparing integration techniques which should be used by undertakings if the standard formula correlation matrix can not be applied. Since those techniques are still under development, for QIS5 purpose only, insurance and reinsurance undertakings shall use their own integration technique, provided that they comply with the test and standards set out in articles 120 to 125 of the Solvency II Directive (2009/138/EC) and appropriately reflect the risk profile. Within the modelled scope of the partial internal model the aggregation techniques used are up to undertakings.
 - In the above example where only interest rate risk is calculated by the internal model the participant should aggregate equity, currency, spread and property risks by the standard methods at first, put the value which is calculated in the cell D129 (it is in fact pseudo market risk) as a new submodule in the market risk calculation (for example in J39) and aggregate them using own integration method (correlation matrix or other).
2. The methods of aggregations in the full or partial model (drop down menu) can be chosen in the cells C10, N32, O44, O56, H68, L80, H92, K104 at each level (we assume that participants are familiar with the standard formula structure). If the

option correlation matrix is chosen the calculation in the cells K99, H87, L75, H63, O51, P39 , /Q39, N27 and C9 will be done automatically and the following comment will occur in the cells K106, H94, K82, H70, O58, O46, N34, C12 respectively: "If correlation matrix is different than in standard formula, please change the relevant correlation matrix in IM.Internal Model Parameters sheet" as participants are allowed to use own correlation parameters in the modelled part of SCR. In the market risk there is an additional possibility to choose upward/downward option as there are two correlation matrixes: for the interest rate shock up and interest rate shock down.

3. Participants should at first complete the tables at the lowest level of aggregation, for example: start with the table in rows: 96-105 (non life risk aggregation) and go up through Non SLT Health risk and SLT Health risk aggregation, Health risk aggregation, Life underwriting risk aggregation and Market risk aggregation till Basic SCR individual risks, BSCR final calculation and the SCR final calculation table.

Section Non-life underwriting risk aggregation

- In this section information is required on the value of Non-Life underwriting risk aggregation (for example: premium & reserve risk, lapse risk etc.) and other risks not covered by the standard formula but covered by the internal model. Undertakings should fill in this section only if they chose "no" in the cell G26.
- In the cells from F97 to J97 undertakings should fill in the names of the risks not explicitly covered by the standard formula but covered by the internal model (delete "The name of the risk" and put the name of the risk). If there are more than 5 risks, undertakings should add the new table (please, copy and paste the cells from J97 to J105 before the column for the Non-Life underwriting risk aggregated. The password is blank. If in K104 (the current numeration) the option correlation matrix is chosen please remember to change the formula in K99 (the current numeration) accordingly to take into account all risks (especially the first one) and to add relevant cells to the correlation matrix F117-M124 in IM parameters sheet).
- Cells from C99 to J99: the amount of the regulatory capital for the submodules (SCR)
- Cell K99: the amount of regulatory capital for the Non-Life underwriting risk. This calculation is done automatically if undertakings chose in the cell K104 – correlation matrix. Otherwise undertakings should delete the formula and put their own value of the Non-Life techniques underwriting risk.
- Cells in row 100: the amount of economic capital, see par. 17 and 18. If the given risk is completely calculated by the standard formula in the cell should be 0. The same explanation is valid for rows 88, 76, 64, 52,40, 28 and 17.
- Cells in row 101: undertakings should put here the name of the risk measure which they use in the internal model(see explanation in paragraph 17, it is also valid for confidence level and time horizon). The same explanation is valid for rows 89, 77, 65, 53,41, 29 and 18.
- Cells in row 102: undertakings should put here the value of the confidence level which they use in the internal model. The same explanation is valid for rows 90, 78, 66, 54, 42, 30 and 19.
- Cells in row 103: undertakings should put here the time horizon which they use in the internal model. The same explanation is valid for rows 91, 79, 67, 55, 43, 31 and 20.
- Cells in row 105: undertakings should put here the amount of the allocated SCR (after diversification). The same explanation is valid for rows 93, 81, 69, 57,45, 33 and 21.

Section Health Non-similar to Life techniques underwriting risk aggregation

- In this section information is required on the value of health non-similar to life techniques underwriting risk aggregation (for example: Health premium & reserve

risk etc.) and other risks not covered by the standard formula but covered by the internal model. Undertakings should fill in this section only if they chose "no" in the cell D62.

- In the cells from E85 to G85 undertakings should fill in the names of the risks not explicitly covered by the standard formula but covered by the internal model. If there are more than 3 risks, undertakings should add the new table (copy and paste the cells from G85 to G93 before the column for the Health Non-similar to Life techniques underwriting risk aggregated). The password is blank. If in H92 (the current numeration) the option correlation matrix is chosen please remember to change the formula in H87 (the current numeration) accordingly to take into account all risks (especially the first one) and to add relevant cells to the correlation matrix F92-J96 in IM parameters sheet.)
- Cells from C87 to G87: the amount of SCR
- Cell H87: the amount of regulatory capital for the Health Non-similar to Life techniques underwriting risk. This calculation is done automatically if undertakings chose in the cell H92 – correlation matrix. Otherwise undertakings should delete the formula and put their own value of the Health Nonsimilar to Life techniques underwriting risk.
- Cells in row 88-91 and 93: please compare the instructions to rows 100-103 and 105 respectively.

Section Health Similar to Life techniques underwriting risk aggregation

- In this section information is required on the value of health similar to life techniques underwriting risk aggregation (for example: Health mortality risk, Health longevity risk etc.) and other risks not covered by the standard formula but covered by the internal model. Undertakings should fill in this section only if they chose "no" in the cell C62.
- In the cells from I73 to K73 undertakings should fill in the names of the risks not explicitly covered by the standard formula but covered by the internal model. If there are more than 3 risks, undertakings should add the new column (copy and paste the cells from K73 to K81 before the column for the Health Similar to Life techniques underwriting risk aggregated). The password is blank. If in L80 (the current numeration) the option correlation matrix is chosen please remember to change the formula in L75 (the current numeration) accordingly to take into account all risks (especially the first one) and to add relevant cells to the correlation matrix F77-N85 in IM parameters sheet).
- Cells from C75 to K75: the amount of SCR.
- Cell L75: the amount of regulatory capital for the Health Similar to Life techniques underwriting risk. This calculation is done automatically if undertakings chose in the cell L80 – correlation matrix. Otherwise undertakings should delete the formula and put their own value of the Health Similar to Life techniques underwriting risk.
- Cells in row 76-79 and 81: please compare the instructions to rows 100-103 and 105 respectively.

Section Health underwriting risk aggregation

- In this section information is required on the value of health underwriting risk aggregation (for example: Health SLT risk, Health cat risk etc.) and other risks not covered by the standard formula but covered by the internal model. Undertakings should fill in this section only if they chose "no" in the cell F26.
- In the cells from F61 to G61 undertakings should fill in the names of the risks not explicitly covered by the standard formula but covered by the internal model. If there are more than 2 risks, undertakings should add the new column (copy and paste the cells from G61 to G69 before the column for the Health underwriting risk aggregated). The password is blank. If in H68 (the current numeration) the option correlation matrix is chosen please remember to change the formula in H63 (the current numeration) accordingly to take into account all risks (especially the first one) and to add relevant cells to the correlation matrix F68-J72 in IM parameters sheet).

- Cells from C63 to G63: the amount of SCR
- Cell H63: the amount of the of regulatory capital for the Health underwriting risk. This calculation is done automatically if undertakings chose in the cell H68 – correlation matrix. Otherwise undertakings should delete the formula and put their own value of the health underwriting risk.
- Cells in row 64-67 and 69: please compare the instructions to rows 100-103 and 105 respectively.

Section Life underwriting risk aggregation

- In this section information is required on the value of life underwriting individual risks (for example: mortality risk, longevity risk etc.) and other risks not covered by the standard formula but covered by the internal model. Undertakings should fill in this section only if they chose “no” in the cell E26.
- In the cells from J49 to N49 undertakings should fill in the names of the risks not explicitly covered by the standard formula but covered by the internal model. If there are more than 5 risks, undertakings should add the new column (copy and paste the cells from N49 to N57 before the column for the Life underwriting risk aggregated). The password is blank. If in O56 (the current numeration) the option correlation matrix is chosen please remember to change the formula in O51 (the current numeration) accordingly to take into account all risks (especially the first one) and to add relevant cells to the correlation matrix F101-Q112 in IM parameters sheet).
- Cells from C51 to N51: the amount of SCR
- Cell O51: the amount of regulatory capital for the Life underwriting risk. This calculation is done automatically if undertakings chose in the cell O56 – correlation matrix. Otherwise undertakings should delete the formula and put their own value of the life underwriting risk.
- Cells in row 52-55 and 57: please compare the instructions to rows 100-103 and 105 respectively.

Section Market risk aggregation

- In this section information is required on the value of market individual risks (for example: interest rate risk, equity risk etc.) and other risks not covered by the standard formula but covered by the internal model. Undertakings should fill in this section only if they chose “no” in the cell C26.
- In the cells from J37 to N37 undertakings should fill in the names of the risks not explicitly covered by the standard formula but covered by the internal model. If there are more than 5 risks, undertakings should add the new column (copy and paste the cells from N37 to N45 before the column for the Market risk aggregated). The password is blank. If in O44 (the current numeration) the option correlation matrix is chosen please remember to change the formulas in P39 or Q39 (the current numeration) accordingly to take into account all risks (especially the first one) and to add relevant cells to the correlation matrix F51-Q62 or F36-Q47 in IM parameters sheet).
- Cells from C39 to N39: the amount of SCR
- Cell O39: the amount of regulatory capital for the market risk. This calculation is done automatically if undertakings chose in the cell O44 – correlation matrix and upward/downward option. Otherwise undertakings should delete the formula and put their own value of the market risk.
- Cells in row 40-43 and 45: please compare the instructions to rows 100-103 and 105 respectively.

Section Basic SCR individual risk

- In this section information is required on the value of BSCR individual risks (for example: market risk, underwriting risk etc.) and other risks not covered by the standard formula but covered by the internal model.
- There is no lower level of aggregation for the counterparty default risk and intangible assets risks.
- In the cells from H25 to L25 undertakings should fill in the names of the other risks not explicitly covered by the standard formula but covered by the internal

model. If there are more than 5 risks, undertakings should add the new column (copy and paste the cells from L25 to L33 before the column for the intangible assets). The password is blank. If in N32 (the current numeration) the option correlation matrix is chosen please remember to change the formula in N27 (the current numeration) accordingly to take into account all risks (especially the first one) and to add relevant cells to the correlation matrix F22-O31 in IM parameters sheet).

- Cells from C27 to M27: the amount of SCR
- Cell N27: the amount of regulatory capital for the BSCR. This calculation is done automatically if undertakings chose in the cell N32 – correlation matrix. Otherwise undertakings should delete the formula and put their own value of the BSCR.
- Cells in row 28-31 and 33: please compare the instructions to rows 100-103 and 105 respectively.

Section BSCR Final Calculation

- In this section information is required on the value of BSCR, operational risk and other risks not covered by the standard formula but covered by the internal model.
- In the cells from E14 to I14 undertakings should fill in the names of the risks not explicitly covered by the standard formula but covered by the internal model. If there are more than 5 risks, undertakings should add the new column to the right (copy and paste the cells from I14 to I22). The password is blank. If in C10 (the current numeration) the option correlation matrix is chosen please remember to change the formula in C9 (the current numeration) accordingly to take into account all risks (especially the first one) and to add relevant cells to the correlation matrix F11-L17 in IM parameters sheet).
- Cell C16, D16: the amount of regulatory capital for the BSCR and operational risk.
- The cells E16- I 16: the amount of SCR for other risks not covered by the standard formula.
- Cells in row 17- 21: please compare the instructions to rows 100-103 and 105 respectively.
- Cells in row 22: undertakings should put here the information of the chosen method of capital allocation.

Section SCR Final Calculation

- In this section information about SCR final calculation are requested. Undertakings are requested to provide information about SCR calculated by an internal model (full or partial), SCR calculated by the standard formula (in the case of partial internal model) and overall SCR.
- Cell C9: the amount of SCR calculated by the internal model (it is valid for undertakings using full and partial internal model). If undertakings choose, in the cell C10, option "other" then they should delete the formula and just put the value.
- Cell D9: the amount of SCR calculated by the standard formula (it is valid for undertakings using partial internal model), it is done automatically⁴.
- Cell E9: the amount of overall SCR. For the partial internal model : if the non-modelled part has been already aggregated into the modelled part (CEIOPS assumes that this takes place in most cases the value in the cell E9 should be equal to the value in the cell C9. If however the aggregation is carried out at between modelled and non modelled part (for example if only risks not covered by the standard formula are modelled) an own integration technique can be used.
- Cell E11: the amount of economic capital, see par. 19

Section SCR calculated with the standard formula on the non-modelled scope

⁴CEIOPS is aware of the fact that the aggregation is carried out rather on the basis of risks modules/submodules than on the basis of the modelled and non-modelled part. However this value is calculated to compare the amount of SCR which is modelled by the internal model and could be helpful if the model has been built only for the risks not covered by the standard formula. The whole process of standard aggregation could be also applied in calculation and aggregation of the non modelled SCRs on the lower lever.

- This section is valid for insurance undertakings using partial internal model. In this section information is required on the value of overall SCR, BSCR and the individual SCR risks calculated by the standard formula. The whole calculations in this section are done automatically.
- Please be aware that if the option "no" has been chosen for the relevant module the value which arises can be different from the 0 as there is a "pseudo-value" for that risk which comes from the aggregation of some submodules calculated by standard formula and labelled by the option "yes".
- For example, if the mortality risk for one business unit is modelled, and the mortality risk for the remaining business units are calculated by the standard formula the approach should be as follows. The answer in C50 is "no". In the cell D135 should be the value of SCRmort for the non-modelled business units (the formula should be removed) and in the table for modelled part (rows 48-57) the non-modelled part of SCRmort should be added in column J as a new risk. The modelled part should be put in the column C. The Method of aggregation is up to undertaking.

Sheet IM.Internal Model Parameters

In this sheet undertakings should:

- fill in the correlation matrixes with their own correlation parameters for the other risks not covered by the standard formula
- change the standard formula correlation parameters if they use different correlation parameters in their internal models

present parameters used in their internal models for market, life and non life risk modules which can be compared with standard formula parameters.

- In this section there are matrixes for aggregation of the overall SCR, BSCR and individual SCR risks (market risk, life underwriting risk etc). Matrixes contain the same parameters as used in standard formula calculations (for example matrix for the BSCR aggregation has the same parameters as the matrix in point **SCR.1.32** in the **QIS5 Technical Specification**). There is an additional matrix for the aggregation of the operational risk and BSCR. In QIS5 TS operational risk is just added to the BSCR.
- In this sheet matrixes are taken into account if undertakings choose as a method of aggregation in the sheet **IM.Internal Model Results** – correlation matrix. For example if the undertaking in the sheet **IM.Internal Model Results** chose in the cell N32 correlation matrix, the matrix from cells F22-O31 will be taken into account in the calculations.
- Undertakings are requested to put into matrixes the names and correlation parameters for other risks not covered by the standard formula but covered by their internal model. For example in the cell K21 undertakings should fill in the name of the risk not covered by the standard formula and in the cells K22 –K26 and F27-J27 put the relevant parameters.
- If parameters in the correlation matrixes used by undertakings are different than those used in the standard formula undertakings should change the relevant parameters. For example if correlation parameter between market and life underwriting risk is not 25% as in the standard formula undertakings should delete this parameter and put their own value.
- This sheet contains also parameters from the standard formula for market, life and non-life risk modules (rows 128 -214). If it is possible for undertakings to present internal model parameters which are comparable to the standard formula parameters, undertakings are requested to put these internal model parameters in column F.

Sheet IM "blank" sheet results

This is a sheet which allows insurance undertakings to present their own structure of the model. In this sheet insurance undertakings should provide information about their internal model results for every risks/sub-risk/risks factors/lines of business/other covered by the internal model.

Section SCR Final Calculation

- In this section information about SCR calculation are requested. Undertakings are requested to provide information about SCR calculated by an internal model (full or partial), SCR calculated by the standard formula (in the case of partial internal model) and overall SCR.
- This is the open sheet as each internal model has a different structure. Undertakings should present here the structure of their internal model. They should fill in the names of their own risks/risk factors/business units/lines of business/other covered by the internal model according to their level of aggregation.
- The structure of the full internal model used by undertakings in many cases may cover the risks included in the standard formula, to the extent that they are applicable to undertakings. However, the way in which these risks are grouped or defined may differ slightly between the undertakings.
- In the headings "Name" (row 13, 22 etc.) undertakings should fill in the names of the risks/risk factors/business units/lines of business/other covered by the internal model. Please delete the heading "Name" and put your own name for all levels of aggregation. Name 1, Name 2 etc. denotes the first one, , Name 1.1, Name 1.2 etc. denotes the second one for the risk/risk factor/etc. which was put as Name 1. By analogy, Name 2.1, Name 2.2 denotes the second level of aggregation for the risk/risk factor/LoB etc. which was put as Name 2 and Name 1.1.1, Name 1.1.2 etc. denotes the third level of aggregation for the risk/risk factor which was put as Name 1.1.
- Undertakings should add new tables if they use more level of aggregation risks/risk factors/LoBs/business units/other .
- Undertakings are also requested to provide the amount of the economic capital, risk measure, confidence level and time horizon which they use for calculation (see explanation in paragraphs 18-20).
- Undertakings are requested to put data about Risk Margin delivered from the internal model, see par. 9)
- The cell D9: value of SCR for non-modelled part (in case of partial internal model) which is taken automatically from the IM.Internal Model Result sheet. The automatization will work only if undertakings complete the IM.Internal Model Result sheet (Part II).

Sheet IM "blank" sheet parameters

In this sheet insurance undertakings should fill in the correlation matrixes with their own correlation parameters if they use this aggregation method in their internal model. Insurance undertakings should also fill in the most important parameters used in their internal models.

- In terms of approaches to modelling co-dependencies between risk types, undertakings model it at different levels of granularity, depending on their internal model structure. For example, undertakings might model co-dependencies between entities in a group, or between risk types or between individual contracts⁵.
- The calculation of SCR by the standard formula follows a structured step-by-step approach. There are six main risk categories which can be divided into several components or sub-modules. In order to analyze undertakings' own approaches they are requested to present all the steps (levels) of their internal models' aggregation. Undertakings should present the aggregation matrixes used to combine the results of specific risks/sub-risks/risk factors/LoBs etc. They are encouraged to present risks and matrixes at the most detailed level of granularity. If for example undertaking uses a large correlation matrix (impossible to present it in the Excel) to aggregate all sub-risks in one step it can provided correlation parameters for main risks. It is important, however, that the provided information

⁵ CEIOPS - IntMod - 01/09, Stock-taking report on the use of Internal Models in Insurance, CEIOPS' Internal Model Expert Group

provides as much as possible a clear insight in the various levels of granularity and their aggregation/breakdown, whereby all levels of granularity – risks and matrices - used in the internal model are reported.

- Undertakings which use correlation matrix as a method of aggregation should put their own parameters for each level of aggregation. In the columns and rows which have headings "Name" undertakings should put names of risks/risk factors/business units/lines of business/other which are covered by their internal model. Name 1, Name 2 etc. denotes the first level of aggregation. Name 1.1, Name 1.2 etc. denotes the second level of aggregation for the risk/risk factor/ which was put as Name 1. Name 2.1, Name 2.2 etc. denotes the second level of aggregation for the risk/risk factor etc. which was put as Name 2.
- Undertakings should add the new tables for correlation matrixes if they use more levels of correlations than specified in this sheet.
- If undertakings do not use correlation matrixes they are asked to describe integration techniques in the qualitative questionnaire (please, see question QIM57 in the qualitative questionnaire (Word version)).
- Undertakings are requested to provide information about parameters which are important in the internal model and were not provided in the comparison table of parameters for market, life and non-life underwriting risks in the IM. Internal Model Parameters sheet. As many rows as necessary can be added by the undertakings to the table below the row 75.

Submission of the spreadsheets

21. The internal models sheets will be submitted with the core spreadsheet. Data from the sheets will greatly assist an assessment of the internal modelling by the supervisor, and also, importantly, a productive feed back of the findings to the individual undertaking.
22. Undertakings are also reminded to submit the internal model qualitative questionnaire. These also provide further opportunity to receive additional information about the current stage of the undertakings' works on internal model.