

**Diversification study on Solvency II Internal Models, 2020**

Instructions to participating undertakings for filling out the data request

**Response deadline: 15-01-2021**

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# Purpose

The aim of this document is to provide instructions to the insurance undertakings participating in the EEA-wide comparative study on diversification in internal models. It should be considered carefully before filling out the response templates.

# Context

*Diversification*

In general, the modelling of dependencies and aggregation, as effect typically called diversification, within internal models has a significant impact to the overall solvency capital requirement (SCR) of insurance undertakings.

The objectives of the Diversification Project Group are the following:

1. Gain an overview of the current approaches in the market and, on best effort basis, analyse and compare the levels of diversification
2. Facilitate a better understanding of modelling dependencies, aggregation and resulting diversification benefits
3. Enhance quality and convergence of supervision in internal models.

This data request aims to support meeting these objectives.

*References*

Comparative studies are supported by the EIOPA opinion ‘*EIOPA-BoS-15/083[[1]](#footnote-2)’* of 14 April 2015. The Board of Supervisors has authorized this data request.

# Participation to this data request

*Expectation on participation*

Participants are individual undertakings of the EEA[[2]](#footnote-3) using an approved internal model.

Where required, insurance groups are also expected to participate on request of the group supervisor.

Undertakings are not expected to fill in the Excel template in the following cases:

1. Top-level aggregation is performed with the standard formula approach, i.e. by applying the correlation matrix specified in Annex IV (1) of the Directive;
2. The undertaking is based in the UK

**The undertakings under point 1 are expected to only fill in a subset of the qualitative questionnaire in the Survey tool. The introduction note of the qualitative questionnaire describes this subset:**

**https://ec.europa.eu/eusurvey/runner/Diversification\_qualitative\_questions**

*Preliminary assumption*

The data request assumes that for the total SCR, at least the mean and the 0.5% confidence level estimators, corresponding to an adverse economic result, could be provided from the aggregation of the ‘top level risks’. For the standardized model this refers to the risks ‘Market’,’Credit’,’Life’,’Non-Life’,’Health’,’Operational’,’Cross terms (if applicable)’ and ‘other’. The ‘top level risks’ for the Internal Model reporting tab comprise risks that typically are reported on the top level “below” the total SCR like: market risk, credit risk, combined market & credit risk, life underwriting risk, non-life underwriting risk, health underwriting risk and operational risk, sometimes specific risks following risk profile and modelling approach. Typically, a set of percentiles and – if possible – scenario by scenario profit and loss data are also expected to be available.

*Benefits for the participating undertakings*

The advantages for undertakings include:

* + A more level playing field via an enhanced harmonization of the supervision;
	+ An increased acceptance of aggregation within internal models via a better understanding of the source of diversification benefits;
	+ Potential opportunities for model improvements.

*Contact points*

In the case of individual undertakings belonging to a group with group supervisor in the EEA, the group supervisor is the contact point for the whole group (unless specified otherwise by your supervisor).

In the case of EEA individual undertakings belonging to a group whose head is outside the EEA, the responses per participating solo should be provided to either the group supervisor of a potentially existing EEA subgroup or to the responsible EEA solo-supervisors.

As an aside, please note that your (group) supervisor might want to augment the data request with its own additional questions or requests.

For practical purposes, undertakings are advised to designate (at least) two contact persons, who will liaise with their (group) supervisor for the purpose of this data request.

# Data request

# Overview

This subsection briefly outlines the data requested, and the next subsections provide more details for individual parts of the data request.

The data as at year-end 2019 (i.e. 31 December 2019) are requested from the participants, using the internal model calibrated for year-end 2019 in the reporting currency.

Companies should use the convention that gains are denoted by positive values of the economic amounts and losses by negative values.

This data request consists of a quantitative submission in several parts:

* + 1. Standardized model reporting

This section contains information on standardized risks, i.e. on top-level risks (market, credit, life, non-life, health, operational, and if applicable other risks and cross terms) that are obtained from the risks modeled by the undertaking in the internal model and reorganized in a way such that the structure corresponds to that defined in the standard formula,

Moreover, even if not taken into consideration in the definition of the standard formula, cross terms and other risks are also considered, so that they can be valued if explicitly introduced in the internal model.

Finally, the operational risk is introduced at the same level as the other top risks, as often modeled in internal models, and unlike what is defined in the standard formula.

This reorganization of the risks is necessary in order to allow a cross-sectional comparison on the internal models approved in the European context.

Please note, this reporting template is automatically derived from the ‘internal model reporting’ tab. In EIOPA’s analysis, we take into account that the standardization, given the individual approximations and adjustments, is a first step towards the comparison of undertakings. We acknowledge that the underlying exposures differ and will consider this in the analysis. In the analysis, we further acknowledge the strong link between the marginal distribution and its dependency structure.

* + 1. Internal model reporting

In this section, the undertaking or in case relevant, the group, is expected to provide quantitative information regarding the distribution of the top-level risks as defined in the internal model and the resulting SCR after aggregation. Certain specific sub-risks are treated separately in order to facilitate the comparison with other internal models even if there are different risk definitions.

* + 1. Company/group profile

This section contains

* economic values that define the risk profile of the undertaking or group;
* the modelled Value-at-Risk (mVaR) is the equivalent of SCR before tax, obtained by aggregating the distributions of market, credit, non-life, life, health, business, operational and other risks. If we add to the mVaR the Loss Absorbing Capacity for Deferred Taxes, the diversified SCR of possible risks not included in the model, the diversified SCR of entities using the Standard Formula, other entities and other adjustments, this adds up to the SCR.
* the additional adjustments to the mVaR, needed to obtain the total capital requirement before tax of the individual undertaking or of the group in question.
	+ 1. Correlation matrices

This section contains information on the linear (i.e. Pearson) correlation matrix between risk losses at top level. This information should be provided by the undertakings using the VaR-CoVaR aggregation method, for the undertakings using other methods this information will be derived by the project group from the simulation data.

The quantitative submission contains an extra sheet ‘Validation checks’. This sheet will be used to validate the coherence of the provided information and does not need to be filled in.

# Specification of the requested information and values.

Summary on some common terms used throughout the Excel.

* + *Expected Result*: The expected result (at t=1) is expected to correspond to the mean of the profit and loss distribution before consideration of Loss Absorbing Capacity of Deferred Taxes.
	+ *0.5% quantile of the distribution*: This value corresponds to the 0.5% quantile of the profit and loss distribution before consideration of Loss Absorbing Capacity of Deferred Taxes without the use of any smoothing or other adjustments. This will commonly translate into the result of the one specific scenario referencing this quantile. We use the convention that losses are modelled by negative profit and loss values. This low quantile thus corresponds to an adverse economic result.
	+ *Modelled Value-at-Risk (mVaR)*: Broadly speaking, undertakings are expected to apply their modelled ‘SCR definition’ to the total profit and loss distribution before consideration of Loss Absorbing Capacity of Deferred Taxes. Hence, the mVaR might differ from the 0.5% sample quantile on the simulated asset values, owing to the statistical estimator for the 0.5% percentile (e.g. including any interpolation or smoothing scheme). Furthermore, some undertakings might allow for a centering of the distribution by deducting the expected result.
	+ *Selected prescribed percentiles*: they should be directly taken from the simulated profit and losses before consideration of Loss Absorbing Capacity of Deferred Taxes or by other means derived from the model, depending on the approaches. Undertakings simulating a risk are at least expected to provide the 50th percentile and the 0.5th percentile.
	+ *Scenario-by-scenario data*: directly taken from the simulated profit and losses but before consideration of Loss Absorbing Capacity of Deferred Taxes or by other means derived from the model, depending on the approaches. The number of scenarios should be in line with the number of scenarios in the default internal model setup.

# More detailed specification of parts of the data request

1. Standardized model reporting

This tab contains three sections:

1. Synthetic data derived from the probability distribution of each risks.
2. Value of the probability distributions of the profits and losses at a predefined set of percentiles associated with standardized risks
3. Related scenarios of profits and losses associated with standardized risks

If the undertakings fills in the ‘Internal Model Reporting’ tab, the links in this tab should automatically fill in the simulation data and the percentiles. The undertaking should only fill in the ‘Expected Result at t=1’, the 0.5% quantile of the distribution and the ‘Modelled Value-at-Risk (VaR)’. The undertaking should assure however that the simulation data covers the same number of simulations as in the ‘Internal Model Reporting’.

In the graph below a high-level overview of the standardization of the risks can be found.

The standardized risks have the following definition:

* **Standardized market risk** is obtained, scenario by scenario, by summing the following elements from the internal model reporting tab:
* Other inflation risks included in market risk (inflation risk for life, non-life and health are not considered here).
* Other market risks including cross-terms (migration & default risk and inflation risk are not considered here). These would typically include interest rate, equity, property, implied volatility, prepayment and credit spread risk for mortgages, etc. as well as FX risk if modelled in market risk.
* Credit spread risk related to financial instruments if included in credit risk.
* FX risk if included in credit, business, life, non-life, health risk and operational risks.
* **Standardized credit risk** is obtained, scenario by scenario, by summing the following elements:
* Migration & Default risk financial instruments included in market risk.
* Other Credit risks including cross-terms (credit spread risk, premium risk credit & suretyship and FX risk in credit risk, if included in credit risk, are not considered here). These would typically include credit risks related to reinsurance, mortgages, receivables, counterparty credit risk derivatives etc.
* **Standardized life risk** is obtained, scenario by scenario, by summing the following elements:
* Inflation risk life included in market risk (excluding non-life annuities).
* Expense and lapse risks life modelled separately (excluding non-life annuities).
* Other life underwriting risks including cross-terms (non-life annuities, health liabilities included in life, pension risk and FX risk life, if included in life, are not considered here). These would typically include mortality, life catastrophe, mass lapse etc. as well as expense and lapse risks not modelled separately.
* **Standardized non-life risk** is obtained, scenario by scenario, by summing the following elements:
* Inflation risk non-life included in market risk.
* Premium risk for credit & suretyship (if included in credit risk).
* Expense and lapse risk non-life modelled separately (including non-life annuities).
* Non-life annuities, if included in life.
* Other non-life underwriting risks (non-life health liabilities and FX risk non-life are not considered here). These typically include premium risk, reserve risk, natural catastrophe and man-made catastrophe.
* **Standardized health risk** is obtained, scenario by scenario, by summing the following elements:
* Inflation risk health included in market risk.
* Expense and lapse risk health modelled separately.
* Health liabilities included in life.
* Health Liabilities included in non-life.
* Other health underwriting risks (FX risk health is not considered here). This would typically include health catastrophe risks etc.
* **Standardized operational risk** is obtained, scenario by scenario, by summing the following elements:
* Other operational risks (FX risk Operational risk is not considered here). These would also include group risks.
* **Standardized other risk** is obtained, scenario by scenario, by summing the following elements:
* Liquidity risk (if modelled).
* Pension risk (if modelled separately).
* **Standardized cross terms** are equal, scenario by scenario, to the cross terms. Cross terms are defined as non-linear effects from the combined movement of risks
1. Internal model reporting

This tab focuses on the output of the top-level risks as designed in the internal model. As the internal model freedom may lead to different risk composition for different internal models, the aim of this tab is to allow standardization of the internal model output. The data required on this tab summarizes to information on the quantiles of the profit and loss distribution resulting from the internal model and the simulations or scenarios generated to calculate this information. A more detailed explanation of the information required in each row is given in section IV.2.

In the section ‘Model Indicators’ the undertaking is required to give an indication of its model structure based on the drop-down lists for Migration and default risk, for Credit spread risk, for Expense and lapse risks, for Premium risk Credit and Suretyship, for Underwriting risk from non-life annuities, for Health risks and for FX risks. In function of the choices that the undertaking makes, certain columns will be greyed out. These should be left blank. If the model structure of the undertaking is not part of the drop-down list, ‘Other’ should be selected

If it is impossible to generate distributions for the top-level risks, the undertaking is still expected to provide the expected value, 0.5% quantile, and the modelled Value-at-Risk for all risks that are not calculated using the standard formula. Please indicate if the simulation data available indicated in the row ‘is simulation data available’.

If the undertaking makes use of a Partial Internal Model (in terms of risks), only the data with respect to the risks in scope of the model should be entered in this sheet. Please indicate if the risk is incorporated in the model in the row ‘Is the risk modelled in the Internal Model or the Standard Formula’.

The columns contain the profit and loss distribution on aggregate level and per top-level risk,. The top-level risks, marked in dark blue, are further split into several specific sub-risks, marked in light blue, in order to re-allocate these sub-risks to other top-level risks in the standardization process, if necessary. An undertaking only needs to fill in detailed data for sub-risks if that sub-risk is modeled within the same top-level risk for their internal model. If this is not the case, the scenarios should be left blank. The input of the information on the whole tab should be based on the same scenario or simulation generation but multiple runs with different settings for the underlying risk factors may be necessary to obtain all necessary information. For example, if a Monte Carlo method is used to generate scenarios, the same random number generator seed for the simulation, if any, should be used over all runs, even if certain risk factors will become deterministic instead of stochastic. The input for the different columns is explained in the following steps.

1. The column ‘Total’ refers to the total profit and loss distribution after aggregation of the top-level risks For each scenario, it should therefore equal the sum of the same scenario over all top-level risks. For undertakings with a Partial Internal Model, this should equal the total over all risks included in the scope of the Internal Model.
2. The columns ‘Cross-terms’, ‘Market risk’, ‘Credit risk’, ‘Business risk’, ‘Life risk’, ‘Non-Life risk’, ‘Health risk’, ‘Operational including group risks’ and ‘Other Risks’ refer to the top level risks as defined in the internal model. If any of these risks are not present on the top level of an entity’s internal model (e.g. cross-terms are allocated within the top level risks or business risk is modelled within life/non-life/health), the profit and loss of the scenarios of these risks should be left blank. ‘Other risks’ contains all top-level risks modelled in the internal model but not mentioned explicitly in the other columns.
3. Each top-level risk is divided into several components in order to separate certain sub risks.

*Cross-Terms*

These cross terms are defined as non-linear effects from the combined movement of top-level risks (e.g. life underwriting risk movements creating a larger duration gap and therefore influencing the market risk). This column should only be filled in if the undertaking models the cross-terms separately from the top-level risks. If the model of the undertaking is such that cross-terms are incorporated within the simulation of the top-level risks (e.g. by making use of a bottom-up integrated approach), this column should not be filled in.

*Market risk*

Market risk is split into ‘Migration & Default risk’, ‘Inflation risk included in market risk’ and ‘Other market risks’. The scenarios in these three columns should sum to the scenarios in the ‘Market Risk’ column. The scenarios of any of these specific risks not modelled within market risk should be left blank.

The column ‘Other market risks’ should contain the scenarios over all sub risks except ‘migration and default risk’ and ‘inflation risk’. In general, one would expect risks such as interest rate, equity, property, implied volatility, prepayment and credit spread risk for mortgages etc. to be captured here. If relevant, the cross-terms between market risks, e.g. between interest rate and spread should be covered in this column.

If migration and default risk are not modelled within market risk, the respective scenarios should be left blank. If migration and default risk is modelled within market risk, the scenarios should be filled into this column. If no separate distribution is immediately available, the undertaking can calculate this distribution as the difference of two runs for market risk, namely one with and one without migration and default risk. The run with migration and default risk should be based on default internal model settings (e.g. including rating migrations). The run without migration and default risk should have the default internal model settings as well except for the rating migrations and defaults which have been rendered deterministic.. Since the seed should be consistent between both runs as mentioned above, the movement of other market risk factors should be consistent on a simulation-by-simulation basis between both runs.

Inflation risk is further split into its different types: inflation risk due to life, non-life, health business and other inflation risks. This last category would be expected to contain e.g. inflation risks related to inflation-linked bonds. How to determine this split will depend on the model set-up. The scenarios for the columns referring to inflation risk for life, non-life and health exposure can be obtained by applying, in case applicable, a specific loss proxy function to the technical provisions of life, non-life and health business respectively or by having separate simulation data. Note that the technical provisions should be taken net of reinsurance and that technical provisions for non-life annuities should be allocated to the non-life column. The input for the column for ‘Other inflation risks’ follows from applying the loss proxy function to all other balance sheet positions. Similarly, the total inflation risk should be equal to the sum of the subcomponents.

*Credit risk*

Credit risk is split into ‘Credit spread risk’, ‘Premium risk Trade Credit & Suretyship’, ‘FX risk in credit risk’ and ‘Other Credit risks’. The scenarios in these columns should sum to the scenarios in the ‘Credit Risk’ column. The scenarios of any of these specific risks if not modelled within credit risk, should be left blank.

The column ‘Other credit risks’ then contains the scenarios of the P&L distribution overall credit sub risks except credit spread risk, premium risk TCIS, exchange rate risk. If relevant, the cross-terms between credit risks should be covered in this column. Typically, the ‘Other credit risk’ would contain risks related to reinsurance, receivables, mortgages etc.

If credit spread risk for financial instruments is modelled within credit risk, the scenarios related to the credit spread risk should be filled into this column. If this distribution is not available, the undertaking can use in this column should be set to the difference of two runs, namely one with stochastic and one with deterministic credit spreads for financial instruments. This difference should be calculated on a simulation-by-simulation basis. If credit spread risk is not modelled within credit risk, the scenarios should be left blank.

The column ‘Premium risk Trade Credit & Suretyship’ (TCIS) should contain on a simulation-by-simulation basis the contribution of the TCIS premium risk towards the total credit risk. If FX risk and/or credit spread risk is also modelled within credit risk, they should be set to a deterministic setting (fixed spreads and FX rates) to calculate this contribution. If the TCIS premium risk is modelled outside of credit risk, the scenarios should be left blank.

The column ‘FX Risk in credit risk’ should contain the FX risk related to credit risks if not modelled within market risk, but within credit risk. If no separate simulation data is readily available, the undertaking can calculate this as a difference between two runs, namely one with stochastic and one with deterministic exchange rates. If exchange rate risk is not modelled within credit risk, the scenarios should be left blank.

*Expense and lapse risk*

The expense and lapse risks, when modeled explicitly and isolated from life, non-life and health risks, is split into its parts referring to the life, non-life and health business and ‘FX risk in expense and lapse risks’. For the columns referring to life, non-life and health risk, these columns should contain the P&L result per scenario for its respective sub-risk, considering constant FX rates if these are modelled within the expense and lapse risks module. The column for ‘FX risk in expense and lapse risk’ should contain the impact due to stochastic exchange rates. If this simulation data is not readily available the scenarios based on the undertaking can use the difference of two runs for the expense and lapse risk module: one run with standard internal model settings (e.g. including stochastic exchange rates) and one where exchange rates are fixed but all other settings remain unchanged. If exchange rate risk is not modelled within a separate expense and lapse risk module, the scenarios should be left blank. The scenarios of the expense and lapse sub-risks should sum up to the total expense and lapse risk. If expense and lapse risk is not modelled as a top-level risk, all scenarios should be left blank.

*Life risk*

Life underwriting risk is split into ‘Non-life annuities included in life underwriting risk’, ‘Health liabilities included in life underwriting risk’, ‘Pension risk’ (own personnel), ‘FX risk in life underwriting risk’and ‘Other life underwriting risks’. The scenarios in these columns should sum to the scenarios in the ‘Life Risk’ column. The scenarios of any of these risks not modelled within life risk should be left blank.

The column ‘Other life underwriting risks’ then contains the scenarios of the P&L distribution over all life underwriting sub risks except non-life annuities, health liabilities, pension risk and exchange rate risk. If relevant, the cross-terms between life risks should be covered in this column. This column would therefore typically contain longevity, mortality, lapse mass risks etc. as well as expense and lapse risks not modelled in a separate module.

The columns ‘Non-life annuities in life underwriting risk’, ‘Health liabilities in life underwriting risk’ and ‘Pension risk’ refer to the P&L result per scenario for each risk respectively. Note that exchange rate risk should not be included and therefore that these results should be based on fixed exchange rates.

The column ‘FX Risk in life underwriting risk’ should contain scenarios based on the difference of two runs for life underwriting risk: one run with standard internal model settings (e.g. including stochastic exchange rates) and one where exchange rates are fixed but all other settings are unchanged. If exchange rate risk is not modelled within life underwriting risk, the scenarios should be left blank.

*Non-Life risk*

Non-Life underwriting risk is split into ‘Health liabilities in non-life underwriting risk’, ‘FX risk in non-life underwriting risk’ and ‘Other non-life underwriting risks’. The scenarios in these columns should sum to the scenarios in the ‘Non-Life Risk’ column. The scenarios of any of these risks not modelled within non-life risk should be left blank.

The column ‘Other non-life underwriting risks’ then contains the scenarios of the P&L distribution over all non-life underwriting sub risks except health liabilities and exchange rate risk. If relevant, the cross-terms between non-life risks should be covered in this column. This column would typically contain the premium, reserve, man-made catastrophe and natural catastrophe risks related to the non-life liabilities.

The column ‘Health liabilities in non-life underwriting risk’ refers to the P&L result per scenario for health liabilities modelled within non-life underwriting risk. Note that exchange rate risk should not be included and therefore that these results should be obtained from a run with fixed exchange rates.

The column ‘FX Risk in non-life underwriting risk’ should contain scenarios based on the difference of two runs for non-life underwriting risk: one run with standard internal model settings (e.g. including stochastic exchange rates) and one where exchange rates are fixed but all other settings are unchanged. If exchange rate risk is not modelled within non-life underwriting risk, the scenarios should be left blank.

*Health risk*

If health risk is not modelled separately, all scenarios should be left blank.

Health underwriting risk is split into ‘FX Risk in health underwriting risk’ and ‘Other health underwriting risk’. The scenarios in these columns should sum to the scenarios in the ‘Health Risk’ column. The scenarios of any of these risks not modelled within health risk should be left blank.

The column ‘FX Risk in health underwriting risk’ should contain scenarios based on the difference of two runs for health underwriting risk: one run with standard internal model settings (e.g. including stochastic exchange rates) and one where exchange rates are fixed but all other settings are unchanged. If exchange rate risk is not modelled within health risk, the scenarios should be left blank.

The column ‘Other health underwriting risks’ then contains the scenarios of the P&L distribution over all health sub risks except exchange rate risk. If cross-terms are not modelled explicitly as a top-level risk, the cross-terms related to health risk should be covered in this column.

*Operational risk*

Operational risk is split into ‘FX Risk in operational risk’ and ‘Other operational risk’. The scenarios in these columns should sum to the scenarios in the ‘Operational Risk’ column.

The column ‘FX Risk in operational risk’ should contain scenarios based on the difference of two runs for operational risk: one run with standard internal model settings (e.g. including stochastic exchange rates) and one where exchange rates are fixed but all other settings are unchanged. If exchange rate risk is not modelled within operational risk, the scenarios should be left blank.

The column ‘Other operational risks’ then contains the scenarios of the P&L distribution over all operational sub risks except exchange rate risk. If cross-terms are not modelled explicitly as a top-level risk, the cross-terms related to operational risk should be covered in this column.

*Other risks*

The ‘Other Risks’ are further clarified in two columns: the column ‘Liquidity risk’ should contain the P&L result per scenario of the modelled liquidity risk and similar for the column ‘Pension Risk’. If both risks are modelled within another top-level risk, the scenarios should be left blank.

1. Company/group profile
* mVaR – this is the SCR before Tax included in the model. It is obtained by aggregating the distributions of top-level risks. The value in this cell should coincide with the value of the fields mVaR on the column “Total” in the two tabs
1. “Standardized model reporting” (it is obtained by summing the standardized risks of market, credit, non-life, life, health, operational and the cross terms and other risks contribution)
2. “Internal model reporting” (it is obtained by summing the risks of market, credit, business, life, non-life, health, operational, other risks and the cross terms).
* Miscellaneous – total of other contributions defined in the internal model but not already considered in the term mVar, like intangible risk, non-linearity and model adjustments, regulatory add-on, etc.
* Tax - loss absorbing capacity of deferred taxes (as defined in the Directive 2009/138/EC- section 9)
* Risks in Standard Formula – the diversified contribution of the risks included in the Standard Formula should filled in here. **This field is applicable only to undertakings with a Partial Internal Model.**
* Undertakings in standard formula - in particular, this field is valued in the case of groups to indicate the contribution obtained for some of the companies or insurance activities that do not fall within the scope of application of the internal model and are quantified using the standard formula. **This field is applicable to groups only**.
* Other institutions - in particular, this field is valued in the case of groups to indicate the contribution that is obtained for some of the non-insurance companies or activities, assessed using other methods than the standard formula. This should include, for example, the contribution from banking sector and pension funds (including ring fence funds, as business operated in accordance with Art. 4 of Directive 2003/41/EC). **This field is applicable to groups only.**
* SCR – total solvency capital requirement of the solo entity or the group under consideration. It should match the sum of the 5 previous terms.
1. Correlation matrices

This section contains information on the linear (i.e. Pearson) correlation matrix to be evaluated as an output of the internal model using the complete probability distribution of risks losses at top level.

Two cases are considered:

1. the linear correlation between the risks (market, credit, non-life, life, health, business, operational and other) defined according to the own classification adopted in the internal model,
2. the linear correlation between the risks (market, credit, non-life, life, health and operational) based on the standardized classification of risks.

Both matrices should correspond to the pair-wise linear correlations between the generated scenarios in the internal model and standardised model reporting tabs. If no scenarios could be provided (e.g. in a Var-Covar aggregation framework), the linear correlations used to aggregate the top-level risks should be filled in. If the granularity of the own correlation matrix deviates from the provided granularity for Internal Model reporting – Linear Output Correlation Matrices, the undertaking can leave correlations related to the risks which are not relevant blank. Similarly, if the undertaking has other risk categories, these can be added to the matrix in the cells provided.

# Deadline and practical aspects of filling out the data request

*Deadline*

Final deadline for all submissions **15th January 2021**. In case you have severe restrictions, please liaise with your supervisor to get additional support or discuss deadline flexibility[[3]](#footnote-4).

However, undertakings are invited to provide their (group) supervisor with the answers to the data request as soon as possible.

*Quantitative submission*

The data requested in the quantitative submission should be inserted in the dedicated sheets of the following ‘response template’ spreadsheet:

* ‘xxx.xlsx’,

*Data quality*

Please note that undertakings are expected to verify the correctness of their response to this data request before handing in their answers.

*Number format*

The economic quantities must be indicated in the unit of the currency used. Do not use data in thousands, millions, etc…

# Appendix

# Appendix 1: validation checks

Here the validation checks in the excel format are described (obviously this section of the Excel does not need to be completed by the undertaking or the group).

The following checks, scenario by scenario, are implemented:

1. The total in sheets “Standardized model reporting” and “Internal model reporting” should have the same value.

Concerning the “Standardized model reporting” the following check, on a scenario by scenario base, is implemented:

1. Total (col. D) is equal to the sum of cross-terms (col. E), market (col. F), credit (col. G), life (col. H), non-life (col. I), health (col. J), operational (col. K) and other (col. L).

Concerning the “Internal model reporting”, on a scenario by scenario base, the following checks are implemented:

1. Total (column D) is equal to the sum of cross terms (col. E), market (col. F), credit (col. N), business (col. S), life (col. X), non-life (col. AD), health (col. AH), operational (col. AK) and other (col. AN) risks.
2. Market risk (col. F) is equal to the sum of migration and default (col. G), inflation included in market (col. H) and other market risks including cross-terms (col. M).
3. Inflation risk included in market risk (col. H) is equal to the sum of inflation risk life included in market risk (excluding non-life annuities) (col. I) and inflation risk non-life included in market risk (incl. non-life annuities) (col. L).
4. Credit risk (col. N) is equal to the sum of credit spread risk financial instruments included in credit risk (col. O), premium risk credit & suretyship included in credit risk (col. P), FX risk credit risk included in credit risk (col. Q) and other credit risks including cross-terms (col. R).
5. Business risk (col. S) is equal to the sum of business risk life (col. T), business risk non-life (col.U), business risk health (col V) and FX risk business risk (col. W).
6. Life risk (col. X) is equal to the sum of non-life annuities included in life (col. Y), health liabilities included in life (col. Z), pension risk (col. AA), FX risk life included in life (col. AB) and other life underwriting risks including cross-terms (col AC).
7. Non-life risk (col. AD) is equal to the sum of non-life underwriting risks health liabilities included in life (col. AE), FX risk included in non-life (col. AF) and other non-life underwriting risks (col. AG)
8. Business risk (col. AH) is equal to the sum of FX risk health (col. AI) and other health risks (col AJ)
9. Operational risk (col. AK) is equal to the sum of FX risk included in operational risk (col. AL) and other operational risk (col. AM)
10. Other IM risks (col. AN) is equal to the sum of liquidity (col. AO) and pension (col. AP) risks
1. https://www.eiopa.europa.eu/content/preparation-internal-model-applications%E2%80%8B%E2%80%8B\_en?source=search [↑](#footnote-ref-2)
2. Excluding UK [↑](#footnote-ref-3)
3. Please note that regarding any relevant change in the deadline, the decision will have to be discussed with the EIOPA Diversification Project Group to ensure that the overall project schedule is not materially impaired. [↑](#footnote-ref-4)