Internal Models

LIFE UNDERWRITING RISK COMPARATIVE STUDY

Quantitative Data Request
Technical Specifications

European Insurance and
Occupational Pensions Authority

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The aim of this document is to provide instructions to the insurance and reinsurance undertakings participating in the EEA–wide comparative study on life underwriting risks in internal models. Please consider this document carefully before filling out the response templates of the Life Underwriting Risks Comparative Study data request (hereafter "this data request" or "the data request").

1. REQUIRED PARTICIPANTS

Comparative studies are supported by the EIOPA opinion 'EIOPA–BoS–15/0831' of 14 April 2015.

An undertaking is required to fill in this data request if the following criteria are met:

- The undertaking is an individual insurance or reinsurance company licensed in the EEA, and
- The undertaking uses an approved internal model that covers fully or partially any of the following risks:
    - Mortality risk
    - Longevity risk
    - Lapse risk
    - Expenses risk

2. DATA SUBMISSION MODALITIES

This data request consists of a set of CSV files comprising response templates (please refer to the zip file: EIOPA_LURCS_templates.zip) that should be thoroughly completed by the required participants depending on the life underwriting risks covered by their internal models.

Please fill in only the templates relevant to the risks covered by the approved internal model. The approved modules shall be specified in table G0. Please see section G0 – General information.

Please compress the filled templates (in CSV format) into a single zip file with the following naming convention: UTname_UTgroup_Country_yyyymmdd.zip, replacing "UTname" with the undertaking's name, "UTgroup" with the name of the undertaking's parent group, "Country" with the country in which the undertaking is licensed (using two letters as per ISO 3166-1 alpha-2 country codes) and "yyyymmdd" with the submission date.

Please submit the data to your NCA via your usual transfer channel.

3. REFERENCES AND CONVENTIONS

REFERENCE DATE AND REPORTING CURRENCY

The data as at year end 2023 (i.e. 31 December 2023) are requested from the participants, using the internal model calibrated for year end 2023 in the reporting currency. Please use the reporting currency as defined in article 2 of the Commission Implementing Regulation (EU) 2023/894.

SIGN AND NUMBER CONVENTIONS

Quantities should be reported as positive values, unless they would be reported negative in the QRTs. Numbers should have the dot "." as decimal separator and should have as many decimal numbers as deemed necessary by the undertaking. Quantities should be reported in unit, e.g. a 2% probability of lapse should be reported as 0.02, a 52 million value of technical provisions without risk margin should be reported as 52000000 etc.

SCR AND LOSS ABSORBING CAPACITY CONVENTION

Undertakings should provide values of the Solvency Capital Requirement that are gross the loss absorbing capacity of the deferred tax (LACDT) and net of loss absorbing capacity of the technical provisions (LACTP). SCRs in level 0 tables are expected to be provided after considering the diversification effect within each LURCS segment, while SCRs in level 1 tables are expected to be provided without considering the diversification effect within each LURCS segment.

LEGAL REFERENCES

Throughout this document, please refer to the following legal texts:

- Directive 2009/138/EC of the European Parliament and of the Council (Solvency II Directive)
- Commission Delegated Regulation (EU) 2015/35 (Solvency II Delegated Acts)
- Commission Implementing Regulation (EU) 2023/894 (ITS)

TERMINOLOGY

- The term "LURCS segment" should be understood as the segment of an undertaking's portfolio identified by the segmentation variables of the LURCS templates.
- The term "BEL cluster" as used in this chapter should be understood as an undertaking specific group of policies with similar technical characteristics. Each "BEL cluster" has specific BE assumptions.

- The term "SCR cluster" should be understood as an undertaking specific group of policies to which the Internal model applies the same sub-risk shock.

  Usually, undertakings use more granular BEL clusters than SCR clusters. For simplicity let's consider the sub-risk *Lapse level* assuming that undertaking A has:

  - Lapse BEL cluster split by lob and policy age and Lapse level SCR clusters split only by lob, and
  - life policies allocated to 2 LOBs (30 and 31) with policy age of maximum 5 years (0,1,2,3,4 and 5).

  As a result, undertaking A will have 12 Lapse BEL clusters and 2 Lapse SCR clusters as displayed in the illustrative example below:

Lapse BE cluster	Lob	policy age	BE assumptions Projection year = 1	BE assumptions Projection year = 2	...	Run off
1	30	0	2,4%	2,0%	...	...
2	30	1	3,3%	3,3%	...	...
3	30	2	5,7%	6,2%	...	...
4	30	3	8,2%	8,0%	...	...
5	30	4	3,5%	3,5%	...	...
6	30	5	5,5%	5,0%	...	...
7	31	0	3,2%	3,2%	...	...
8	31	1	2,1%	2,0%	...	...
9	31	2	6,5%	6,0%	...	...
10	31	3	7,7%	7,7%	...	...
11	31	4	2,8%	2,5%	...	...
12	31	5	4,1%	3,9%	...	...

Lapse Level SCR cluster	Lob	Lapse level stress
1	30	20%
2	31	13%

4. TECHNICAL SPECIFICATIONS

4.1 OVERVIEW

The data request consists of a set of tables, summarized in the table below. These tables comprise segmentation (or categorical) variables (e.g. Country, LOB, etc.), which define the granularity, and quantitative variables, which depend on the type of risk (e.g. SCR, Duration, etc.). The segmentation and quantitative variables are further specified in the following subchapters.

Section	**Table**	**Description**	**Segmentation variables (long format)**	**Quantitative variables (wide format)**
General	G0	General information	/	LEI code Undertaking name Group LEI code Risks included in the IM Reporting currency Contact points Model change information
	G1	Approximations used to obtain the quantitative variables	/	Tables Segmentation Variables Quantitative variables approximated Rationale Explanation
Biometric risk	B0	General characteristics of the portfolio	LOB Country Gross/Net basis	Technical provisions net of risk margin Risk margin

Section	Table	Description	Segmentation variables (long format)	Quantitative variables (wide format)
			Business cohort	Capital at risk Premiums written Duration SCR (overall and for the different models reported in the qualitative questionnaire)
	B1	General and demographic characteristics of the portfolio	LOB Country Gross/Net basis Age bucket Sex Product biometric profile	Technical provisions net of risk margin Capital at risk Premiums written Duration SCRs (overall and for the different models reported in the qualitative questionnaire)
	B2	Historical information on mortality claims	LOB Country Age bucket Sex Historical year	Observed number of deaths Best estimate mortality rate Headcounts at start Headcounts at end Death claims paid gross Death claims paid net
	B3	Latest information on biometric KRIs and	Country Age	Probability of death Life expectancy

Section	Table	Description	Segmentation variables (long format)	Quantitative variables (wide format)
		risk class segmentation	Sex Risk class	
	B3.1	Biometric KRI internal model projection	Country Age Sex Risk class Percentile[1] Projection year	Probability of death Life expectancy
	B4	Modelling of simplified life insurance products	Country Age Sex Risk class Product type RFR Term	Technical provisions net of risk margin SCR (overall and for the different models reported in the qualitative questionnaire)
Lapse risk	L0	General characteristics of the portfolio	LOB Country Gross/Net basis Business cohort	Technical provisions net of risk margin Risk margin Surrender value Surrender strain

[1] For ease of reporting, the percentile variable in table B3.1 follows the "wide" format.

Section	Table	Description	Segmentation variables (long format)	Quantitative variables (wide format)
				Unit linked margin Avg guaranteed rate EPIFP Premiums written Duration SCR (overall and for the different models reported in the qualitative questionnaire)
	L1	More granular characteristics	LOB Country Gross/Net basis Age bucket Premium type Sum insured bucket Policy age bucket Distribution channel Product classification	Technical provisions net of risk margin Surrender value Surrender strain Unit linked margin Average guaranteed rate EPIFP Premiums written Duration SCR (overall and for the different models reported in the qualitative questionnaire)
	L2	Historical information on surrenders	LOB Country	Observed surrenders Best estimate surrender rate

Section	Table	Description	Segmentation variables (long format)	Quantitative variables (wide format)
			Age bucket Premium type Sum insured bucket Policy age bucket Distribution channel Product classification Year	Headcounts at start Headcounts at end Surrenders paid gross Surrenders paid net
	L3	Lapse risk KRI internal model projection	LOB Country Age bucket Premium type Sum insured bucket Policy age bucket Distribution channel Product classification Percentile[2] Projection year	Lapse probability Mass lapse shock

[2] For ease of reporting, the percentile variable in table L3 follows the "wide" format.

Section	Table	Description	Segmentation variables (long format)	Quantitative variables (wide format)
Expenses risk	E0	General characteristics of the portfolio	LOB Country Gross/Net basis Business cohort	Technical provisions net of risk margin Risk Margin Premiums written Duration SCR (overall and for the different models reported in the qualitative questionnaire)
	E1	More granular characteristics	LOB Country Gross/Net basis Product Classification Expenses Type Premium type	Technical provisions net of risk margin SCR (overall and for the different models reported in the qualitative questionnaire)
	E2	Historical information on expenses	LOB Country Product Classification Expenses type Premium type Year	Observed expenses Expected expenses Headcounts at start Headcounts at end

Section	Table	Description	Segmentation variables (long format)	Quantitative variables (wide format)
	E3	Expense risk KRI internal model projection	LOB Country Product classification Expenses type Premium type Percentile[3] Projection year	Projected amount of expenses Projected annual inflation rate

Dimension of the tables:

The PG will provide all the abovementioned tables in csv format with the maximum number of combinations, with the exception of G1, where each undertaking may require a different number of rows to exhaustively report the approximations adopted. For those combinations where the value of the quantitative variable is not applicable for any undertaking (e.g. unit linked margin for rows where LOB is different from 31), the cells will be pre-filled with the symbol "-".

Segmentation variables:

Each undertaking shall fill the table only for the combinations which are applicable, leaving the other cells blank.

For example, assuming that the undertaking A has life policies in 2 LOBs, 2 Countries and that includes the next 12–months in the future business in the calculation of the SCR, table B0 should have in principle 16 filled rows: 2 LOBs, times 2 Countries, times 2 rows to distinguish between gross and net rows, times 2 rows to distinguish between business within or outside of contract boundaries.

Quantitative variables:

[3] For ease of reporting, the percentile variable in table E3 follows the "wide" format.

For each row resulting from the applicable combinations of categorical variables explained above, all the quantitative variables shall be provided. In case some specific combinations are not applicable for the undertaking, the quantitative variables shall be left blank. Further details on how to consistently handle unavailable values can be found in paragraph 4.4 below.

When possible, in the following paragraphs, a reference to the QRTs is included in order to prevent ambiguity on the definition of quantitative variables. Nevertheless, the granularity of the QRTs, typically specified by the "CXXXX" code, may be different from the granularity required to fill the table, hence only the row code is referenced.

Illustrative example of template:

Assuming that the undertaking A mentioned above responded to the qualitative questionnaire having two separate models for calculating the SCR for biometric risks, table B0 should appear like the illustrative example below, where the yellow and red headers indicate the segmentation variables and the quantitative variables, respectively.

LoB_b	Country_c	gross_net_basis_z	business_cohort_w	BEL_b.c.z.w	Risk_margin_b.c.z.w	CaR_b.c.z.w	GWP_b.c.z.w	Duration_b.c.z.w	SCR_overall	SCR_1_b.c.z.w	SCR_2_b.c.z.w	SCR_3_b.c.z.w	SCR_4_b.c.z.w	SCR_5_b.c.z.w	SCR_6_b.c.z.w	SCR_7_b.c.z.w	SCR_8_b.c.z.w
30	all	gross	within_CB	2008	-	191	1001	30	137.2	87.5	84.0						
30	all	net	within_CB	2001	198	194	991	31.5	134.4	84.9	83.1						
30	all	gross	outside_CB	2009	-	201	999	29.5	138.6	83.1	90.1						
30	all	net	outside_CB	1988	200	207	1007	30	140.0	87.5	87.5						
29	all	gross	within_CB	1995	-	204	992	29	139.3	86.6	87.5						
29	all	net	within_CB	2021	195	201	1003	30	135.1	85.7	83.1						
29	all	gross	outside_CB	2011	-	199	1007	30	137.2	86.6	84.9						
29	all	net	outside_CB	2010	199	203	1014	30	132.3	80.5	84.9						
30	FR	gross	within_CB	992	-	94	500	30	78.4	51	47						
30	FR	net	within_CB	1004	98	99	492	31	77.6	49	48						
30	FR	gross	outside_CB	1009	-	101	501	29	79.2	49	50						
30	FR	net	outside_CB	980	104	96	503	30	76.8	49	47						
29	FR	gross	within_CB	1003	-	102	498	29	77.6	50	47						
29	FR	net	within_CB	1015	93	103	506	31	77.6	50	47						
29	FR	gross	outside_CB	1000	-	96	502	31	80.0	49	51						
29	FR	net	outside_CB	1001	102	102	508	30	76.8	47	49						
30	IT	gross	within_CB	1016	-	97	501	30	80.0	50	50						
30	IT	net	within_CB	997	100	95	499	32	77.6	49	48						
30	IT	gross	outside_CB	1000	-	100	498	30	80.8	47	54						
30	IT	net	outside_CB	1008	96	111	504	30	84.8	52	54						
29	IT	gross	within_CB	992	-	102	494	29	83.2	50	54						
29	IT	net	within_CB	1006	102	98	497	29	78.4	49	49						
29	IT	gross	outside_CB	1011	-	103	505	29	78.4	51	47						
29	IT	net	outside_CB	1009	97	101	506	30	76.0	46	49						

In summary, each combination of the various segmentation variables (in yellow) should be interpreted as a segment of the portfolio. The quantitative variables (in red) should be provided for all applicable segments, unless otherwise specified.

Hence, in principle the process to fill in the templates require subsetting the undertaking's portfolio of policies, filtering the relevant policies according to the characteristics identified by the

segmentation variables; then, for each subset of policies the quantitative variables shall be computed.

4.2 FURTHER SPECIFICATIONS FOR THE QUANTITATIVE VARIABLES

In most cases, the segmentation variables do not lead to an unambiguous level of granularity, such that the undertaking is able to provide the quantitative variable without performing any sort of aggregation or manipulation.

Depending on the granularity of the data available for the undertaking, three situations to fill in the templates can be identified.

Please consider that an undertaking could fall under different situations for different variables in the same template. In this case the undertaking should fill in the template according to situation A (or, if not possible, to situation B) for as many variables as possible, making use of the "all" value that was introduced for most of the segmentation variables.

To further clarify the recommended process that should be followed to fill in the templates, a practical illustrative example has been attached to this data request (please refer to *Example 1_How to fill in the templates.html* in the zip file: LURCS_Illustrative examples.zip).

Situation A: The database of policies covered by the relevant internal model, available to the undertaking, includes all segmentation and quantitative variables at policy level, or at HRG/ModelPoint/Cluster, that is equally or more granular than the one identified by the combination of segmentation variables.

As each row of the template identifies a segment of the company's portfolio of policies, for each segment:

1. The undertaking filters the DB selecting the policies that have the characteristics identified by the segmentation variables.
2. The undertaking computes the quantitative variables and fill in the template. The computation of the quantitative variable depends on its nature.

- For monetary absolute amounts (e.g. TP_without_RM, written_premiums in table B0 etc.) the undertaking should provide the quantitative variable as the sum of that variable for all its policies identified by the particular combination of the segmentation variables. For example, for the segmentation variables (LOB = 30 – With profit, country = Italy, gross_net_basis = gross, business_cohort = within_CB) the correct value of the TP_without_RM is equal to the sum of the technical provisions without risk margin, on a gross of reinsurance basis, of all the policies belonging to the with–profit LOB, written in Italy and that are within contract boundaries.
- For non–monetary amounts (e.g. unit–linked margin, average guaranteed rate in table L1, best estimate rate and estimated shock in tables B3, B3.1, L3, E3, etc.), the undertaking should provide the weighted average of the quantitative variable across all the policies identified by the particular combination of the segmentation variable, using the sum insured[4] as relevant weight driver. The sum insured shall be consistent with the calculation from template S.26.14.01[5] (C0060) defined in Annex II of the ITS. This means that the undertaking may fill in the same value of the quantitative variable for several combinations identified by the segmentation variable. In fact, two practical situations may arise:
  - **The quantitative variable is defined with a greater granularity than the segmentation variables:**

    For example, assuming that an undertaking, for a given combination of the segmentation variables in table L3 identifies the following 3 different BEL clusters (because it considers in the BEL cluster definition the variable "minimum guaranteed rate" not considered in table L3):

lob	country	age bucket	premium type	sum insured bucket	policy age bucket	distribution channel	product classification	projection year	minimum guaranteed rate
30	country_1	0-39	single	[0,100k)	0	direct	single life	1	0%
									0%-2%
									>2%

    The BEL lapse probability to be provided is the weighted average of the BEL lapse probabilities of these 3 BEL clusters, using the sum insured as weight[6], as in the tables below:

lob	country	age bucket	premium type	sum insured bucket	policy age bucket	distribution channel	product classification	projection year	minimum guaranteed rate	sum assured	lambda BE
30	country_1	0-39	single	[0,100k)	0	direct	single life	1	0%	100	3,0%
									0%-2%	200	2,0%
									>2%	100	4,0%

lob	country	age bucket	premium type	sum insured bucket	policy age bucket	distribution channel	product classification	projection year	lambda BE
30	country_1	0-39	single	[0,100k)	0	direct	single life	1	2,75%

- **The quantitative variable in the undertaking's system is defined with a lower granularity than the segmentation variables**

  For example, table L3 requires the lapse probability for each combination of 10 segmentation variables. Let's consider undertaking A mentioned in paragraph Terminology characterized by 12 Lapse BEL clusters and 2 Lapse level SCR clusters.

  Considering only the projection year equal to 1, undertaking A will have 12 different values of BE lapse probability and just 2 different values of 99,5% lapse shock. Therefore, in table L3 undertaking A will repeat these 14 values for all combinations of segmentation variables. Table L3 should appear like the illustrative example below:

lob	country	age bucket	premium type	sum insured bucket	policy age bucket	distribution channel	product classification	projection year	lambda BE	...	lambda level 0.995
30	country_1	0-39	single	[0,100k)	0	direct	single life	1	2,4%	...	20%
31	country_1	0-39	single	[0,100k)	0	direct	single life	1	3,2%	...	13%
30	country_1	0-39	single	[0,100k)	1	direct	single life	1	3,3%	...	20%
31	country_1	0-39	single	[0,100k)	1	direct	single life	1	2,1%	...	13%
30	country_1	0-39	single	[0,100k)	2	direct	single life	1	5,7%	...	20%
31	country_1	0-39	single	[0,100k)	2	direct	single life	1	6,5%	...	13%
30	country_1	0-39	single	[0,100k)	3	direct	single life	1	8,2%	...	20%
31	country_1	0-39	single	[0,100k)	3	direct	single life	1	7,7%	...	13%
30	country_1	0-39	single	[0,100k)	4	direct	single life	1	3,5%	...	20%
31	country_1	0-39	single	[0,100k)	4	direct	single life	1	2,8%	...	13%
30	country_1	0-39	single	[0,100k)	5	direct	single life	1	5,5%	...	20%
31	country_1	0-39	single	[0,100k)	5	direct	single life	1	4,1%	...	13%
...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...
Considering only the projection year equal to 1, Undertaking B will repeat these 14 values (in red) for all combinations of segmentation variables											

Situation B: In the database of policies covered by the relevant internal model, available to the undertaking, only segmentation variables are available at policy level. The quantitative variables are available only at HRG/ModelPoint/Cluster level, which has a different granularity than the data request.

In this case, provided that the undertaking knows which policy belongs to which HRG/ModelPoint/Group, step 1., which is the filtering of the DB according to the segments identified by the segmentation variables, the process can still be performed analogously to scenario A. Regarding step 2., the computation of the quantitative variables can be performed with minimal or no approximation.

In detail:

[4] If deemed more appropriate, the undertaking may use different variables to perform the weighted average; this should be flagged in table G1.

[5] This template is introduced with the Taxonomy 2.8.0.

[6] Or any other weight driver deemed relevant by the undertaking, to be reported in template G1.

1) The undertaking filters the DB selecting the policies that have the characteristics identified by the segmentation variables.
2) The undertaking computes the quantitative variables and fill in the template. The computation of the quantitative variable depends on its nature.
   a) For monetary absolute amounts (e.g. TP_without_RM, written_premiums in table B0 etc.) , if the undertaking is not able to perform the calculation specified in scenario A, the undertaking can use meaningful approximations to allocate the quantitative variable at Cluster level to each policy based on easily available undertaking-specific volume measures (the suggested measure is the sum insured, however any other relevant drivers, e.g. the mathematical reserve, can be used). All the approximations used should be reported in the table G1.

   b) For non–monetary amounts (e.g. unit–linked margin, average guaranteed rate in table L1, best estimate rate and estimated shock in tables B3, B3.1, L3, E3, etc.), the undertaking should provide the weighted average of the quantitative variable across all the policies identified by the particular combination of the segmentation variable, using the sum insured (or any other relevant weight driver, to be reported in G1, deemed appropriate) as weight.

Situation C: In the database available to the undertaking, neither the quantitative variables nor some of the segmentation variables are available in a granularity that is equal or greater than the LURCS template. For example, only the following information is available to the undertaking, without the possibility to map individual policies to the clusters nor to the LURCS_segments.

In this case, given the unavailability of the segmentation variables in the necessary granularity, the undertaking could use the “all” value introduced in the LURCS templates or a materiality-based approximation can be performed (and reported in template G1) in case for example an undertaking cluster has a granularity that is very close but not exactly identical to the granularity required by the LURCS segment. For the segments without the “all” value and where the undertaking cannot meet the necessary level of granularity, the undertaking should fill in “NP”, standing for “not possible”. For a consistent handling of unavailable values, please refer to paragraph 4.4 below.

4.3 THE USE OF APPROXIMATIONS

The data request has been designed to fulfil the principles of proportionality, relevance and availability. Nevertheless, it is possible that some internal models are not capable of producing exact data at the required granularity level of the data request.

To tackle this challenge while ensuring an optimal quality and meaningfulness of the requested data, an "all" value has been included and shall be filled in for most of the segmentation variables, allowing the participants with internal models that cannot produce some of the data at the required granularity to flexibly provide also the "marginal" total of this data without distinguishing between the possible values of the segmentation variables.

The possibility to provide "marginal" totals is meant to accommodate the internal models that cannot produce some of the data at the required granularity by design. The undertakings are still required to submit all the data that are possible to produce either directly or either with approximations at the required granularity defined by the segmentation variables, including the rows with the "all" value.

To this purpose the project group has analysed the comments shared by the participants during the consultation period as well as the relevant regulation and has set the following expectations for the use of approximations depending on the template and variables considered.

The overall data request and the expectations set for approximations concern mostly data that undertakings are expected to already have available or to be able to easily produce, based on key elements of the relevant regulation such as Use Test, Validation Standards, Calibration Standards, Statistical Quality Standards and the data requirements for technical provisions and internal models.

Table	Segmentation variables (excluding the rows corresponding to the "all" value)	Quantitative variables	Expected level of approximations	Non-exhaustive legal references
Level 0	Country/LOB	All	None	Article 224 SII DA
	Other than Country and LOB	All	Minimal	
Level 1	All	All except SCRs and TP-related	Minimal	Article 19, Article 34.3, Article 35, Article 260.3, Article 272, Article 264.3 of Solvency II Delegated Acts; Article 124 of Solvency II Directive
		TP-related	Moderate	
		SCRs	Significant	
Level 2	All	All	Minimal	
Level 3	All	All	Minimal	Article 242.1 of Solvency II Delegated Acts; Article 122.4 of Solvency II Directive; paragraph 11 of EIOPA-BoS-15/083
Level 4	All	All	Minimal	

Minimal approximations involve proxies expected to yield results very close to the requested value, if it was accurately calculated, using quantities that are already available without the need for additional "runs". For example, in table B1, the theoretically exact calculation of the duration variable requires the consolidation of cash flows for each required portfolio segment; this may be approximated by aggregating durations already available at different granularities using relevant weights or by performing alternative calculations (e.g. numerical calculation of the duration via an interest rate sensitivity). Another example is the production of average lapse probabilities in table L3, the average is required to be weighted by sum assured, however the undertaking may use a different weight if deemed more appropriate, still achieving a meaningful "average" value for the portion of the portfolio identified by the segmentation variables.

Moderate approximations concern approximations of quantities that the undertaking would not be able to calculate accurately without several additional runs of the technical provision actuarial model; for example in tables B1, L1, E1, the TP_without_RM variable at the lowest levels of granularity can be approximated allocating the same variable accurately reported in B0, L0, E0 at LOB and Country level, with the use of an already available allocation driver deemed relevant by the undertaking (e.g. the mathematical reserve).

Significant approximations are related to approximations where the accurate calculation would be impossible to perform at the granularity requested, and the proxy can lead to results that are directionally valid, although with significant uncertainty regarding its appropriateness. For example, in tables B1, the SCR at LOB/Country/Age/Sex level may be approximated allocating the SCR at LOB/Country level reported in B0 using the technical provision as a relevant weight driver.

Nevertheless, where a significant level of approximations is expected, the undertaking should proceed according to the following rules:

- If the data can be allocated or provided by the use of a reasonable and non-artificial proxy, the undertaking should use the latter to fill the template and report the approximation used in the template G1.
- If the data cannot be allocated or provided by the use of a reasonable and non-artificial proxy, the undertaking should fill the cells corresponding to the segmentation variables that define the granularity level that is impossible to be produced by its internal model with the value "NP", which stands for "not possible". For instance, undertakings should fill "NP" in tables L3 or E3 in case their model is not able to provide a value for some of the percentiles of the risk driver distribution; another example where "NP" may be necessary is in tables B1, L1 and E1 in case the SCR cannot be meaningfully allocated nor approximated in case of the significant interaction of assets and liabilities, i.e. for the LOB 30 and 31.

4.4 UNAVAILABLE VALUES

This paragraph summarises the ways, further outlined throughout the technical specifications, in which undertakings shall consistently report their unavailable values, if any.

There are four types of unavailable values:

1. **A value that is unavailable because the undertaking's internal model does not cover the risk at all.** In this case, no templates related to this risk shall be returned and the template G0 shall be filled accordingly. For example, if an undertaking's internal model covers only biometric risks, the templates L-X and E-X shall not be filled-in nor returned and in the template G0 the undertaking should fill in "no" for the variables "lapse_risk", "expense_risk" and "yes" for the variable "biometric_risk".
2. **A value that is unavailable because it is not applicable for any undertakings.** In this case, nothing should be done by the undertaking as the cells corresponding to values that are not expected to be filled-in by any undertakings are already filled with a dash ("-") in the templates shared with them; in fact, these have been included merely due to technical reasons regarding the structure of the templates. For example, in tables B0, L0, E0, the risk margin quantitative variable is already filled with ("-") where the segmentation variable "gross_net_basis" is equal to "gross".
3. **A value that is unavailable because it is not applicable for a specific undertaking.** In this case, such undertaking should leave the cells as they already are, namely empty. For example, if an undertaking's internal model covers business related only to one country, any quantitative variable should be left empty in the cells corresponding to the rows where the segmentation variable "country_c" is equal to "Country_2", "Country_3" etc. Another example concerns table B3.1: if the undertaking's internal model does not model at all, for instance, volatility risk, the quantitative variables q_c,x,s,r,p,T_volatility and e_c,x,s,r,p,T_volatility shall remain empty.
4. **A value that is unavailable because the undertaking cannot meet the level of granularity required and no meaningful approximation[7] can be provided.** In this case the undertaking should fill in the cells with "NP", standing for "not possible". For example, if in table B1 an undertaking cannot produce nor meaningfully approximate the SCRs for specific values of the segmentation variable "age_bucket", the corresponding cells of the quantitative variables SCR_overall, SCR_1 etc. should be filled-in with the two letters "NP".

[7] See paragraph 4.3

4.5 GENERAL TABLES

4.5.1 G0 – General information

In this table, the undertakings shall provide general information needed for the overall submission. Below the headers, only one row shall be filled with the following information:

- **LEI_code** – *Legal Entity Identification code* of the undertaking at reporting date
- **entity_name** – *Undertaking name* at reporting date
- **LEI_group –** *Group Legal Entity Identification code*
- **currency_code** – ISO 4217 alphabetic code of the reporting currency. See 3 References and conventions.
- **contact_points –** email addresses of the points of contact at the undertaking. If more than one contact point available, please use ";" as separator between the email addresses.
- **biometric_risk –** Fill *yes* if the undertaking uses an approved internal model for mortality and/or longevity risk, *no* otherwise.
- **biometric_first_approval –** year of first approval of the biometric risks model.
- **biometric_n_mmc –** number of major model changes since first approval of the biometric risk models.
- **biometric_last_mmc –** year of last major model change for biometric risk models.
- **lapse_risk –** Fill *yes* if the undertaking uses an approved internal model for life lapse risk, *no* otherwise.
- **lapse_first_approval –** year of first approval of the lapse risk model.
- **lapse_n_mmc –** number of major model changes since first approval of the lapse risk model.
- **lapse_last_mmc –** year of last major model change for lapse risk model.
- **expense_risk –** Fill *yes* if the undertaking uses an approved internal model for life expenses risk, *no* otherwise.
- **expense_first_approval –** year of first approval of the expense risk model.
- **expense_n_mmc –** number of major model changes since first approval of the expense risk model.
- **expense_last_mmc –** year of last major model change for expense risk model.

4.5.2 G1 – Approximations

In this table, the undertakings shall provide information regarding the approximations, if any, that were used to fill the other templates.

The required fields are as follows:

- **table –** the table where the proxy is applied;
- **segmentation_variables –** the segmentation variables used in the proxy (if more than 1, they should be separated by a semicolon);
- **quantitative_variable_approximated** – the quantitative variable that is approximately calculated;
- **rationale –** the reason why the proxy was necessary;
- **explanation** – the detailed description of the proxy.

Please insert as many rows as necessary to exhaustively explain all the approximations adopted. The following table provides an illustrative example of how the template should be filled.

Table	Segmentation_variables	Quantitative_variable_approximated	Rationale	Explanation
B1	age;sex	SCR_1;SCR_2;SCR_overall	The internal model produces output at segregated fund level, making it impossible to produce SCR numbers with a breakdown based on age and sex	The SCR at Country, LoB was allocated to sex/age bucket according to the mathematical reserve

4.6 BIOMETRIC RISKS

This section defines the technical specifications of the quantitative information regarding undertakings that use an internal model covering biometric risk, namely mortality and longevity (sub–)risks.

4.6.1 B0 – General characteristics of the portfolio

In this table, the undertakings shall provide information regarding the general characteristics of the portfolio that is covered by the internal model.

Segmentation variables:

- **lob_b** – *Solvency II line of business* for life insurance and reinsurance obligations, as defined in Annex I of the Solvency II Delegated Acts. Possible values are 29, 30, 31, 32, 33, 34, 35, 36
- **country_c** – country where the risk was underwritten, which might not coincide with the country where the undertaking is based. Possible values are the ISO 3166-1 alpha-2 country codes of all the countries where the undertaking underwrites policies covered by the internal model and "all". The top 10 countries, in terms of overall technical provisions, shall be reported separately.

- **gross_net_basis_z** – *gross or net of risk mitigation techniques*. Possible values are "gross", "net"
- **business_cohort_w** – *existing business* (within contract boundaries) *or new business* (outside of contract boundaries) expected to be written over the following 12 months pursuant Art. 101 Solvency II Directive. Possible values are "within_cb", "outside_cb"

Quantitative variables:

- **TP_without_RM** – *Technical provisions without the risk margin*, consistent with the calculations from QRT S.12.01. For each level of granularity stemming from the combination of the qualitative (segmentation) variables, the gross value shall correspond to *Technical provisions calculated as a whole* + *Gross Best Estimate* (R0010 + R0030), while the net value shall correspond to *Technical provisions calculated as a whole* + *Gross Best Estimate* – *Total recoverables from reinsurance/SPV and Finite Re after the adjustment for expected losses due to counterparty default* (R0010 + R0030 – R0080).
- **Risk_margin** – *Risk margin*, "such as to ensure that the value of the technical provisions is equivalent to the amount that insurance and reinsurance undertakings would be expected to require in order to take over and meet the insurance and reinsurance obligations", as defined in Article 77(3) of the Solvency II Directive, consistent with the calculation from template S.12.01 (R0100) defined in Annex II of the ITS. The risk margin shall be provided only on a net of reinsurance basis.
- **CaR** – *Capital at Risk*, "meaning the sum over all contracts of the higher of zero and the difference between the following amounts:

(i) the sum of:

— the amount that the insurance or reinsurance undertaking would currently pay in the event of the death of the persons insured under the contract after deduction of the amounts recoverable from reinsurance contracts and special purpose vehicles;

— the expected present value of amounts not covered in the previous indent that the undertaking would pay in the future in the event of the immediate death of the persons insured under the contract after deduction of the amounts recoverable from reinsurance contracts and special purpose vehicles;

(ii) the best estimate of the corresponding obligations after deduction of the amounts recoverable form reinsurance contracts and special purpose vehicles;", as defined in Article 91 of the Solvency II Delegated Acts, consistent with the calculation from template S.14.01 (C0190) defined in Annex II of the ITS.

- **WP** – *Premiums written*, where:

"gross premiums written shall comprise all amounts due during the reporting period in respect of insurance contracts, arising from gross business, regardless of the fact that such amounts may relate in whole or in part to a later reporting period. It includes both direct and reinsurance business", as defined in Annex II of the ITS, consistent with the calculation from template S.05.01 (R1410), and

"net premiums written represent the sum of the direct business and the accepted reinsurance business reduced by the amount ceded to reinsurance undertakings" as defined in Annex II of the ITS, consistent with the calculation from template S.05.01 (R1500).

- **Duration** – the *Macaulay duration*[8] of the insurance liabilities, namely the variable TP_without_RM. The duration shall be computed aggregating the cash flows of the portfolio identified by the segmentation variables.
- **SCR_overall** – *Solvency Capital Requirement* (SCR), as defined in Article 101 of the Solvency II Directive, for the biometric risk, covering all mortality and longevity (sub)risks that are calculated separately by the undertaking. SCR_overall takes into account the diversification within (sub-)risks SCR_1, …, SCR_7. In the unlikely case that the undertaking's internal model cannot produce as output the aggregated overall biometric risk SCR, an estimate can be included and reported in template G1. In this case the suggested methodology is to provide an estimate based on the Undertaking's own aggregation method, assuming all the non-biometric SCRs to be equal to zero.
- **SCR_1, …, SCR_7** – Various biometric *Solvency Capital Requirements* that the undertaking models separately. Each of these values (for instance SCR_1) is calculated without considering the diversification effect between itself (SCR_1) and the other (sub-)risks (SCR_2, … SCR_7). The number of filled columns shall be consistent with the answer provided by the undertaking in the qualitative biometric risk survey.

  For instance, if the undertaking has answered in the qualitative survey that the internal model produces two SCR outputs, one for longevity (sub–)risks and one for mortality (sub–)risks, the undertaking shall provide numerical values for the columns SCR_1 and SCR_2, while leaving all cells in columns SCR_3, … SCR_7 blank.

4.6.2 B1 – General and demographic characteristics

Table B1 broadens the scope of the information collected in the previous table by further refining the granularity introducing simple demographic features, such as age and sex, that characterize a *simplified biometric model point* (SBMP).

[8] The Macaulay duration is defined as the weighted average of the time to occurrence of each cash flow t_j , with weights equal to the present value of future cash flows $D = \frac{\sum_j CF_j v(0,j) t_j}{\sum_j CF_j v(0,j)}$. For the calculation of the duration of the insurance liability, the cash flows shall be weighted with the probability of their occurrence.

Segmentation variables:

- **lob_b** – see B0 – General characteristics of the portfolio
- **country_c** – see B0 – General characteristics of the portfolio Only the top 5 countries (in terms of overall technical provisions) shall be considered.
- **gross_net_basis_z** – see B0 – General characteristics of the portfolio
- **age_bucket_x** – *insured person age bucket at year-end 2023*. Possible values are "0–17", "18–39", "40–59", "60–79", "80+", "all".
- **sex_s** – *insured person's sex*. Possible values are "male", "female", "all".
- **product_biometric_profile_y** – *biometric profile of the policies*. Possible values are "primarily_mortality", "primarily_longevity", "neither", "all"
  The rationale is that each undertaking, for each LOB, may have multiple heterogeneous products. Therefore, the aim is to introduce an additional, though simple, level of granularity based on a common ground: the undertaking's self–assessment of whether a product is primarily exposed to mortality or primarily exposed to longevity risk. For instance, considering a portfolio of LOB 30 (With–Profit) policies, these might include annuities, endowment, term life products, each with several options. Hence, the undertaking should be able to further segment its portfolio, within LOB, according to which products are primarily exposed to mortality or longevity risk. This self–assessment shall be performed on a net of risk mitigation benefit basis.

Quantitative variables:

- **TP_without_RM**
- **CaR**
- **WP**
- **Duration**
- **SCR_overall**
- **SCR_1, …, SCR_7**

For the explanation of the quantitative variables, please see B0 – General characteristics of the portfolio, since all the variables are included in the B0 table.

4.6.3 B2 – Historical information on mortality claims

In this table, undertakings are required to provide historical data on simple quantitative mortality aspects, such as the observed and expected frequency and severity of death claims. The aim is to obtain information on the undertaking risk profile and the variability of biometric risk.

Segmentation variables:

- **lob_b** – see B0 – General characteristics of the portfolio;

- **country_c** – see B0 – General characteristics of the portfolio. Only the top 5 countries (in terms of overall technical provisions) shall be considered.
- **age_bucket_x** – see B1 – General and demographic characteristics;
- **sex_s** – see B1 – General and demographic characteristics;
- **year_t** – *historical calendar year*. Possible values are the last 7 years since the reference year end date. In case the undertaking is not able to retrieve all the information required by the quantitative variables for 7 years, only the number of years for which such information is available shall be completed. Undertakings are expected to provide at least 5 years of data

Quantitative variables:

- **observed_number_deaths** – number of death claims incurred in the year t
- **best_estimate_mortality_rates** – best estimate mortality rates for the 1st year of projection assumed in t-1. In table G1 it shall be reported the methodology used to derive the assumptions (for instance based on number or amount)
- **headcounts_at_start** – number of policyholders at the beginning of year t
- **headcounts_at_end** – number of policyholders at the end of year t
- **claims_paid_gross** – total death claims paid, gross of risk mitigation techniques, in year t. Death claims shall not include payments related to survivor pensions or annuities.
- **claims_paid_net** – total death claims paid, net of risk mitigation techniques, in year t. Death claims shall not include payments related to survivor pensions or annuities.

4.6.4 B3 – Latest information on biometric KRIs and risk class segmentation

In this table, undertakings are asked to provide the level information on two key biometric risk indicators, namely probability of death and life expectancy for a set of *enhanced biometric model points* (EBMP). The EBMP are based on the SBMP defined in B1, but they comprise the so–called risk class, a variable that summarizes all the possible adjustment factors that each undertaking may apply to amend upwards or downwards the probability of death of a given SBMP. This will be further explained in the following paragraph.

Segmentation variables:

- **country_c** – see B0 – General characteristics of the portfolio. Only the top 5 countries (in terms of overall technical provisions) shall be considered.
- **age_x** – *insured person's age*, in years. Possible values are 0, 20, 40, 50, 65, 80
- **sex_s** – see B1 – General and demographic characteristics. Possible values are "male", "female"

- **risk_class_r** – *mortality risk class*. This variable defines the percentile of the empirical distribution of the mortality rates corresponding to the three segmentation variables listed above. Possible values are 5, 25, 50, 75, 95.[9]

  The process of selection of the corresponding EBMP is described through an example in the following paragraph and outlined in a practical illustrative example that has been attached to this data request (please refer *to Example 2_How to identify the risk class.html* in the zip file: LURCS_Illustrative examples.zip).

  The identified EBMPs shall be used also in table B3.1.

Quantitative variables:

- **q_c,x,s,r** – probability of an insured person of country c, age x, sex s and risk class r to die within a year
  This is the quantile function of the empirical distribution of q_c,x,s, computed in the probabilities defined in the risk_class_r. Please use the following definition of the quantile function:

$$F^{-1}(x) = inf\{x \in \mathbb{R} : T(x) \geq p\}, p \in [0,1]$$

  In practice, to retrieve the probability corresponding to the r^{th} risk class, the undertaking should identify all policies in their portfolio with fixed country c, age x and sex s and extract the corresponding one-year BE mortality rates. Once the mortality rates are sorted increasingly, the 5^{th}, 25^{th}, 50^{th}, 75^{th} and 95^{th} percentiles of the distribution should be identified and reported.
- **e_c,x,s,r** – *cohort life expectancy*, or the average number of additional years a person would live considering assumed future changes in mortality for their cohort over the remainder of their life, of the same insured person (country c, age x, sex s and risk class r) identified on the basis of the q_c,x,s,r
  The requested data correspond to the cohort life expectancy of the EBMP identified above.

Both the q and the e shall refer to the latest available information based on the reference date of the comparative study, namely the best estimate basis as at year end 2023.

[9] Given the different possible modelling choices and granularities of the participating undertakings, it is not possible to identify a unique set of selection variables (e.g. smoker, post code, etc.) used by each of the undertakings to discriminate the mortality risk among their policies. Therefore, to understand the portfolio composition of the participating undertakings, an alternative method, based on empirical percentiles, was introduced.

Example of selection of the enhanced biometric model points

For the same SBMP, e.g. Italian 50-year-old male, a given undertaking may have, depending on the granularity of their modelling choices and the complexity of their portfolio, several insured people with very different mortality risk profile.

For example, undertaking A has 4 different BEL clusters related to an Italian 50-year-old male, sort in ascending order for Best estimate assumptions ($qBE_{\_Italy,50,male}$):

1. Bel cluster 1: Italian 50-year-old male, non–smoker, who purchased an annuity. Undertaking A assumes a $qBE_{\_Italy,50,male,HRG1}$ equal to 0,19%;
2. BEL cluster 2: Italian 50-year-old male, non–smoker, who purchased a term contract. Undertaking A assumes a $qBE_{\_Italy,50,male,HRG2}$ equal to 0,22%;
3. BEL cluster 3: Italian 50-year-old male, smoker, who purchased an annuity. Undertaking A assumes a $qBE_{\_Italy,50,male,HRG3}$ equal to 0,29%;
4. BEL cluster 4: Italian 50-year-old male, smoker, who purchased a term contract. Undertaking A assumes a $qBE_{\_Italy,50,male,HRG4}$ equal to 0,35%.

Let's assume that undertaking A has 10.000 Italian 50-year-old males policyholders distributed as follows:

1. BEL cluster 1: 3000 policyholders;
2. BEL cluster 2: 5000 policyholders;
3. BEL cluster 3: 500 policyholders;
4. BEL cluster 4: 1500 policyholders.

Undertaking A should sort its 10.000 policyholders in ascending order for Best estimate assumptions. The percentiles 5, 25, 50,75 and 95 of this distribution (risk classes), will be the 5 EBMP related to an Italian 50-year-old male policyholders.

The following table illustrates the process of selection.

	SBMP	BEL cluster	$qBE_{\_SMP,BEL\ cluster}$	Percentile
1	Italy, 50-year-old, male	BEL cluster 1	0,19%	
…	…	…	…	
500	Italy, 50-year-old, male	BEL cluster 1	0,19%	5
…	…	…	…	
2500	Italy, 50-year-old, male	BEL cluster 1	0,19%	25
…	…	…	…	
3000	Italy, 50-year-old, male	BEL cluster 1	0,19%	
3001	Italy, 50-year-old, male	BEL cluster 2	0.22%	
…	…	…	…	
5000	Italy, 50-year-old, male	BEL cluster 2	0.22%	50
…	…	…	…	
7500	Italy, 50-year-old, male	BEL cluster 2	0.22%	75
…	…	…	…	
8000	Italy, 50-year-old, male	BEL cluster 2	0.22%	
8001	Italy, 50-year-old, male	BEL cluster 3	0,29%	
…	…	…	…	
8500	Italy, 50-year-old, male	BEL cluster 3	0,29%	
8501	Italy, 50-year-old, male	BEL cluster 4	0.34%	
…	…	…	…	
9500	Italy, 50-year-old, male	BEL cluster 4	0.34%	95
…	…	…	…	
10000	Italy, 50-year-old, male	BEL cluster4	0.34%	

The resulting reported values should be:

country_c	age_x	sex_s	risk_class_r	q_cxsr
IT	50	male	5	0.19%
IT	50	male	25	0.19%
IT	50	male	50	0.22%
IT	50	male	75	0.22%
IT	50	male	95	0.34%

4.6.5 B3.1 – Biometric KRI internal model projection

Leveraging on the identification of the EBMP required to complete table B3, in this table, undertakings shall provide their internal model projections for two key risk drivers of biometric risk, namely the probability of death and life expectancy.

Segmentation variables:

- **country_c** – see B0 – General characteristics of the portfolio. Only the top 5 countries (in terms of overall technical provisions) shall be considered.
- **age_x** – see B3 – Latest information on biometric KRIs and risk class segmentation
- **sex_s** – see B1 – General and demographic characteristics, possible values are "male", "female".
- **risk_class_r** – see B3 – Latest information on biometric KRIs and risk class segmentation
- **percentile_p** – percentile of the distribution of the KRI to which the internal model projections are referred to. Possible values are "best_estimate", 0.10%, 0.50%, 1.00%, 5.00%, 10.00%, 25.00%, 50.00%, 75.00%, 90.00%, 95.00%, 99.00%, 99.50%, 99.90% [10]
- **projection_year_T** – projection year. Possible values are 0, 1, 2, 3, 4, 5, 10, 15, 20, 25, 30, 50, 100

Quantitative variables:

- **q_c,x,s,r,p,T** – probability of a policyholder of country c, age x as at year end 2023, sex s, risk class r to die within a year according to the percentile p of internal model projection after T years
- **e_c,x,s,r,p,T** – cohort life expectancy of a policyholder of country c, age x as at year end 2023, sex s, risk class r, according to the percentile p of the internal model projection after T years.

For clarity, **q_x,T** is the 1 year death probability calculated after T years of projections, for an individual aged x at the start of the projection (the usual actuarial notation is ${}_{T|}q_x$ where the | symbol indicates a time deferment) and therefore being aged X+T in year T.

The quantitative variables shall be provided according to the following table:

[10] For ease of reporting, the percentile variable in table B3.1 follows the "wide" format.

Data	KRI	Format	Applicable projection years	Applicable percentiles
A - best estimate	q_c,x,s,r,p,T_BE	Probability, expressed in unit	All positive[11]	best_estimate
	e_c,x,s,r,p,T_BE	Absolute number, expressed in years	0	
B - estimated change compared to the BE for trend risk only	q_c,x,s,r,p,T_trend	Shock, expressed in unit	All positive[12]	All numeric
	e_c,x,s,r,p,T_trend	Absolute number, expressed in years	0	
C - estimated change compared to the BE for level risk only	q_c,x,s,r,p,T_level	Shock, expressed in unit	1	All numeric
	e_c,x,s,r,p,T_level	Absolute number, expressed in years	0	
D - estimated change compared to the BE for volatility risk only	q_c,x,s,r,p,T_volatility	Shock, expressed in unit	1	All numeric
	e_c,x,s,r,p,T_volatility	Absolute number, expressed in years	0	
E - estimated life CAT shock	q_c,x,s,r,p,T_cat	Shock, expressed in deaths per mille	1	All numeric

[11] Applicable only to combinations where the sum between projection year and policyholder age does not exceed 120.

[12] Applicable only to combinations where the sum between projection year and policyholder age does not exceed 120.

For "estimated changes compared to the BE" it is meant the formula: X/BE-1 where X is the shocked value of the risk driver. For instance, the estimated changes compared to the BE under the Standard Formula are 0.15 (99.5^{th} percentile of the qx) and -0.20 (0.5^{th} percentile of the qx).

For "estimated changes compared to the BE" expressed in "years" it is meant X-BE where X is the shocked value of the life expectancy and BE is the best estimate of the life expectancy.

For "estimated life CAT shock" expressed in "deaths per mille" it is meant X-BE where X is the shocked value of the probability of death and BE is the best estimate of the probability of death. For instance, under the SF, this value is 1.5.

For *volatility risk* it is meant the stochastic risk of individuals dying earlier or later than expected, namely the risk of experiencing more/less deaths due to natural statistical fluctuation around expected values.

For *level risk* it is meant the risk of misestimation of the current level of mortality for a given population.

For *trend risk* it is meant the risk of permanent misestimation of future trends in the mortality.

For *cat risk* it is meant the risk of a one-time, large-scale mortality event affecting a multitude of policyholders.

Undertakings that do not model at all any of the abovementioned sub-risks shall leave cells, relative to the estimate change in the risk driver for those sub-risks, blank.

Undertakings that model together any of the abovementioned sub-risks, shall provide an estimate of the change in the risk driver for each those sub-risks.

Undertakings may have two different modelling approaches for mortality and longevity, for example trend risk may be modelled for longevity only. In this case, the undertaking shall provide the estimate change in the risk driver only for the relevant percentiles (below 50 in case of longevity, above 50 in case of mortality).

Undertakings that have a unique model for both mortality and longevity (e.g. a Lee-Carter), without a granular modelling at level/trend/volatility sub-risk level, typically are modelling only trend risk and therefore shall provide the estimate change in the risk driver only for trend risk.

Undertakings that model any of the abovementioned sub-risks on the basis of monetary amounts and not KRIs (e.g. volatility risk is modelled on the volatility of losses rather than on the volatility of a q_x) shall leave blank the cells relative to the quantitative variables for those sub-risks.

4.6.6 B4 – Modelling of simple life insurance products

In this table, the scope of the data request is finally broadened with the inclusion of commercial specifications. The undertakings will have to provide simple Solvency II metrics, calculated with the internal model, for a set of *commercial biometric model points* (CBMP) which, alongside the characteristics of the EBMP identified previously, will encompass characteristics of simplified, standard, life products.

Differently from the tables above, where a combination of all the segmentation categorical variables is required, in this table each product type is applicable only to a meaningful subset of the EBMP. In addition, for the computation of the quantitative variables, further information, such as the policy term and interest rate curve to be used for discounting, are provided. The combination of segmentation variables and further information on the products are specified in paragraph 5.1 below. The interest rate curves to be used are listed in paragraph 5.2 RFR specifications.

Segmentation variables:

- **country_c** – see B0 – General characteristics of the portfolio. Only the top 5 countries (in terms of overall technical provisions) shall be considered.
- **age_x** – see B3 – Latest information on biometric KRIs and risk class segmentation
- **sex_s** – see B1 – General and demographic characteristics
- **risk_class_r** – see B3 – Latest information on biometric KRIs and risk class segmentation
- **product_type** – type of product that shall be modelled. Possible values are “term”, “pure endowment”, “immediate annuity”, “deferred annuity”. A further specification of the products is provided in paragraph 5.1 Product specifications.
- **rfr_i** – risk–free interest rate curve that shall be used in the calculation of the quantitative variables. Possible values are “rfr_1”, “rfr_2”, “rfr_3”. The specification of these interest rates curves is provided in paragraph 5.2 RFR specifications).
- **term** – policy validity in years. Consider it as a new contract. Possible values are “1”, “10”, “20”, “lifetime”.

Quantitative variables:

- **TP_without_RM –** see B0 – General characteristics of the portfolio
- **SCR_overall** – see B0 – General characteristics of the portfolio
- **SCR_1, …, SCR_7** – see B0 – General characteristics of the portfolio

4.7 LAPSE RISK

4.7.1 L0 – General characteristics of the portfolio

In this table the undertaking shall provide information regarding the general characteristics of the portfolio that is covered by the internal model(s) related to lapse risk(s).

Segmentation variables:

- **lob_b** – see B0 – General characteristics of the portfolio
- **country_c** – see B0 – General characteristics of the portfolio
- **gross_net_basis_z** – see B0 – General characteristics of the portfolio
- **business_cohort_w** – see B0 – General characteristics of the portfolio

Quantitative variables:

- **TP_without_RM** – see B0 – General characteristics of the portfolio
- **Risk_margin** – see B0 – General characteristics of the portfolio
- **Surrender_value** – *Surrender value*, "amount to be paid to the policyholder in case of early termination of the contract (i.e. before it becomes payable by maturity or occurrence of the insured event, such as death), net of charges and policy loans; does not concern contracts without options, given that surrender value is an option", consistent with the calculation from template S.14.01 (C0200) defined in Annex II of the ITS.
- **Surrender_strain –** *Surrender strain*, "the difference between the following: (a) the amount currently payable by the insurance undertaking on discontinuance by the policy holder, net of any amounts recoverable from policy holders or intermediaries; (b) the amount of technical provisions without the risk margin", as defined Article 99(3) of the Solvency II Delegated Acts, consistent with the calculation from template S.26.07.01 (C0140) defined in Annex II of the ITS.
- **Unit_linked_margin –** *Unit–linked margin*, equal to the ratio between assets and technical provisions related to the index/unit–linked business. This value shall be filled only for the rows where the value of the lob_b column is equal to 31.
  The calculation of the numerator shall be consistent with the Assets held for index–linked and unit–linked contracts, from template S.02.01 (R0220) defined in Annex II of the ITS.
  The calculation of the denominator shall be consistent with the Technical provisions — index–linked and unit–linked, from template S.02.01 (R0690) defined in Annex II of the ITS.
  In order to fill the rows requiring the "net" of reinsurance values, the corresponding Reinsurance recoverables from: Life index–linked and unit–linked, consistent with the calculation from template S.02.01 (R0340) defined in Annex II of the ITS, shall be deducted from the denominator of the "gross" ratio.

- **Avg_guaranteed_rate –** *Average guaranteed yearly interest rate* "to the policyholder over the remaining lifetime of the contract expressed as a percentage.
  Where no guaranteed interest rate is implicitly or explicitly provided in the contract, the cell should be left blank, where a guaranteed interest rate is implicitly or explicitly provided, this should be reported accordingly (e.g., 0.01 if the rate is 1%, 0 if the rate is 0% etc.").
  Applicable where an average guaranteed interest rate is explicitly provided in the contract or where an alternative financial guarantee is implicitly provided, e.g., in form of a guaranteed sum insured, a guaranteed return of premiums or a guaranteed annuity benefit. Where no yearly interest rate guarantee is prescribed explicitly in the contract, the implied (yearly) guaranteed rate from the valuation date to the expected end of the guarantee should be reported.", consistent with the calculation from template S.14.01 (C0260) defined in Annex II of the ITS. This value shall be filled only for the rows where the value of the lob_b column is equal to 30.
- **EPIFP** – "*Expected profits included in future premiums* gross of reinsurance and taxes", consistent with the calculations from template S.12.01.01 (R0370) defined in Annex II of the ITS.
- **WP** – see B0 – General characteristics of the portfolio
- **Duration** – see B0 – General characteristics of the portfolio
- **SCR_overall** – *Solvency Capital Requirement* (SCR), as defined in Article 101 of the Solvency II Directive, for the lapse risk, covering all lapse (sub)risks that are calculated separately by the undertaking. SCR_overall takes into account the diversification within (sub-)risks SCR_1,…,SCR_8. In the unlikely case that the undertaking's internal model cannot produce as output the aggregated overall lapse risk SCR, an estimate can be included and reported in template G1. In this case the suggested methodology is to provide an estimate based on the Undertaking's own aggregation method, assuming all the non-lapse SCRs to be equal to zero.
- **SCR_1, …, SCR_8** – Various lapse risk *Solvency Capital Requirements* that the undertaking models separately. Each of these values (for instance SCR_1) is calculated without considering the diversification effect between itself (SCR_1) and the other (sub-)risks (SCR_2, … SCR_8). The number of filled columns shall be consistent with the answer provided by the undertaking in the qualitative lapse risk survey. For instance, if the undertaking has answered in the qualitative survey that the internal model produces two SCRs output, one for lapse level risk and one for lapse volatility risk, the undertaking shall provide numerical values for the columns SCR_1 and SCR_2, while leaving all cells in columns SCR_3, …, SCR_8 blank.

4.7.2 L1 – More granular characteristics

Table L1 broadens the scope of the data collected in the previous table by further refining the information and introducing an additional level of granularity, namely age, sex and policy age.

Segmentation variables:

- **lob_b** – see B0 – General characteristics of the portfolio
- **country_c** – see B0 – General characteristics of the portfolio. Only the top 3 countries (in terms of overall technical provisions) shall be considered.
- **gross_net_basis_z** – see B0 – General characteristics of the portfolio
- **age_bucket_lapse_x** – given segmentation of the portfolio at year-end 2023 based on the policyholder age. Possible values are "0–39", "40–69", "70+", "all".
- **premium_type_s** – type of premium. Possible values are "single", "other", "all". The segmentation shall be consistent[13] with the QRT s.14.01 C0140 ("Type of premium") according to the 2.7.0 Taxonomy.
- **sum_insured_bucket_k** – given segmentation of the portfolio based on the policy sum insured. The sum insured shall be consistent with the calculation from template S.26.14.01[14] (C0060) defined in Annex II of the ITS. Possible values (in EUR as at year end 2023) are "[0,100k)", "[100k,500k)", "500k+", "all".
- **policy_age_bucket_a** – given segmentation of the portfolio based on the years the policy has been in force. Possible values are "all", "0", "1", "2", "3", "4", "[5,7)", "[8,10)", "[10,15)", "15+". The integers shall be interpreted as intervals [k, k+1); for instance, the value "0" segments the portfolio selecting the policies with policy age between 0 and 1 (excluded).
- **distribution_channel_d** – given segmentation of the portfolio based on the distribution channel. The possible values are:
    - "direct": directly by the insurance undertaking,
    - "credit institutions": credit institutions acting as insurance distributors,
    - "other distributors": insurance distributors other than credit institutions,
    - "all".

  The definition of the three possible values is consistent with the definition of QRT S.14.01.01.05[15] C0061, C0062, C0063 respectively.

[13] The QRT s.14.01 has more than one sub-types of values to indicate a single premium or a non-single premium: these shall be considered as "single" or "other" respectively, for the purpose of this template.

[14] This template is introduced with the Taxonomy 2.8.0.

[15] This template is introduced with the Taxonomy 2.8.0.

- **product_classification_j** – *Product classification*, consistent with the definition in template S.14.01 (C0101 in the new taxonomy) defined in Annex II of the ITS; any different values should be classified as "other". Possible values are "single life", "other", "all".

Quantitative variables:

- **TP_without_RM**
- **Surrender_value**
- **Surrender_strain**
- **Unit_linked_margin**
- **Avg_guaranteed_rate**
- **EPIFP**
- **WP**
- **Duration**
- **SCR_overall**
- **SCR_1, …, SCR_8**

For the explanation of the quantitative variables, please see B0 – General characteristics of the portfolio and L0 – General characteristics of the portfolio.

4.7.3 L2 – Historical information on surrenders

In this table, undertakings are required to provide historical data on simple quantitative aspects on lapse, such as the observed and expected and surrenders. The aim is to obtain information on the undertaking risk profile and the variability of lapse risk.

Segmentation variables:

- **lob_b** – see B0 – General characteristics of the portfolio.
- **country_c** – see B0 – General characteristics of the portfolio. Only the top 3 countries (in terms of overall technical provisions) shall be considered.
- **age_bucket_lapse_x** – see L1 – More granular characteristics
- **premium_type_s** – see L1 – More granular characteristics
- **sum_insured_bucket_k** – see L1 – More granular characteristics
- **policy_age_bucket_a** – see L1 – More granular characteristics
- **distribution_channel_d** – see L1 – More granular characteristics
- **product_classification_j** – see L1 – More granular characteristics
- **year_t** – see B2 – Historical information on mortality claims

Quantitative variables:

- **observed_number_surrenders** – number of surrender claims incurred in year t. Please consider the definition of surrenders from article 1(13) of the Delegated Acts, "'surrender' means all possible ways to fully or partly terminate a policy, including the following: (i) voluntary termination of the policy with or without the payment of a surrender value; (ii) change of insurance or reinsurance undertaking by the policy holder; (iii) termination of the policy resulting from the policy holder's refusal to pay the premium;"
- **best_estimate_assumption_surrenders** – best estimate as at year-end t-1 of the surrender rate for the 1st year of projection (i.e. in year t). The methodology used to derive the assumptions or any proxy (for instance based on number of contracts or amount) shall be reported in table G1.
- **headcounts_at_start** – number of contracts in force at the beginning of year t
- **headcounts_at_end** – number of contracts in force at the end of year t
- **surrender_paid_gross** – total sum paid by the insurer due to the event of surrender, gross of risk mitigation techniques, in year t
- **surrender_paid_net** – total sum paid by the insurer due to the event of surrender, net of risk mitigation techniques, in year t

4.7.4 L3 – Lapse risk KRI internal model projection

In this table undertakings are asked to provide their internal model projections for a key risk driver of lapse risk, namely the lapse probability.

Segmentation variables:

- **lob_b** – see B0 – General characteristics of the portfolio.
- **country_c** – see B0 – General characteristics of the portfolio. Only the top 3 countries (in terms of overall technical provisions) shall be provided.
- **age_bucket_lapse_x** – see L1 – More granular characteristics
- **premium_type_s** – see L1 – More granular characteristics
- **sum_insured_bucket_k** – see L1 – More granular characteristics
- **policy_age_bucket_a –** see L1 – More granular characteristics
- **distribution_channel_d** – see L1 – More granular characteristics
- **product_classification_j** – see L1 – More granular characteristics
- **percentile_p** – see B3.1 – Biometric KRI internal model projection[16]
- **projection_year_T** – projection year. Possible values are 1, 5, 10.

Quantitative variables:

λ_b,c,x,s,k,a,d,j,p,T – average probability of a policy, with policy age_bucket_a as at year end 2023, type of premium s, country c, distribution_channel d, product_classification j,

[16] For ease of reporting, the percentile variable in table L3 follows the "wide" format.

LOB b, sum insured k to lapse within a year according to the percentile p of internal model projection after T years. In the table there is a column for every percentile. The probabilities should exclude any stochastic impact related to the dynamic policyholder behaviour. For clarity, **λ_x,a,T** is the 1 year probability of lapse calculated after T years of projections, for an individual of age **x** and policy age **a** at the start of the projection (the usual actuarial notation is ${}_{T|}\lambda_{x,a}$ where the | symbol indicated a time deferral) , therefore being aged X+T and with policy age a+T in year T.

The quantitative variables shall be provided according to the following table:

Data	**KRI**	**Format**	**Applicable projection years**	**Applicable percentiles**
A - best estimate	λ _b,c,x,s,k,a,d,j,p,T_BE	Probability, expressed in unit	All	best_estimate
B - estimated change compared to the BE for level risk only	λ _b,c,x,s,k,a,d,j,p,T_level	Shock, expressed in unit	All	All numeric
C - estimated mass lapse shock	λ _b,c,x,s,k,a,d,j,p,T_mass	Shock, expressed in unit	1	99.5

For “estimated changes compared to the BE for lapse level risk” it is meant the formula: X/BE-1 where X is the shocked value of the risk driver. For instance, the estimated changes compared to the BE under the Standard Formula are 0.50 (99.5th percentile) and -0.50 (0.5th percentile).

For “estimated mass lapse shock” it is meant the proportion of policies, among those identified by the segmentation variables, that are assumed to be discontinued during the first year of projection, under the 99.5th most extreme scenario. In this regard please report in the template G1 any modelling information that is deemed relevant.

For level risk it is meant the risk of misestimation of the current level of lapse for a given population

If undertakings do not differentiate the mass lapse shock (like the Standard Formula) they should provide the same value of shock for each combination of the segmentation variables.

If at any projection year the undertakings apply different shocks with a greater level of granularity compared to the segmentation variables, the weighted average shock shall be provided, using the sum insured[17] as weight.

4.8 EXPENSE RISK

4.8.1 E0 – General characteristics of the portfolio

In this table the undertaking shall provide information regarding the general characteristics of the portfolio that is covered by the internal model(s) related to expense risk(s).

Segmentation variables:

- **lob_b** – see B0 – General characteristics of the portfolio
- **country_c** – see B0 – General characteristics of the portfolio.
- **gross_net_basis_z** – see B0 – General characteristics of the portfolio
- **business_cohort_w** – see B0 – General characteristics of the portfolio

Quantitative variables:

- **TP_without_RM** – see B0 – General characteristics of the portfolio
- **Risk_Margin** – see B0 – General characteristics of the portfolio
- **WP** – see B0 – General characteristics of the portfolio
- **Duration** – see B0 – General characteristics of the portfolio
- **SCR_overall** – *Solvency Capital Requirement* (SCR), as defined in Article 101 of the Solvency II Directive, for the expense risk, covering all expense (sub)risks that are calculated separately by the undertaking. SCR_overall takes into account the diversification within (sub-)risks SCR_1, …, SCR_4. In the unlikely case that the undertaking's internal model cannot produce as output the aggregated overall expense risk SCR, an estimate can be included and reported in template G1. In this case the suggested methodology is to provide an estimate based on the Undertaking's own aggregation method, assuming all the non-expense SCRs to be equal to zero.
- **SCR_1, …, SCR_4** – Various expense risk *Solvency Capital Requirement* that the undertaking model separately. Each of these values (for instance SCR_1) is calculated without considering the diversification effect between itself (SCR_1) and the other (sub-)risks (SCR_2, … SCR_4). The number of filled columns shall be consistent with the answer provided by the undertaking in the qualitative expense risk survey. For instance, if the

[17] Or any other weight driver deemed more relevant by the undertaking, to be reported in G1

undertaking has answered in the qualitative survey that the internal model produces two SCRs output, SCR_1 for level expense risk and SCR_2 for trend expense risk, the undertaking shall provide numerical values for the columns SCR_1 and SCR_2, while leaving all cells in columns SCR_3, SCR_4 blank.

4.8.2 E1 – More granular characteristics

Table E1 broadens the scope of the data collected in the previous table by further refining the information and introducing an additional level of granularity, namely expenses type, consistently with QRT S.05.01.01.02.

Segmentation variables:

- **lob_b** – see B0 – General characteristics of the portfolio
- **country_c** – see B0 – General characteristics of the portfolio. Only the top 3 countries (in terms of overall technical provisions) shall be considered.
- **gross_net_basis_z** – see B0 – General characteristics of the portfolio
- **product_classification_j** – see L1 – More granular characteristics
- **expenses_type_k** – segmentation of the expenses based on the expenses type. Possible values are "administrative expenses", "Investment management expenses", "claims management expenses", "acquisition expenses", "overhead expenses", "other expenses", "all".
  The choice of values is consistent with the categorization in template S.05.01 defined in Annex II of the ITS. Please consult this document for the definitions.
- **premium_type_s –** see L1 – More granular characteristics

Quantitative variables:

- **BE_expenses –** *Best estimate of expenses* for the LOB b, in the country c, for product classification j and related to expense type k, in monetary amount.
- **SCR_overall**
- **SCR_1, …, SCR_4**

For the explanation of the remaining quantitative variables, please see E0 – General characteristics of the portfolio.

4.8.3 E2 – Historical information on expenses

In this table, undertakings shall provide historical data on simple quantitative expenses aspects, such as the observed and expected expenses amount. The aim is to obtain information on the undertaking risk profile and the variability of expense risk.

Segmentation variables:

- **lob_b** – see B0 – General characteristics of the portfolio
- **country_c** – see B0 – General characteristics of the portfolio. Only the top 3 countries (in terms of overall technical provisions) shall be considered.
- **product_classification_j** – see L1 – More granular characteristics
- **expenses_type_k** – see E1 – More granular characteristics
- **premium_type_s –** see L1 – More granular characteristics
- **year_t** – see B2 – Historical information on mortality claims

Quantitative variables:

- **observed_expenses** – amount of expenses that was sustained in year t. The definition/categorization of expenses type shall be consistent with the QRT S.05.01.01.02
- **expected_expenses** – amount of expenses that was expected in the year t, according to the best estimate as at end of year t–1
- **headcounts_at_start** – number of contracts at the beginning of year t
- **headcounts_at_end** – number of contracts at the end of year t

4.8.4 E3 – Expense risk KRI internal model projection

In this table undertakings are asked to provide their internal model projections for two risk drivers of expense risk, namely the expense forecast and the annual inflation rate.

Segmentation variables:

- **lob_b** – see B0 – General characteristics of the portfolio
- **country_c** – see B0 – General characteristics of the portfolio. Only the top 3 countries (in terms of overall technical provisions) shall be considered.
- **product_classification_j** – see E1 – More granular characteristics
- **expenses_type_k** – see E1 – More granular characteristics
- **premium_type_s** – see L1 – More granular characteristics
- **percentile_p** – see B3.1 – Biometric KRI internal model projection[18]
- **projection_year_T** – projection year. Possible values are 1, 2, 3, 4, 5, 10, 15, 20, 25, 30, 50.

Quantitative variables:

- **E_b,c,j,k,s,p,T** – percentile p of the distribution of amount of expenses forecasted to occur in year T for what concerns the LOB b, country c, product classification j, expenses type k, type of premium s.

[18] For ease of reporting, the percentile variable in table E3 follows the "wide" format.

- **π_b,c,j,k,s,p,T** – percentile p of the distribution of the annual inflation rate in year T for expenses related to LOB b, country c, product classification j, expenses type k, type of premium s.

π_p,T is the percentile p of the distribution of the random variable "inflation rate between 1st of January of year T and 31st of December of year T".

The quantitative variables shall be provided according to the following table:

Data	**KRI**	**Format**	**Applicable projection years**	**Applicable percentiles**
A - best estimate	E_b,c,j,k,s,p,T_BE	Absolute monetary amount, expressed in unit	All	best_estimate
B - estimated change compared to the BE for expenses level risk only	E_b,c,j,k,s,p,T_level	Shock, expressed in unit	1, 5, 10	All numeric
C - Annual inflation rate	π_b,c,j,k,s,p,T	Rate, expressed in unit	All	All (including best_estimate)

For "estimated changes compared to the BE for expenses level risk" it is meant the formula: X/BE-1 where X is the shocked value of the risk driver. For instance, the estimated change compared to the BE under the Standard Formula is 0.10 (99.5th percentile).

The shocked and best estimate amounts should be undiscounted, i.e., referring to the expenses amount forecasted in year T and not to the present value of the expenses amount expected to occur in year T.

For annual inflation rate, it is meant the assumed "inflation rate between 1st of January of year T and 31st of December of year T".

For level risk it is meant the misestimation of the level of Best Estimate Assumptions for expenses

Undertakings that do not model at all any of the abovementioned sub-risks shall leave the cells, relative to the estimate change in the risk driver for those sub-risks, blank.

Undertakings that model together with other sub-risks any of the abovementioned sub-risks, shall provide an estimate of the change in the risk driver for the specified sub-risk only.

5. APPENDIX

5.1 PRODUCT SPECIFICATIONS FOR TABLE B4

the specifications for the products are provided in the table below. Please consider the premium payment at year start and claim/annuity payment at year end. Please consider products without profit sharing, where no options are available, no expenses are born by the undertaking and no discontinuances[19] are performed. Please compute the quantitative variables as at 0+ considering products with a single premium that was paid at the contract start, in 0. This means that the TP_without_RM and SCR_overall, SCR_1, SCR_2… should be computed right after the inception of the policy and the receiving of the initial single premium, hence considering that there are no future cash inflows and that the cash outflows are only driven by the biometric event (e.g. death or survival of the insured person, depending on product type specified below).

For each product type a meaningful subset of the EBMP was selected. Please compute the quantitative variables for the subset of EBMP defined in the third column of the table.

product_type	**Description**	**EBMPs (see B3 – Latest information on biometric KRIs and risk class segmentation for definitions)**

[19] Article 1.14 of Solvency II Delegated Acts: 'discontinuance' of an insurance policy means surrender, lapse without value, making a contract paid-up, automatic non-forfeiture provisions or exercising other discontinuity options or not exercising continuity options;

term	Corresponds to the term: a product in which in the event the insured person deceases during the policy term, the nominee receives the sum insured pay-out equal to 1 EUR.	• **sex_s:** male, female • **age_x:** 20, 40, 50, 65 • **term:** 1, 10, lifetime
pure_endowment	Corresponds to the **pure endowment**: a product in which the policyholder receives a payment of a capital equal to 1 EUR at the policy term if he/she survives the term period.	• **sex_s:** male, female • **age_x:** 20, 40, 50 • **term:** 10
immediate_annuity	Corresponds to the **immediate life annuity**: a product in which the policyholder receives a periodic payment while he/she is still alive. Please consider an annuity of 1 EUR per annum until the policyholder is alive, payments made at the beginning of each year.	• **sex_s:** male, female • **age_x:** 65 • **term:** lifetime
deferred_annuity	Corresponds to the **deferred life annuity:** a product in which the policyholder receives a periodic payment while he/she is still alive. In case the insured person dies before the deferral period, no cash-outflows is paid by the undertaking. Please consider an annuity of 1 EUR per annum until the policyholder is alive, payments made at the beginning of each year.	• **sex_s:** male, female • **age_x:** 20, 40, 50 • **term:** lifetime • **annuity payment starts at 65 years**

5.2 RFR SPECIFICATIONS

RFR_i	Description
rfr_1	Corresponds to the EIOPA December 2023 basic Euro RFR curve, available at this link.
rfr_2	Corresponds to the EIOPA December 2023 basic Euro RFR curve +100 bps at all tenors of the EIOPA curve, including after the LLP.
rfr_3	Corresponds to the EIOPA December 2023 basic Euro RFR curve –100 bps at all tenors of the EIOPA curve, including after the LLP.