Insurance Stress Test 2018 Technical specifications

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Abbreviations

0	Baseline scenario
AEP	Aggregate Exceedance Probability
ALM	Asset and Liability Management
BOS	Board of Supervisors
BE	Best Estimate
BS	Balance Sheet
CAT	Catastrophe
D&A	Deduction and Aggregation
EA	Euro Area
ECB	European Central Bank
EMEs	Emerging Economies
ESRB	European Systemic Risk Board
EU	European Union
HICP	Harmonized Index Consumer Price
IM	Internal Model
IU	Insurance Undertaking
LACDT	Loss Absorbing Capacity of Deferred Taxes
LACTP	Loss Absorbing Capacity of Technical Provisions
LLP	Last Liquid Point
LTG	Long-Term Guarantee
MA	Matching Adjustment
MCR	Minimum Capital Requirement
Nat-Cat	Natural-Catastrophe Scenario
NCAs	National Competent Authorities
OEP	Occurrence Exceedance Probability
OF	Own Funds
ORM	Operational Risk Management
ORSA	Own Risk and Solvency Assessment
PIM	Partial Internal Model
QRT	Quantitative Reporting Templates
REIT	Real Estate Investment Trust
RFR	Risk Free Rate
RMBS	Residential Mortgage-Backed Security
RP	Risk Premium
SCR	Solvency Capital Requirement
SF	Standard Formula
ST	Stress Test
TP	Technical Provisions
TS	Technical Specifications
UFR	Ultimate Forward Rate
USP	Undertaking Specific Parameters
VA	Volatility Adjustment
YCdown	Yield curve down scenario
YCup	Yield Curve up scenario

1. Background

1. This is the fourth Union-wide exercise run by EIOPA.[1] As with each of the previous exercises, the overall objective is assessing the resilience of the European insurance industry against adverse market developments. EIOPA tailors the goal, scope and scenarios of each exercise according to the foreseen evolutions in market conditions and their potential negative implications for insurers.

1.1. Legal framework

2. EIOPA's legal stress testing framework is constituted of the following main pillars:
   a. "EIOPA shall, in consultation with the ESRB, develop criteria for the identification and measurement of systemic risk and an adequate stress testing regime which includes an evaluation of the potential for systemic risk that may be posed by financial institutions to increase in situations of stress. This stress testing regime shall help to identify those financial institutions that may pose a systemic risk".[2]
   b. "Systemic risk should be defined as a risk of disruption in the financial system with the potential to have serious negative consequences for the internal market and the real economy. All types of financial intermediaries, markets and infrastructures may be potentially systemically important to some degree".[3]
   c. "EIOPA shall, in cooperation with the ESRB, initiate and coordinate Union-wide assessments of the resilience of financial institutions to adverse market developments".[4] To that end, "EIOPA shall develop the following, for application by the competent authorities:
      i. common methodologies for assessing the effect of economic scenarios on an institution's financial position.
      ii. common approaches to communication on the outcomes of these assessments of the resilience of financial institutions."

1.2. Market conditions

3. The latest figures point to an overall persistent low yield environment characterised by narrow bond spreads and high asset prices in a context of low market volatility. However, some signs of increased volatility are observed together with a high level of political and economic policy uncertainty which might trigger potential sudden spikes in risk premia.

4. For some long-term European government bond yields as well as for short-term forward rates, a slight upward movement followed by a rather flat pattern has been observed in the second half of 2017. Although changes towards a less vigorous monetary stimulus or a normalisation of monetary policy should be gradually priced and incorporated by the market, a shock could still trigger a reassessment of risk premia leading to a sudden spike in yields.

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[1] EIOPA ran Insurance Stress Test exercises in 2011, 2014 and 2016
[2] Art. 23 (1) EIOPA Regulation (EU) No. 1094/2010.
[3] Recital 14 EIOPA Regulation (EU) No. 1094/2010.
[4] Art. 21 (2) b and 32 (2) EIOPA Regulation (EU) No. 1094/2010.

5. As sovereign bond yields are a benchmark for other asset return, the magnitude and the direction of their movements are essential for other financial markets. An increase in yields would imply a decrease of asset prices affecting all interest rate sensitive investments.[5]

1.3. Objective

6. The main objective of the 2018 insurance stress test is to assess the vulnerability of the European insurance sector to specific adverse scenarios. Such scenarios could trigger systemic risk across financial sectors which, in turn, could threaten the stability in the European financial markets and impact the real economy.

7. The forward-looking nature of this assessment of vulnerabilities aims at raising awareness of potential threats to financial stability posed by the insurance sector at European level. The outcome of the stress test should allow identifying whether the insurance sector is able to cope with the challenges specified by the scenarios tested. Comparability across different participating groups is of utmost importance in order to achieve the objectives. Transparency in disclosing the results is key to ensure a level playing field and enhance market discipline among the stress test participating groups.

8. In line with previous EIOPA stress tests, the 2018 exercise does not represent a "pass or fail exercise" for the institutions involved. Hence, the outcome is not intended to impose capital requirements to theoretically ensure that all participating groups "pass" those hypothetical scenarios.

9. The 2018 exercise will be based on a sample of large insurance groups representative of the European sector. The stress scenarios encompass a sufficiently wide range of risks, including a combination of market and insurance specific risks, and thus provide insight into the potential vulnerabilities under a wide range of stressed variables. In addition to the three scenarios, a separate questionnaire on the exposure to cyber risk is included in the stress test exercise.

2. Overview

10. This section explains the different building blocks of the exercise, and the interrelations among them allowing a better understanding of the choices made in the design of each of the elements separately.

11. Scope, scenarios and disclosure are treated in detail in sections 3, 4 and 6 respectively.

2.1. Scope

12. Consistent with the objectives and the requirements that the 2018 insurance stress test implies, this exercise targets the largest European (re)insurance groups. The selection of the participating groups was primarily based on:
    a. size;
    b. EU wide market coverage (from a financial stability perspective);

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[5] Refer to EIOPA (2015) Financial Stability Report, December 2017. Available at: https://eiopa.europa.eu/Pages/Financial-stability-and-crisis-prevention/EIOPA-Financial-Stability-Report---December-2017-.aspx

c. business lines conducted (life and non-life business).

The local market coverage and the number of jurisdictions covered were taken into account in a second stage while retaining the total assets criteria to ensure a certain degree of homogeneity as regards to size.

13. The target sample encompasses 42 insurance groups, including the top 30 groups plus 12 additional groups supervised by different NCAs, with total EU-wide market coverage close to 78% based on total consolidated group assets in the Solvency II reporting. The 12 additional insurance groups have been selected in order to build a representative sample in jurisdictions where the NCA was not already group supervisor of any of the top 30 entities.

14. The final list of the participating groups is provided in Table 1.

2.2. Methodology

15. The 2018 insurance stress test is a bottom-up exercise which involves calculations performed by the insurance groups on the impact of three distinct scenarios on their group balance sheet, own funds and solvency capital requirement. Groups will furthermore be requested to explain the main drivers of the impact of the scenarios on their balance sheet and solvency position in the explanatory note which complements the stress test reporting templates.

16. The reference date is 31 December 2017. The base case is the pre-stress financial situation of a group at the reference date and should be fully aligned with the 2017 annual Solvency II group reporting (to be) submitted to the NCA. The pre- and post-stress valuations have to be done at the specified reference date according to Solvency II and the current technical specifications.

17. Shocks prescribed in the stressed scenarios shall be applied to the entire in force business at the reference date. The approach for the consolidation of the results for the group balance sheet post stress shall be consistent with the baseline situation (e.g. with regard to third country (re)insurance undertakings consolidation).

18. Participating groups shall apply the prescribed stresses to the solo entities aggregated via Deduction & Aggregation (D&A) according to the methodology used for the standard reporting with subsequent identification of the marginal impact on the Own Funds and on the SCR.

19. The value of the participations in non-insurance entities and related undertakings[6] (e.g. credit institutions or ancillary service undertakings) held by the groups shall be stressed according to the shocks prescribed to the stock prices.

20. In order to achieve a level playing field and to ensure that the results after stress reflect the instantaneous nature of the stresses, participating groups should not take into account measures, actions or risk mitigating strategies that rely on taking future actions after the reference date. This includes e.g.

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[6] For a list of the type of non-insurance institutions refer to the Commission Delegated Regulation (EU) 2015/35 Article 335 (1-e) and article 336 (1-f).

dynamic hedging, de-risking strategies and any future action taken in the context of a recovery plan.[7]

21. The scenarios are designed as an instantaneous shock. The entire group balance sheet including all its entities and Unit Linked / Index Linked assets and liabilities is subject to the prescribed shocks.

22. All interest rate sensitive assets and liabilities shall be revalued using the stressed interest rate term structures.[8] In case no stressed interest rate term structures are provided for a scenario or a particular currency, participating groups shall use the relevant term structures used for the base case at the reference date as published by EIOPA.

23. The look-through approach should be applied when calculating the impact of the scenarios (e.g. for Collective Investment Undertakings).

24. The post-stress figures shall be generated coherently with the model(s) applied by the participating groups for Solvency II valuation purposes. The use of (partial) internal models and undertaking specific parameters (USPs) should have been approved by the group supervisor at reference date.[9]

25. Given the operational and methodological challenges assumed by the recalculation of the group SCR, participating groups are allowed to use approximations and simplifications. However a trade-off between feasibility and reliability is needed in view of the objectives of the exercise. Therefore the level of simplifications applied should be proportionate to this trade-off and still allow for a fair reflection of the direction and magnitude of the impacts, i.e. not distorting inappropriately the interpretability and the comparability of the results.

26. Participating groups are required to take the following principles into account when making use of simplifications or approximations for the post-stress recalculation of the Solvency II group SCR and Risk Margin:

   a) *Relevance of the risk drivers*
   Given that the prescribed shocks of a scenario may not materially affect each and every risk factor, the recalculation of the group SCR could exclude certain risk factors (SCR submodules) that are assumed not to change materially following the shocks.

   b) *Relevance of the subsidiaries*
   Given that the prescribed shocks of a scenario may not materially affect all subsidiaries or given that the solo SCR contribution[10] of a subsidiary to the group SCR is not material, the recalculation of the group SCR could exclude certain subsidiaries for which the impact of the scenario is assumed to be not material due to their exposures or their contribution to the group SCR.

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[7] Reassessment of the "foreseeable dividends or other foreseeable distributions" under stressed scenario is included in the allowed actions.

[8] Term structures under YCup and YCdowm scenarios for the relevant currencies with and without Volatility Adjustment (VA) are provided in the Technical Information. VAs are recalculated according to the shocks provided in the stressed scenarios.

[9] In case of model changes occurred between the calculation of the baseline and the stressed scenarios, participating groups are requested to liaise with their Group Supervisors and EIOPA. Furthermore, only models used for the regular QRT submission are allowed.

[10] Defined as the solo SCR of a subsidiary divided by the pre-stress group SCR

c) *Risk margin*

Given the operational and methodological challenges assumed by the recalculation of the risk margin, participating groups could apply scaling approaches for the adjustment of the post-stress risk margins (e.g. according to the change in the related best estimates).

d) *Loss Absorbing Capacity of Deferred Taxes and of Technical Provisions*

Participating groups are expected to recalculate the values of their loss absorbing capacity of technical provision (LACTP) and deferred taxes (LACDT) under each scenario and such elements shall not be part of the simplifications. Participating groups are requested to estimate the LACDT under stressed scenarios according to the approach used in the baseline scenario and they should provide detailed information in the explanatory note on the methodology used and the key assumptions underlying this calculation.[11]

27. The use of simplifications for the post-stress group Solvency II balance sheet and capital positions shall be implemented after a discussion with the group supervisor. This should take place as early as possible after the start of the calculation phase so that the group supervisor can assess how the group will incorporate these simplifications in order to limit or avoid exchanges related to their use, after the final results have been submitted. During this discussion, the participating groups should demonstrate how they intend to respect the principles on the basis of the applied simplifications. For the calculation of the post-stress figures, two main approaches are envisaged: *i)* a full reassessment of the solos' positions followed by a consolidation at group level or *ii)* the use of a group consolidated-based approach. Combinations of those two approaches are also allowed for the purpose of this exercise. The selected approach to produce the scenario's figures shall be discussed with the group supervisor as well.

28. The full solo reassessment approach consists in applying all the shocks on each insurance undertaking followed by an exhaustive consolidation of all liabilities and assets at the group level. This approach can be mixed or complemented with any group consolidated-based approach. Any proxies deviating from the year-end procedure shall be discussed with the group supervisors as stated in paragraph 27 and should be mentioned in the explanatory note and justified.

29. A pure group consolidated-based approach to this exercise consists of the use of a group model granting the assessment of companies' balance sheet positions. In this concern balance sheet calculations involved should give a prudential picture of the group with, at least, the same reliability than any quarterly financial stability reporting. Therefore, this group consolidated-based approach should guarantee a calculation of the post stress group balance sheet with enough precision to fill in the 2018 stress test reporting templates. Holistic approximation via sensitivity analysis should not be allowed regarding the magnitude of the shocks. All simplifications should

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[11] Regarding the LACDT, participant shall take into account the key principles set forth by EIOPA in its second set of advice to the European Commission on the review of specific items in the Solvency II Delegated Regulation of 28 February 2018 (paragraph 1872 and following). Document available at: https://eiopa.europa.eu/Publications/Consultations/EIOPA-18-075-EIOPA_Second_set_of_Advice_on_SII_DR_Review.pdf

consist in, for example, grouping liabilities in tractable quantities instead of breaking them down at solo level. Therefore, participating groups are allowed to apply their own model points (or model units or segments) and are requested to describe them in the explanatory note.

30. At submission date, participating groups are expected to hand in the explanatory note [12] which should cover, among other topics, how the scenarios have been applied. This note should explicitly cover the different simplifications and approximations that have been applied and the estimated impact they have on the final results.

31. The long-term guarantee (LTG) and Transitional measures are part of the stress test framework, in alignment with Solvency II. Hence, groups are requested to apply any LTG and Transitional measures they used at reference date. When the application of a measure requires a prior approval by the NCA or group supervisor this measure can only be used insofar approval at reference date has been granted.

32. The impact of the LTG and Transitional measures on the post-stress technical provisions, basic own funds, eligible own funds and SCR has to be calculated.

33. The impact, in absolute terms, of the Transitional measure on the technical provisions shall be calculated in the pre-stress scenario as approved by the national competent authorities (NSAs) and then kept constant in the post-stress scenario.

34. Transitional measures on Equity shall be applied consistently with the baseline scenario.

35. Matching adjustments shall be revaluated under stressed scenarios and applied consistently with the baseline case.

36. Recalculated Volatility Adjustments are provided by EIOPA under the market based scenarios (Ref. Technical Information).

37. Participating groups calculating the SCR under the standard formula shall apply the prescribed level of the symmetric equity adjustment under stressed scenarios.

2.3. Scenarios

2.3.1. Yield curve up shock combined with lapse and provisions deficiency stress

38. This scenario is originated from a sharp and sudden rise in interest rates which is triggered by both an upward shift in risk free rates as well as a significant increase in inflationary pressures. It is assumed that the economic uncertainty stemming from this abrupt change in the level of yields is not limited to the fixed income market, but also affects other financial market segments.

39. As a consequence of the economic uncertainty and market volatility, a large share of policyholders will immediately surrender their life insurance

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[12] The template for the Explanatory Note is included in the Stress Test Package and shall be filled in and submitted to NSAs with the filled templates for data collection.

contracts. As a consequence, it is assumed that life insurers face a significant instantaneous increase in lapses.

40. Higher-than-expected euro area inflationary pressure combined with an increase in claims inflation leads to a shortfall in liability claims reserves in the general insurance (GI) segment.

2.3.2. Low yield shock combined with longevity stress

41. The scenario assumes a protracted period of extremely low interest rates. The technical implementation is based on an instantaneous change of the relevant risk-free interest rate term structure, including an adjustment of the ultimate forward rate (UFR).

42. Additionally, the development of new technologies in the healthcare industry is assumed to pave the way for a general revision of the mortality tables, since the average life expectancy is expected to increase significantly across the entire population. In this context, life insurers will have to adjust their best estimate mortality assumptions.

2.3.3. Natural-Catastrophe (Nat-Cat) scenario

43. This scenario assumes a set of catastrophic events across some of the different natural perils to which Europe is exposed. Aggregate insured losses across all the events are expected to be within the range that could be expected from natural perils across Europe in an extreme year. Multiple catastrophic events for windstorm, earthquake and floods perils are assumed to affect various Europeans regions. The footprints, tracks or epicenters of the events reflect regional exposure to the particular peril.

44. The different catastrophic events are assumed to occur in a narrow timeframe. In addition to a sudden and very strong surge of their claims costs, general insurers may also suffer from exhaustion of the reinstatement provisions of their reinsurance treaties.

2.4. Cyber Questionnaire

45. Cyber risk has been gaining momentum as a growing concern for institutions[13], individuals, and the market. Given the current context of digital transformation and its implications for the economy and and more specifically the insurance sector, cyber risk is currently considered as one of the main emerging risks as it climbed to the top positions in the list of global risks for business in less than five years. Additionally, large-scale cyberattacks rank sixth in the list of risks most likely to occur in the next 10 years.[14]

46. In line with EIOPA's mandate to safeguard financial stability, it is necessary to identify, at an early stage, trends, potential risks and vulnerabilities at micro- and macroprudential level, across borders and across sectors. For

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[13] IAIS, OECD and G7 conducted several surveys and produced several papers notably the Issue paper on cyber risk to the Insurance sector, the OECD report on Supporting an effective cyber insurance market and G7 fundamental principles.
[14] The Global Risks Report 2017, 12th Edition. World Economic Forum. Available at: http://www3.weforum.org/docs/GRR17_Report_web.pdf

this reason, EIOPA includes in the 2018 Stress Test exercise a specific section on cyber risk.

47. The aim of the questionnaire developed for this exercise is to gather information on the current situation, the existing approaches, and best practices to deal with cyber risk. The questionnaire should not be understood as giving any indication on preferences of EIOPA with respect to specific tools, methods or processes to deal with cyber risk.

2.5. Consultation process

48. Relevant stakeholders have been consulted during the preparation of the stress test package. Ahead of the launching of the exercise, EIOPA engaged in discussions on the main elements of the exercise such as: the potential approaches for calculation of the balance sheet figures as well as the capital position post stress, the indicators and stress test results to be publicly disclosed, the number and design of the stress scenarios, the timeline and the technical specifications.

2.6. Disclosure

49. The 2018 insurance stress test exercise assumes an individual disclosure of results after the consent of the participant. This individual disclosure will only cover the impact of the scenarios on the group balance sheet including the excess of assets over liabilities.

50. The disclosure of the Long Term Guarantees (LTG) measures and transitional measures should be in line with the regular Solvency II reporting obligations and will give an indication of the impact of those measures on the excess of assets over liabilities.

51. The stress test participating groups are asked to disclose themselves condensed versions of the standard Quantitative Reporting Templates (QRTs) together with a number of predefined indicators after applying the stress scenarios. Information considered for public disclosure at individual group level is clearly identified in the templates for data collection. This individual disclosure of the stress test results is expected to generate several positive side effects; In particular, publishing individual results:

    • is expected to improve market discipline, namely to increase the reliability of the analysis and conclusions and to ensure a better quality of the data and results.

    • will support the stress test participating groups in their follow-up to the stress test exercise and will enhance their abilities to compare their results with those of their peers ("know your competitor") and refine their own assessment of the results (including potential follow-up measures) directly to the public.

52. The group individual disclosures will be supplemented by centralised access to the indicators published by the participating groups individually on their website.[15] In this context, EIOPA will also display individual non-anonymous indicators (ref. Annex 1) represented in selected charts and tables. The EIOPA stress test report will furthermore analyse results on an aggregated

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[15] E.g. link to the page of the companies' website where the results will be disclosed.

level (including aggregated anonymised results on the capital position post-stress).

53. Explicit consent from the participating groups on individual disclosure will be requested during the first submission of the results and ex-post of running at the very end oflater once the data quality process is concluded the stress test exercise. In this context, the following two-step approach will be applied:

- At the end of the calculation phase, when submitting the templates, all participating groups are requested to:

    i. explicitly confirm their understanding of the disclosure arrangements;

    ii. give their preliminary consent to the public disclosure of non-aggregated stress test results.

- After the validation phase, EIOPA through the relevant NCAs, will engage with the participating groups to ensure mutual acceptance of the results and groups will be asked to explicitly confirm their intention to publish their results at the agreed date, using the pre-defined means and format. The acceptance of the publication of their own results by the participating groups will allow EIOPA to republish (simultaneously) on its website the agreed individual results.

54. The results of those participating groups which do not consent for the public disclosure of their results will be incorporated in the aggregated figures to the extent that they cannot be individually identified.

3. Scope

55. Consistently with the objectives, the 2018 insurance stress test targets the largest European (re)insurance groups acting in the life and the non-life segment.

3.1.Selection process and criteria

56. The selection of the participating groups was primarily based on size, EU-wide market coverage (from a financial stability perspective), business lines (life and non-life business) and involvement of a sufficient number of local jurisdictions. The local market coverage was taken into account in a second stage.

57. According to the mentioned criteria, EIOPA in coordination with the NCAs, selected the target sample encompassing the top 30 EEA (re)insurance groups plus 12 additional (re) insurance groups which results in an EEA-wide market coverage close to 78% based on total consolidated assets according to the Solvency II Financial Stability reporting. The 12 additional (re)insurance groups have been selected from the ranking positions 31 to 55 in order to build a representative sample in jurisdictions not represented directly in the "Top 30" sample, applying a cap of a maximum of 2 (re)insurance groups in those countries.

3.2.List of participating groups

58. The list encompasses the EEA (re) insurance groups selected according to the criteria mentioned in the previous section and is shown in Table 1.

Table 1- List of participating groups

Group	Country
Vienna Insurance Group AG	Austria
Ageas SA/NV	Belgium
KBC Group NV	Belgium
PFA Holding A/S	Denmark
Danica Pension	Denmark
Sampo plc	Finland
AXA	France
CNP Assurances	France
Crédit Agricole Assurances	France
BNP Paribas Cardif	France
Sogecap	France
Covéa	France
Groupe des Assurances du Crédit Mutuel	France
Groupama S.A.	France
Natixis Assurances	France
Allianz SE	Germany
Munich Re	Germany
HDI V.a.G.	Germany
R+V Versicherung	Germany
HUK-COBURG Versicherungsgruppe	Germany
Assicurazioni Generali S.p.A.	Italy
Intesa Sanpaolo Vita SpA	Italy
Poste Vita SpA	Italy
Unipol Gruppo Finanziario S.p.A.	Italy
Aegon N.V.	Netherlands
NN Group N.V.	Netherlands
Achmea BV	Netherlands
Storebrand ASA	Norway
Gjensidige Forsikring ASA	Norway
VidaCaixa, S.A.U de Seguros y Reaseguros	Spain
MAPFRE S.A.	Spain
Nordea Life Group	Sweden
Skandia	Sweden
Aviva plc	United Kingdom
Legal & General Group Plc	United Kingdom
Prudential plc	United Kingdom
Standard Life Aberdeen plc	United Kingdom
Scottish Widows/LBGI	United Kingdom
The Royal London Mutual Insurance Society Limited	United Kingdom
Phoenix Group Holdings	United Kingdom
ReAssure Limited	United Kingdom
RSA Insurance Group plc	United Kingdom

4. Scenarios

59. EIOPA includes two scenarios combining market and insurance specific risk reflecting the current EIOPA/ESRB assessment of prevailing systemic risks to the financial system. Both of these combined scenarios were developed in cooperation with ESRB.

60. The first scenario assumes an abrupt and sizeable repricing of risk premia in global financial markets leading to a tightening of financial conditions. As insurers are large investors in government and corporate bonds, equity and real estate, they are particularly vulnerable to the risk of an abrupt fall in global asset prices. As a consequence of this adverse capital market development, (life) insurance companies face a significant increase in lapses. Furthermore, higher than expected inflationary pressures induce a shortfall in liability claims reserves in the general insurance (GI) segment.

61. The second scenario aims at assessing the resilience of participating groups to a prolonged low interest rate environment. Such low level of risk-free interest rates increases the value of insurers' long-term liabilities while compressing the margins between guaranteed returns on life policies and matching long-term low risk investments. Furthermore, the scenario assumes a higher than expected increase of the average life expectancy across the entire population.

62. The third scenario assesses the resilience of the participating groups against a series of Nat-Cat events occurring in Europe. The covered perils are windstorm (4 events), floods (2 events) and earthquakes (2 events). Events are designed to hit different geographical areas in Europe. Events are supposed to materialise subsequently in a short period of time. The rationale for this extreme but plausible assumption is the aim of testing the resilience of the participating groups against those events and not allowing for management actions such as amendments in the reinsurance programs.

4.1. Yield Curve up scenario (YCup)

4.1.1. Narrative

63. The YCup scenario is assumed to be initiated by an abrupt reversal in global risk premia. The swap rate curves would shift upwards by 85 bps in the EU and by more than 100 bps in other major advanced economies (see Figure 1).

Figure 1- Shock to 10-year swap rates (bps)
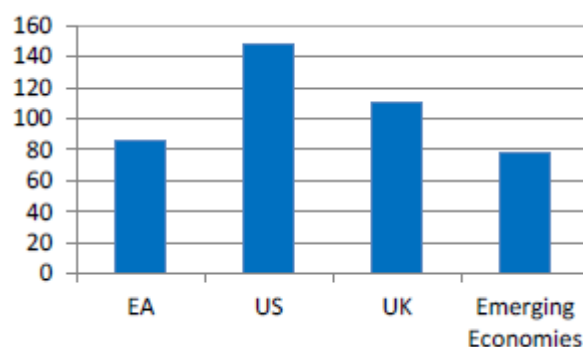
64. The overall repricing of risk premia would raise concerns about the debt sustainability of some EU sovereigns, widening the spreads of EU government bond yields against those on equivalent German bonds. On average, the spread of 10-year government bond yields against the German bond would widen by about 36 bps, reaching a maximum of 134 bps. Overall, 10-year government bond yields in the EU would increase on average by 155 bps with a range between 119 bps and 253 bps under the adverse scenario (see Figure 2).

Figure 2 - Distribution of the shocks to 10-year government bond yields in the EU (bps)
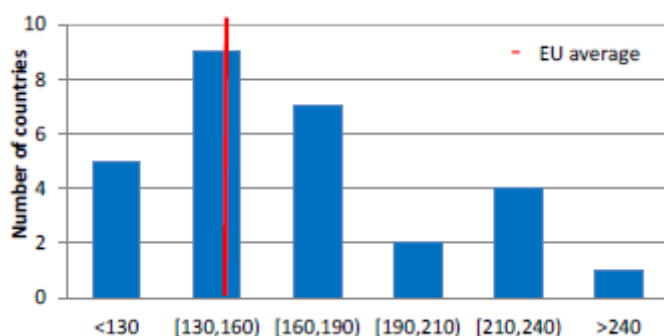
65. Yields on non-financial corporate and bank debt would increase too, following the generalised increase in risk premia (see Figure 3). In the banking sector, shocks to credit spreads would be aggravated by fundamental concerns about prospective mark-to-market losses on fixed-income assets implying an increase of more than 350 bps for lower-rated financial corporations. AAA-rated non-financial corporate bond yields would also increase by 138 bps in the EU, but the impact on credit spreads would be more pronounced for weaker issuers, reaching 310 bps for CCC-rated non-financial corporate bonds.

Figure 3 - Shocks to corporate bond yields (bps)
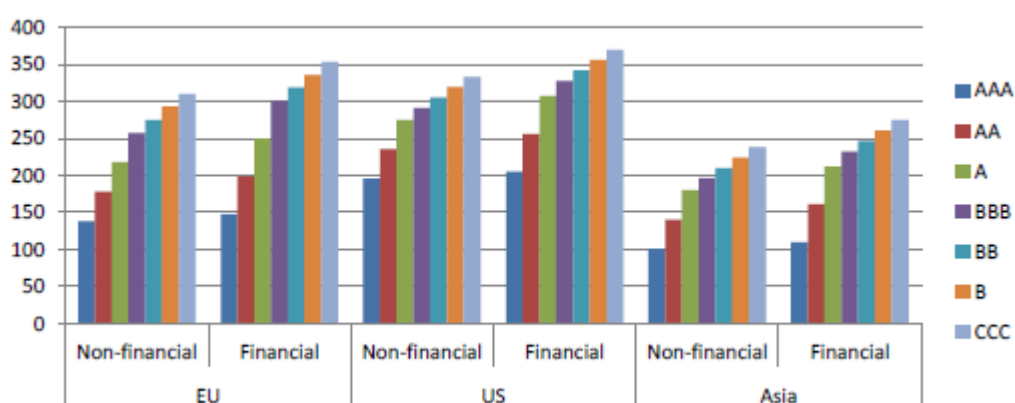
66. The repricing of risk premia would also imply a substantial drop of stock prices which would be amplified by shallow market illiquidity and a general sell-off by the non-banking sector. Overall, stock prices in the EU would decline by about 39% (see Figure 4). The value of investments in private equity and real estate investment trusts (REITs) would fall by between 33% and 41% (see Figure 5). Residential and commercial real estate prices would also decline significantly; by 20% and 31% respectively, with respect to the baseline at EU level (see Figure 6 and Figure 7).

Figure 4- Distribution of shocks to stock prices in the EU (%)
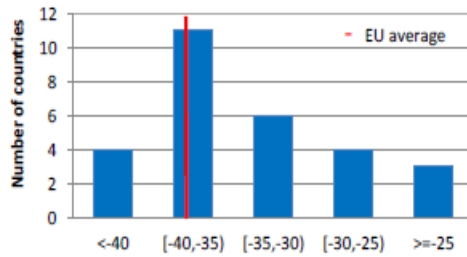
Figure 5- Shocks to private equities, Hedge funds and REIT (%)
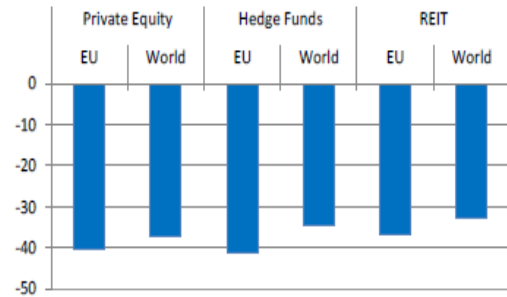
Figure 6- Distribution of shocks to residential property prices (%)
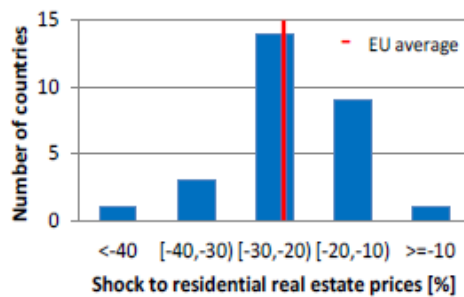
Figure 7- Distribution of shocks to commercial property prices (%)
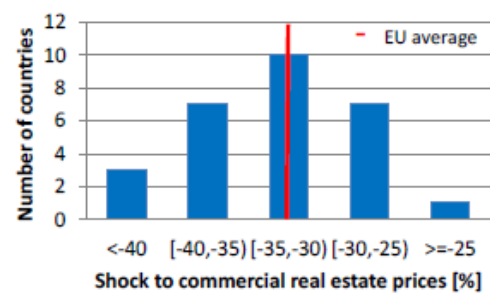
67. The repricing of risk premia is not only assumed to reduce the market value of insurers' investment portfolios but also to negatively affect the economic welfare of private households in general (e.g. in form of higher unemployment rates or lower income expectations). Against this background, life insurers are faced with an immediate general increase of lapses reflecting policy holders' concerns on the negative economic outlook resulting from the market crisis.

68. Higher-than-expected euro area inflationary pressures driven by the repricing of risk premia extend to a shortfall in liability claims reserves in the non-life segment due to considerably higher claims inflation than presumed for existing best estimate calculations. In line with those inflationary pressures, overall expenses and costs are expected to increase strongly.

4.1.2. Shocks and their application

4.1.2.1. Market Shocks

69. Market shocks are assumed to represent one-off, instantaneous and simultaneous shifts in asset prices relative to their end-2017 levels.

70. A detailed overview of the market stress parameters is contained in the file Technical information which accompanies these specifications. The market stress parameters refer to the following risk drivers:

- swap rates
- government bond yields

- corporate bond and residential mortgage-backed securities (RMBS) yields
- equity prices
- residential real estate prices
- commercial real estate prices
- other assets prices (private equity, hedge funds, real estate investment trusts (REITs), commodities)
- harmonised index consumer price (HICP) inflation rate

71. Shocks to swaps were utilised to derive the EIOPA risk-free rate curves (including UFR) via the Smith-Wilson model according to the following parameters:

   1) last liquid point (LLP) defined coherently with the LLP used for the definition of the EIOPA risk-free interest rate term structures (e.g. EUR=20Y; GBP=50Y; CHF=25Y);[16]
   2) the ultimate forward rate (UFR) is kept unchanged with respect to the baseline;
   3) Credit risk adjustment is kept unchanged with respect to the baseline.

   RFR term structures to be used under the YCup scenario are provided in the technical information.[17]

72. Shocks to government bonds refer to change in yields against the baseline. Therefore in order to derive changes in the spreads the shocks applied to the swap rates shall be taken into account as follow:

   a. The level after shock of the Euro swap curves are provided by the following equation: $SWAP_{Shock} = SWAP + Shock$, leading for example for the maturity 10y of the EUR currency to an increase of the swap rate by 85 bp.
   b. The yield level of a bond generally includes a credit spread on top of the swap curve (which may lead to positive or null risk correction). Therefore, the yield of a bond with a specific maturity can be expressed as $Y_{Bond} = SWAP + CreditSpread_{Bond}$ (where the swap term equals the maturity of the bond).
   c. The shock levels for sovereign or corporate yields prescribed in the Technical Information file refer to a change in the respective yields (and not to a change in credit spreads). The change in credit spreads can also be derived from the Technical Information file by $\Delta CreditSpread_{Bond} = \Delta Y_{Bond} - \Delta SWAP$
   d. In order to provide an illustrative example, a pre-stress level of the 10 year swap rate of 1.0% and a Belgian 10 year sovereign bond priced with a credit spread of 10 bps are assumed. The yield of this bond before shock therefore amounts to 1.1%.
   According to the prescribed stresses, the shock on the 10 year swap rate implies an increase of 85 bp (i.e. $SWAP_{Shock} = 1.85\%$) and a yield

increase for the sovereign bond of 167 bp (i.e. the yield after shock, it is 1.1%+1.67%=2.77%).

Using the formula specified in c), the credit spread for this bond under stressed scenario is 92 bps (= 277 bp – 185 bp), increased by 82 bps (92 bp-10 bp) with respect to the baseline.

73. Shocks to corporate bonds provided in the Technical Information are distinguished in financial / non-financial and grouped by rating (from AAA to CCC) and geographical areas (EU, US, ASIA). The corporate bond portfolio shall be allocated to the proper group and stressed according the prescribed shock. In the absence of a precise allocation, the following proxies can be applied:

   a. Bonds issued by corporations based in non-covered geographical areas shall be shocked according to the average shocks provided for larger geographical areas, i.e. EU, US, Asia.
   b. The shocks to CCC rating class shall also be applied to corporate bonds with lower ratings.
   c. Unrated bonds shall be shocked according to the shocks prescribed to the BBB-rated bonds.

74. The Technical Information file accompanying these specifications provides the shocks to equities for the different countries. Equities listed in countries whose shocks are not prescribed shall be shocked according to the average shocks provided for larger geographical areas, e.g. EU, EA, other advanced economies and emerging markets. In the case of equity of companies listed in more than one stock exchange, the average shock over all countries where the equity is listed shall be applied. Only the countries for which a shock has been specified as a part of the scenario description should be taken into account.

75. The technical information provides the shocks to commercial and residential real estates for the different countries. Real estates located in countries that are not listed shall be shocked according to the average shocks provided for large geographical areas, e.g. EU, EA, other advanced economies and emerging markets.

76. For the stress on the "loans and mortgage" portfolios, participating groups are expected to apply the same yield increases (in bps) as specified for the RMBS portfolios. In case the rating quality of the (different) portfolio(s) cannot be determined, a BBB rating quality has to be assumed.

77. Investments in infrastructure shall be shocked according to the underlying asset class using the provided shocks.

78. Second level or contagion effects are out of scope of the quantitative part of the 2018 Stress Test exercise, hence no impact on the creditworthiness of asset holdings and reinsurance recoverables (namely credit risk) have to be taken into account.

4.1.2.2. Insurance specific shocks

79. In the YCup scenario, insurance specific shocks encompass shocks to lapse and provision deficiency shocks. Technical details on the calibration are provided in the following paragraphs.

80. Insurance specific shocks shall be applied to the entire in-force business of the group.

81. The application of the lapse shock is subject to the following general side condition:

- If the application of the lapse stress as specified in the following subsections should imply a positive marginal impact on the Solvency II own funds of the participating groups (conditional to the situation after the application of the market shocks), then this positive marginal impact should be neutralised and capped to zero at group level.
- A separate line in the reporting template of the group own funds after stress requires participating groups to report the total amount of the caps applied at solo level (summed up across the group) outside the scope of the regular post-stress reporting items.

4.1.2.2.1. Lapse shock

82. In the following paragraphs, the technical term "lapse" refers to any kind of policyholder lapse options as specified in Art. 142 of the Delegated Regulation.[18] The lapse shocks should be applied to all of these types of policyholder options.

83. Immediately after the financial stresses, the scenario assumes a sudden increase of lapse rates reflecting the policyholders' reaction to the adverse market development. These lapses affect all non-mandatory insurances.

84. The instantaneous shock shall be applied to all product types uniformly at a level of 20%. Exceptions should be made for mandatory insurances.

85. In case a participating groups applies a dynamic lapse models, the prescribed immediate lapse shock shall overrule the dynamic adjustment of the lapses potentially generated by the set of prescribed market shocks, namely any dynamic adjustment shall be neutralised.

86. A detailed overview of the lapse stress parameters is contained in the file Technical Information.

4.1.2.2.2. Provision deficiency shocks

87. The YCup scenario encompasses a provision deficiency shock. Participating groups should calculate a shortfall for all liability claims reserves (e.g. world-wide for groups).

88. This uplift would be based on the assumption of 2.24% higher annual claims inflation than assumed for the existing best estimate of liabilities calculations.

89. For example, if non-life insurers assume that claims costs will increase by 3.0% per annum, due to the impact of inflation; they would then have to add a further 2.24% percentage points (i.e. a total of 2.24%+3.0%) for the post stress calculations.

90. The 2.24% higher annual claims inflation is composed of a 0.24% annual base inflation increase, as derived from the quarterly inflation shock in the YCup scenario, and an additional 2.0% increase of annual claims inflation on

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[18] Art. 142 (4) of the Delegated Regulation specifies the following types of "relevant options":
"(a)   all legal or contractual policyholder rights to fully or partly terminate, surrender, decrease, restrict or suspend insurance cover or permit the insurance policy to lapse;
(b)   all legal or contractual policyholder rights to fully or partially establish, renew, increase, extend or resume the insurance or reinsurance cover."

top of the base inflation following changes in the litigious claims environment.

4.2. Yield Curve down scenario (YCdown)

4.2.1. Narrative

91. The YCdown scenario assumes a protracted period of extremely low interest rates, with very low rates prevailing for longer maturities. The decline of interest rates would reflect a slowdown in economic activity which could be due to spillovers from emerging economies (EMEs). 10 year swap rates decline by about 80 bps in advanced economies and by about 40 bps in the EMEs (see Figure 8). In the EU, 10 year swap rates decline by 80 bps, while one year swap rates fall by 11 bps.

Figure 8- Shock to 10-year swap rates (bps)
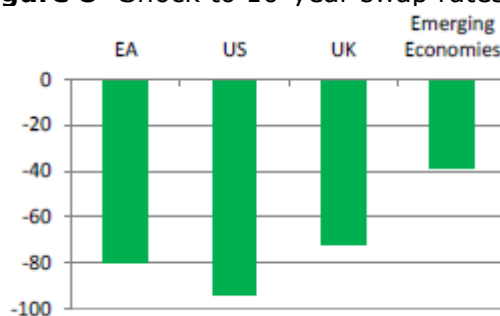
92. Ten year government bond yields would decline by about 36 bps at EU aggregate level with the declines at country level mainly reflecting the creditworthiness of the sovereign and spanning from -49 to 17 bps (see Figure 9). Corporate bond yields would also fall, and similar to the YCup scenario, the spread between AAA-rated corporate bonds and CCC-rated corporate bonds would increase (see Figure 10).

Figure 9- Distribution of the shocks to 10-year government bond yields in the EU (bps)
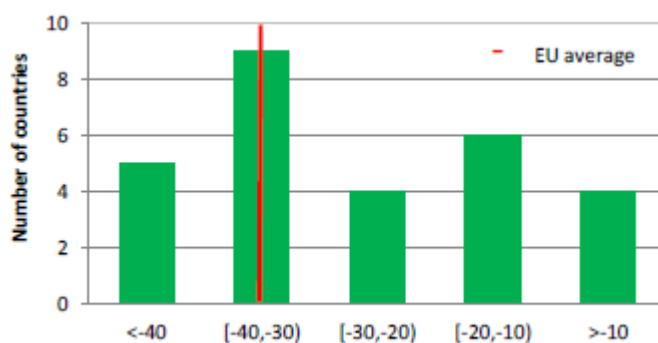
Figure 10 - Shocks to corporate bond yields (bps)
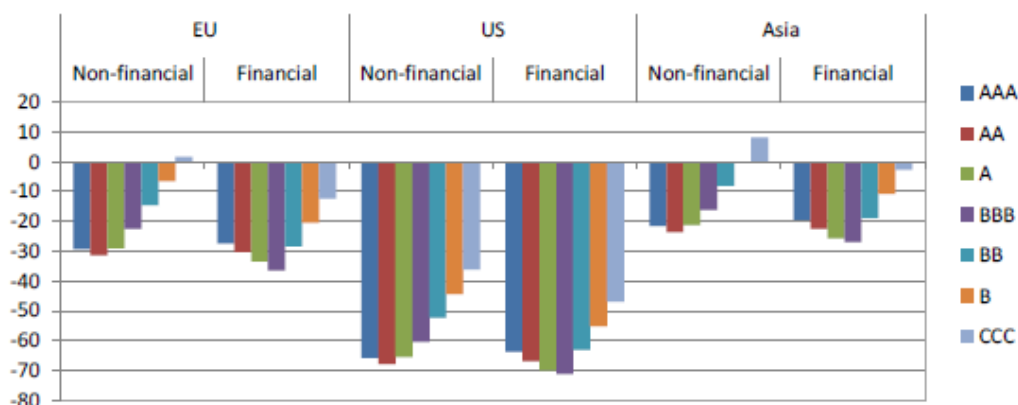
93. Due to lower economic growth, stock prices would also decline; however, the decline of stock prices would be much milder than in the YCup scenario. Stock prices would decrease by about 16% in the EU (see Figure 11). The value of investments in private equity and real estate investment trusts (REITs) would fall by between 6% and 18% (see Figure 12). Different factors would push real estate prices in opposite directions: the decline of the risk-free rate would lead to an increase in real estate prices, while the overall slowdown of the economy would exert downward pressure. For this reason, residential and commercial real estate prices are assumed to remain unchanged in this scenario.

Figure 11- Distribution of shocks to stock prices in the EU (%)
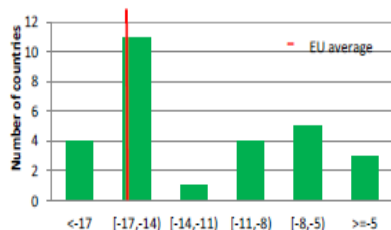
Figure 12- Shocks to private equities, Hedge funds and REIT (%)
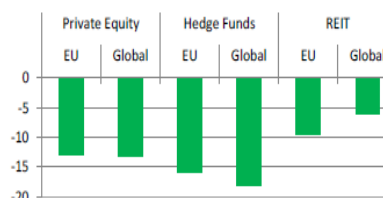
94. Furthermore, the development of new technologies in the healthcare industry is assumed to pave the way for a general revision of the mortality tables, since a significant increase in the average life expectancy is assumed across the entire population. In this context, life insurers have to adjust their best estimate mortality assumptions.

4.2.2. Shocks and their application

4.2.2.1. Market Shocks

95. Market shocks are assumed to represent one-off, instantaneous and simultaneous shifts in asset prices relative to their end-2017 levels. A detailed overview of the market stress parameters is contained in the Technical Information file accompanying these specifications. These market stress parameters refer to the following risk drivers:
   - swap rates

- government bond yields
- corporate bond and RMBS yields
- equity prices
- other assets prices (private equity, hedge funds, REITs, commodities)

96. Participating groups shall apply the prescribed shocks according to the following paragraphs.

97. Shocks to the swap rates are utilised to develop the term structure of the risk free rate curve (including UFR) via the Smith-Wilson model according to the following parameters:

 1) last liquid point (LLP) defined coherently with the LLP used for the definition of the EIOPA risk-free interest rate term structures (e.g. EUR=20Y; GBP=50Y; CHF=25Y);[19]
 2) the ultimate forward rate (UFR) for Euro is derived from the liquid part of the RFR curves by keeping the 1 year forward rate constant based on the information available within the two last market rates captured in the EIOPA risk free rate curve. The UFRs for the other currencies is derived by scaling the baseline UFRs with the relative change computed for Euro with respect to its baseline (i.e. 4.2%). As such, the low yield market characteristics of the stressed curve in the YCdown scenario are also translated into the extrapolated part of the risk free discounting curve;[20]
 3) Credit risk adjustment shall be kept unchanged with respect to the baseline.

RFR term structures to be used under YCdown scenario are provided in the Technical Information file accompanying these specifications.[21]

98. Shocks to government bonds refer to change in yields against the baseline. Therefore, in order to derive changes in the spreads, the shocks applied to the swap rates shall be taken into account as follow:

 a. The level after shock of the Euro swap curves are provided by the following equation: $SWAP_{Shock} = SWAP + Shock$, leading for example for the maturity 10y of the EUR currency to a reduction of the swap rate by 80 bp.
 b. The yield level of a bond generally includes a credit spread on top of the swap curve (which may also be zero or negative), therefore the yield of a bond with a specific maturity can be expressed as $Y_{Bond} = SWAP + CreditSpread_{Bond}$ (where the swap term equals the maturity of the bond).
 c. The shock levels for sovereign or corporate yields prescribed in the technical information file refer to a change in the respective yields (and not to a change in credit spreads). The change in credit spreads can also be derived from the technical information by $\Delta CreditSpread_{Bond} = \Delta Y_{Bond} - \Delta SWAP$

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[19] Technical documentation of the methodology to derive EIOPA's risk-free interest rate term structures. Available at: https://eiopa.europa.eu/Publications/Standards/Technical%20Documentation%20%2831%20Jan%20 2018%29.pdf

[20] Annex 2 provides motivations on the use of a modified UFR under YCdown scenario.

[21] Risk Free term structures with and without VA are provided for the most used currencies. For the currencies which are not included in the stressed tables, the baseline term structure shall be used under every scenario.

d. In order to provide an illustrative example, a pre-stress level of the 10 year swap rate of 1.0% and a Belgian 10 year sovereign bond priced with a credit spread of 10 bps are assumed. The yield of this bond before shock therefore amounts to 1.1%.

According to the prescribed stresses, the shock on the 10 year swap rate implies a reduction of 80 bp (i.e. $SWAP_{Shock} = 0.20\%$) and a yield decrease for the sovereign bond of 33 bp (i.e. the yield after shock is 1.1%-0.33%=0.77%).

Using the formula specified in c) the credit spread for this bond under stressed scenario is 57 bps (= 77 bp – 20 bp)), increased by 47 bp (57 bp -10 bp) with respect to the baseline.

99. Shocks to corporate bonds provided in the Technical Information are dissected in financial / non-financial and grouped by rating (from AAA to CCC) and geographical areas (EU, US, ASIA). The corporate bond portfolio shall be allocated to the proper group and stressed according to the prescribed shock. In absence of a precise allocation, the following proxies can be applied:

a. Bonds issued by corporations based in non-covered geographical areas shall be shocked according to the average shocks provided for larger geographical areas, i.e. EU, US and Asia.
b. Shocks to CCC corporate bonds shall be applied also to corporate bonds with lower ratings.
c. Unrated bonds shall be shocked according to the shocks prescribed to the BBB-rated bonds.

100. The Technical Information provides the shocks to equities for the different countries. Equities listed in countries that are not specifically listed shall be shocked according to the average shocks provided for the corresponding larger geographical areas, e.g. EU, EA, other advanced economies and emerging markets. In the case of companies whose stocks are listed in more than one stock exchange, the average shock over all countries where the equity is listed shall be applied.

101. For the stress on the 'loans and mortgage' portfolios, participating groups are expected to apply the same yield increases (in bps) as specified for the RMBS portfolios. In case the rating quality of the (different) portfolio(s) cannot be determined, a BBB quality has to be assumed.

102. Investments in infrastructure shall be shocked according to the relevant underlying asset class (i.e. using the provided shocks for corporate bonds, equities, etc.)

103. Second level or contagion effects are out of scope of the quantitative part of this exercise, hence no impacts on the creditworthiness of asset holdings and reinsurance recoverables (namely credit risk) are taken into account.

4.2.2.2. Insurance specific shocks

104. In the YCdown scenario, a longevity shock is prescribed. Technical details on the calibration are provided in the following paragraphs. The application of the insurance specific shock is subject to the following general side conditions:

- If the application of the longevity stress as specified in the following subsections should imply a positive marginal impact on the Solvency II own funds of the participating group (conditional to the situation after

the application of the market shocks), then this positive marginal impact should be neutralised and capped to zero at group level.

- A separate line in the reporting template of the group own funds after stress requires participating groups to report the total amount of the caps applied at solo level (summed up across the group) outside the scope of the regular post-stress reporting items.

4.2.2.2.1. Longevity Shock

105. The longevity shock shall be applied by participating groups as a relative change to the best estimate assumptions on mortality. The age-independent stress parameter of 15% shall be applied to all life insurance products.

106. The approach for calibrating the longevity shock parameter is consistent with the methodology recently suggested by EIOPA for the revision of the calibration of the Solvency II standard formula. The core elements of this approach can be summarised as follows:

- Empirical mortality data at total level (males and females together) were drawn from the Human Mortality Database (HMD) for several European countries (France, Germany, Netherlands, Italy, Poland, Spain, United Kingdom, Belgium, Denmark, Sweden and Greece) over the period 1985 – 2013/2014/2015/2016 (depending on the availability of the country-specific data in the HMD).[22]
- In order to incorporate to some extent the effects of model risk, two commonly used stochastic mortality models, namely the Lee Carter model and the Cairns-Blake-Dowd model, were included in the analysis.
- Both stochastic mortality models were estimated between the ages 40-90 for all countries using the "StMoMo"-Stochastic Mortality Modeling package from the R-software. Using the Kannisto-rule all mortality tables were "smoothly" extrapolated up to the age of 120 years old. After that age, mortality rates were set equal to the mortality rate for age 120 years.
- Based on the parameter estimates for each model and country, 5000 cohort mortality tables were simulated. Using these simulated tables, the simulated life expectancies for each age were calculated.
- For the actual calibration, the concept of an "age dependent shocked life expectancy" was defined by multiplying each future mortality rate with an age-dependent stress factor and then solving for these stress factors in such a way that for each age the stressed life-expectancy coincides with an appropriate percentile from the stochastic simulations.
- The age-dependent stress factors for each model were combined into a weighted average over all countries included in the analysis and finally the resulting weighted factors were averaged over both models.

107. A detailed overview of the longevity shock parameter is contained in the Technical Information.

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[22] For Germany data has only been taken from 1990 onwards as being the first year for combined (former) West/East Germany data

4.3. Natural Catastrophe (Nat-Cat) Scenario

108. The Nat-Cat scenario aims at assessing the vulnerability of the largest insurers to natural catastrophe risk across Europe, through a set of four European windstorms, a set of two central and eastern European floods and a series of two Italian earthquakes. In total, the aggregate insured loss from these events sum to EUR 48 billion for the insurance industry over the course of the year.[23]

4.3.1. Narrative

109. The Nat-Cat scenario assumes a set of catastrophic losses over Europe from various perils. There is a severe winter season with a cluster of four severe windstorms across northern Europe. The UK, France, Germany, the Benelux and Denmark suffer significant losses. In addition, heavy snowfall and the ensuing spring snowmelt generate severe swelling across the Danube and the Elbe, with two major flood events across Bulgaria and Romania, and Hungary and Austria. During the year, Italy and the south of France suffer a series of two earthquakes in rapid succession.

110. These events in aggregate cause approximately EUR 48 billion industry losses across Europe. Participating groups are to assume that the events are sufficiently separated in time (more than 504 hours apart, or 21 days) to be considered separate events for the purposes of reinsurance recoveries. Participating groups should not assume that they can implement management actions such as additional reinsurance purchases or changes to their underwriting in time to reduce their in-force gross or net exposures.

111. To facilitate participating groups' estimation of the losses from these events and minimise the burden while ensuring consistency across participating groups, consistent event identifications for the risk management solution (RMS) model are provided for each event. Participating groups may choose to use the RMS model or alternative events from other vendor models with similar physical characteristics and estimated industry losses, or their own in-house models or methodology to estimate their loss from each event.

4.3.1.1. European Windstorms

112. The first windstorm, with top wind speeds greater than 150 km/hr, causes industry losses of approximately EUR 7.5 billion across Europe. The strongest gusts are experienced in a band extending from southern U.K. across northernmost France, Belgium, southern Netherlands and central Germany (from North Rhine-Westphalia to Saxony). The event causes industry gross losses of around EUR 3.5 billion in the U.K.; EUR 2.5 billion in Germany; and around EUR500 million in each of France, Belgium and the

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[23] The RMS information on stochastic events in this document (the "Information") are provided by Risk Management Solutions, Inc. ("RMS"). The Information is provided under license to EIOPA and is RMS' proprietary and confidential information and may not be shared with any third party without the prior written consent of RMS. Furthermore, this Information may only be used for the specific business purpose specified by EIOPA and for no other purpose, and may not be used under any circumstances in the development or calibration of any product or service offering that competes with RMS. RMS specifically disclaims any and all responsibilities, obligations and liability with respect to any decisions or advice made or given as a result of the information or use thereof, including all warranties, whether express or implied. In no event shall RMS (or its parent, subsidiary, or other affiliated companies) be liable for direct, indirect, special, incidental, or consequential damages with respect to any decisions or advice made or given as a result of the contents of this information or use thereof.

Netherlands. The maps displayed in the Technical Information illustrate footprints for the closest matching RMS event (EventID: 3173976).

113. The second windstorm, with widespread winds of greater than 150 km/hr, causes industry losses of approximately EUR 5.5 billion across Europe. The strongest gusts are experienced in central and northern Germany, the Netherlands and Denmark. The event causes industry gross losses of around EUR 4 billion in Germany; and around EUR 500 million in each of the Netherlands and Denmark. The maps displayed in the Technical Information illustrate footprints for the closest matching RMS event (EventID: 3169635).

114. The third windstorm, with top wind speeds of greater than 170 km/hr, causes industry losses of approximately EUR 5.5 billion across Europe. The strongest gusts are experienced in a corridor extending across France (from Brittany to the border with Luxembourg/Germany) and into western Germany. The event causes industry gross losses of around EUR 4.5 billion in France, and around EUR 1 billion in Germany. The maps displayed in the Technical Information illustrate footprints for the closest matching RMS event (EventID: 3168192).

115. The fourth windstorm, with top wind speeds greater than 170 km/hr, causes industry losses of approximately EUR 4.5 billion across Europe. The strongest gusts are experienced across southern England and Wales in the U.K.; and northern parts of the Netherlands. The event causes industry gross losses of around EUR 3.5 billion in the U.K. and EUR 700 million in the Netherlands, with smaller loss contributions coming from surrounding countries (e.g.: northern France, Belgium, northern Germany and Denmark). The maps displayed in the Technical Information illustrate footprints for the closest matching RMS event (EventID: 3189947).

4.3.1.2. Central and eastern European Floods

116. The selected two long lasting, widespread, summer flood events materialize along major rivers in central and eastern Europe. The two events are selected to hit different regions within Austria, Czech Republic, Hungary, Poland and Slovakia. Each event last several weeks, with the following characteristics:
– Flood 1 – Mainly impacting Czech Republic (gross losses of around EUR 2.6 billion) and Poland (gross losses of around EUR 1.1 billion) with spill-overs on Austria, Hungary and Slovakia (gross losses for the three countries of around EUR 2.4 billion) (EventID: 4108900)
– Flood 2 – mainly impacting Poland (gross losses of around EUR 4.9 billion), Czech Republic (gross losses of around EUR 2 billion) and Slovakia (gross losses of around EUR 0.6 billion) with spill over in Hungary and Austria (gross losses for the 2 countries around EUR 158 million) (EventID: 4051952).
Maps and quantitative information on the two events are provided in the Technical Information.

4.3.1.3. Series of earthquakes

117. Italy Earthquake - A shallow earthquake of magnitude (Mw) 6.2 occurs on the Orzinuovi Fault in Northern Italy (this is a dipping fault around 45.47°N 9.96°E included in the Database of Potential Sources for Earthquakes larger than M 5.5 in Italy), generating industry losses of approximately EUR 7

billion. A map illustrating a spectral acceleration footprints for the closest matching RMS (EventID 1054274), which includes the effects of local site amplification is provided in the Technical Information.

118. Monaco Earthquake - A shallow earthquake of magnitude (Mw) 5.8 occurs at the southern end of the Monaco - Sospel - Saorge Fault in France (this is part of a fault system that composes of south-verging folds and thrusts covered by thick layers of sediments, and event epicenter near 43.76N 7.45 E) generating industry losses of approximately EUR 2 billion across France, Monaco and Italy. A map illustrating a spectral acceleration footprints for the closest matching RMS (EventID 1053920), which includes the effects of local site amplification is provided in the Technical Information.

4.3.2. Shocks and their application

119. Participating groups can assume that the losses are close to instantaneous with limited ability to reduce the gross or net loss by implementing changes to their underwriting strategy or reinsurance protections.

120. In estimating the impact of the Nat-Cat scenario, participating groups should provide their own view of the losses. Participating groups can draw on the external models they use where appropriate but should detail any adjustments they make to reflect the characteristics of their own portfolio or their own views. While event IDs for the main vendor models currently in use have been provided, data assumptions and adjustments made to the vendor model estimates to reflect participating groups' own view of risk should be disclosed in the Explanatory note, including for example:

   a) the allowance made for uncaptured exposures or data limitations (eg. locations not geocoded);
   b) the allowance made for non-modelled secondary perils (eg. storm-surge), non-modelled coverages (eg. contingent business interruption) and non-modelled lines of business (eg. marine), and
   c) any allowance made for post loss amplification.

121. Where participating groups have used their own methodology or alternative models, sufficient detail of the approach, methodology and assumptions made must be disclosed in the Explanatory note for EIOPA to form a view as to the appropriateness of the calculation.

122. Participating groups are also asked to provide their views as to the probability or return period of the specified scenario - Occurrence Exceedance Probability (OEP) and Aggregate Exceedance Probability (AEP), detailing the reasoning or approach behind these views. The probabilities or return periods should be in respect of observing losses of at least as large as the amount of gross loss to the firm from the scenario from all natural catastrophe losses over the course of one year.

123. Only reinsurance treaties settled at the end of 2017 (for the upcoming years) can be taken into account in the stress tests exercise. In other words, projects in changing the reinsurance program (with no implementation of the decision) cannot be taken into account in the stress tests. Agreed contractual limits shall be considered in the calculation of the losses generated by the series of events.

5. Cyber Questionnaire

124. The questionnaire shall be considered as a data collection rather than an assessment of the resilience of the participating groups under a stressed scenario.

125. The questionnaire is split in three parts:
    a. an initial section that considers the definition of cyber risk at group level (i.e. how cyber risk is defined). It aims to establish a level playing field among the insurers.
    b. a second part where the participating groups have to answer questions related to cyber-risk seen as an element of their own risk profile. This part aims to analyse the impact of identified cyber-attacks on the stress test (ST) participating groups over the last couple of years in terms of frequency and economic losses. In order to facilitate an appropriate level of comparability and consistency of the quantitative results, the concepts of a "cyber attack" and of an "economic loss due to a cyber attack" are further specified.
    c. The third part of the questionnaire encompasses questions related cyber risk as a part of the underwriting risk. This part aims at collecting information on the exposures held in the underwritten portfolios of insurance groups.

126. The questionnaire encompasses a set of multiple-choice and open questions. Detailed instructions and background information are provided in the specific template of the data collection file.

5.1. Part A: building a level playing field

127. Participating groups are requested to check their internal definition of cyber risk against a benchmark:

    "Cyber risk can be defined as any type of risk emanating from the use of electronic data and its transmission, including technology tools such as the internet and telecommunications networks. It also encompasses physical damage that can be caused by cybersecurity incidents, fraud committed by misuse of data, any liability arising from data storage, and the availability, integrity and confidentiality of electronic information – being related to individuals, companies, or governments." (IAIS (2016) Issues Paper on Cyber Risk to the Insurance Sector). [24]

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[24] Further definitions provided by other institutions:

BIS & OICV-IOSCO: "The combination of the probability of an event occurring within the realm of an organisation's information assets, computer and communication resources and the consequences of that event for an organisation." (https://www.bis.org/cpmi/publ/d146.pdf).

OECD: "digital security risks which, when they materialise, can disrupt the achievement of economic and social objectives by compromising the confidentiality, integrity and availability of information and information systems." (https://www.oecd.org/daf/fin/insurance/Supporting-an-effective-cyber-insurance-market.pdf)

PRA SS4/17 "For the purposes of this Supervisory Statement cyber insurance underwriting risk is defined as the set of prudential risks emanating from underwriting insurance contracts that are exposed to cyber-related losses resulting from malicious acts (eg cyber-attack, infection of an IT system with malicious code) and non-malicious acts (eg loss of data, accidental acts or omissions) involving both tangible and intangible assets."

(https://www.bankofengland.co.uk/-/media/boe/files/prudential-regulation/supervisory-statement/2017/ss417.pdf)

5.2. Part B: cyber risk as an element of your own risk profile

128. Insurers as all the other corporations are prone to cyber attacks. Usually companies include cyber risks in their operational risk management (ORM) approach. The questions contained in Part B aim at analysing the impact of identified cyber attacks on the participating groups over the last four years in terms of frequency and of economic losses. In order to facilitate an appropriate level of comparability and consistency of the quantitative results the concepts of a "cyber attack" and of an "economic loss due to a cyber attack" should be specified further.

129. The information provided shall be limited to events with a potential detrimental effect to the company (not to single individuals, namely the employees). Furthermore, the concept of a cyber attack is linked to a deliberate exploitation of computer systems, technology-dependent enterprises and networks that might lead to the following consequences (not exhaustive):

- Identity theft, fraud, extortion
- Malware, pharming, phishing, spamming, spoofing, spyware, Trojans and viruses
- Stolen hardware, such as laptops or mobile devices
- Denial-of-service and distributed denial-of-service attacks
- Breach of access
- Password sniffing
- System infiltration
- Website defacement
- Private and public Web browser exploits
- Instant messaging abuse
- Intellectual property (IP) theft or unauthorised access

130. Economic losses following cyber event should be limited to the "immediate" emerging costs such as:[25]

- Forensic investigation costs
- Legal costs
- Customer notification costs
- Potential business interruption costs
- Public relations expenses
- Fraud costs
- Extortion costs
- Physical damage costs
- IT/business remediation costs

131. The following examples of "slow-burn" costs shall not be reported:

- Third-party litigation expenses
- Customer churn from reputational damage
- Regulatory fines and penalties
- Share price impact
- Loss of management focus
- Loss of competitive advantage
- Loss of revenue

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[25] The classification of the cost in "immediate" and "slow burn" come from the report Lloyds (2017) Closing the gap – insuring your business against evolving cyber threats. Available at: https://www.lloyds.com/about-lloyds/what-lloyds-insures/cyber/cyber-risk-insight/closing-the-gap

5.3. Part C: cyber risk as a part of underwriting risk

132. This section aims at collecting information on the exposures held in the underwritten portfolios of insurance groups. It comprises "affirmative" and "non-affirmative" exposures.[26]

133. Participating groups are requested to provide standard figures (e.g. gross written premium, claims registered) distinguishing between affirmative and non-affirmative exposures over the last four years.

6. Reporting Templates and Disclosure

134. The set of templates to report the results under baseline and stressed scenarios are broadly based on the Solvency II QRT reporting. Guidance on the content of the templates can be retrieved from the Supervisory Reporting Annex II.

135. Participating groups shall fill in the reporting templates in the provided spreadsheet. The reporting templates are grouped in four main sections:
    a. Baseline scenario (Base)
    b. Yield curve up scenario (YCup)
    c. Yield curve down scenario (YCdown)
    d. Nat-Cat scenario (Nat-Cat)
    In addition, participating groups are requested to fill in the questionnaire on the cyber risk.

136. The collected information will be partly disclosed on an individual basis, upon the consent of the participating groups, and partly on an aggregated basis as described in section 6.3 - Individual and aggregated public information.

137. For the purpose of having a sound understanding of the stress test, results and the allowance for a proper data quality assurance process, participating groups are requested to submit additional information in line with the approach utilised to run the calculations (ref. to paragraph 27).

6.1. Reporting Templates

138. Reporting spreadsheet is structured as follow:

Table 2-Reporting templates

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[26] Affirmative exposure: insurance policies that explicitly include coverage for cyber risk. Non-affirmative: insurance policies that do not explicitly include or exclude coverage for cyber risk . This latter type of cyber risk is sometimes referred to as 'silent' cyber risk by insurance professionals.

Description	Baseline (0)	YCup (YCU)	YCdown (YCD)	NatCat (NC)
General information	Participant			
Model and Simplification applied in the calculation under stressed scenarios	Gen			
Indicators	Indicators			
Balance sheet reporting template as per QRT data for Groups	0.BS	YCU.BS	YCD.BS	NC.BS
Impact of long term guarantees measures and transitionals as per QRT data for Groups	0.LTG	YCU.LTG	YCD.LTG	NC.LTG
Own funds as per QRT data for Groups	0.OF	YCU.OF	YCD.OF	NC.OF
Calculation of Solvency Capital Requirement as per QRT data for Groups	0.SCR.SF	YCU.SCR.SF	YCD.SCR.SF	NC.SCR.SF
Solvency Capital Requirement - for groups using the standard formula and partial internal model as per QRT data for Groups	0.SCR.PIM	YCU.SCR.PIM	YCD.SCR.PIM	NC.SCR.PIM
Solvency Capital Requirement - for groups on Full Internal Models as per QRT data for Groups	0.SCR.FIM	YCU.SCR.FIM	YCD.SCR.FIM	NC.SCR.FIM
Asset characteristics	0.Assets	YCU.Assets	YCD.Assets	
Liabilities description	0.Liabilities.Char	YCU.Liabilities.Char	YCD.Liabilities.Char	
Duration of technical provisions	0.DTP	YCU.DTP	YCD.DTP	
Reporting of surrender values		YCU.RSV		
NatCat Details				NC.Details
Miscellaneous, qualitative questionnaire	Misc.Q			
Cyber risk questionnaire	CRQ			

139. Indicators

Participating groups are requested to report a set of indicators based on key figures computed under baseline and stressed scenarios. The aim of those indicators is to provide a comprehensive picture of the major drivers behind the impact of the prescribed scenarios on the balance sheet and on the capital position of the participating groups. Indicators are based on figures reported by participating groups in the reporting templates.

140. Balance sheet (0.BS; YCU.BS; YCD.BS; NC.BS)

The balance sheet fully replicates the QRT template for Groups (S.02.01.02.01). Solvency II figures shall be reported under each of the four scenarios. The template shall be used to report balance sheet data of all the participating groups irrespectively of the method applied for the calculation of group solvency, namely the "accounting consolidation-based method", the "deduction and aggregation method" or a "combination of both methods".

141. Impact of the long term guarantees measures and transitionals (0.LTG; YCU.LTG; YCD.LTG; NC.LTG)

The templates replicate the S.22.01.04 and require the application of the step-by-step approach on the impact of LTG and transitionals on technical provisions, basic and eligible own funds and SCR. The templates shall be filled according to the guidance provided by the log-file of the S.22.01.04. The version of the template to be filled under stressed scenarios does not include information on the tiering of the OF.

142. Own Funds (0.OF; YCU.OF; YCD.OF; NC.OF)

Information on the Own Funds is collected under each scenario via template S.23.01.04. 0.OF fully replicates the format of the standard QRT, while under stressed scenarios (YCU.OF; YCD.OF; NC.OF) only a subset of the information shall be provided.

143. Solvency Capital Requirement (0.SCR.xxx; YCU.SCR.xxx; YCD.SCR.xxx; NC.SCR.xxx)

The templates devoted to the collection of data on the Solvency Capital Requirement based on the standard QRT (S.25.01.04; S.25.02.04; S.25.03.04) are mutually exclusive. Undertakings shall fill in only the template in line with the approach they regularly utilise to report the capital position to the NCA, namely the SCR.SF in case of no authorization for full or partial internal model, or SCR.PIM and SCR.IM in case a partial internal model or a full internal model respectively was approved by the NCA. The 2018 exercise requires the re-calculation of the SCR under stressed scenarios.

144. Asset Characteristics (0.Assets; YCU.Assets; YCD.Assets)

Participating groups are requested to provide a breakdown of their asset allocation under the baseline and the two market scenarios. The reported assets shall refer only to the solo entities consolidated via Method 1 in order to grant consistency with the values of the asset classes reported in the balance sheet.[27] In particular, details on the decomposition of the exposures and of the modified durations for sovereign bonds, corporate bonds, collateralised securities, structured notes and loans and mortgages is requested. In addition, participating groups shall provide information on the decomposition of the equity portfolio according to the country of issuance. When completing the templates, participating groups shall exclude the asset held for unit and index linked portfolios. No look-through approach to report collective investments is requested. The credit quality of the assets, when requested, is defined according to iBoxx rating and Credit quality step.[28]

145. Liability Description (0.Liabilities.Char; YCU.Liabilities.Char; YCD.Liabilities.Char)

The template elaborates on the annual Solvency II technical provisions reporting for life and health (S.12.01.01) and for Non-Life (S.17.01.01). It requires only a subset of information with respect to the standard templates. Specifically, for the non-life a separation between two categories according to a long-duration and short-duration type of liabilities is requested.[29]

146. Duration of technical provisions (O.DTP; YCU.DTP; YCD.DTP)

The templates on duration of technical provisions should be filled consistently with QRT S.38.01.10 of the Financial Stability Reporting (i.e. the term "duration" refers to Macaulay duration).

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[27] Assets held by entities consolidated via D&A that are included in the balance sheet under the item "Holdings in related undertakings, including participations" shall not be reported.
[28] The approach to the credit quality applied by iBoxx is available at: http://content.markitcdn.com/corporate/Company/Files/DownloadDocument?CMSID=25329378592f4 31c9765becda11544f3
Conversion table between credit ratings and Credit Quality Steps is available at http://eur-lex.europa.eu/eli/reg_impl/2016/1800/oj
[29] Taking as a reference the QRT template S.17.01.01.01 the allocation of the business lines follows:
    i)   Type 1 liabilities: Medical expense insurance, Income protection insurance, Workers' compensation insurance, Motor vehicle liability insurance, General liability insurance, Legal expenses insurance.
    ii)   Type 2 liabilities: Other motor insurance, Marine, aviation and transport insurance, Fire and other damage to property insurance, Credit and suretyship insurance, Assistance, Miscellaneous financial loss, Non-proportional health reinsurance, Non-proportional casualty reinsurance, Non-proportional marine, aviation and transport reinsurance, Non-proportional property reinsurance.

147. Reporting of surrender values (YCU.RSV)

The template has to be filled in only in the YCup scenario and aims at collecting the effect of the temporary lapse shock on the liabilities.

148. Nat-Cat Details (NC.Details)

The template contains a set of quantitative and qualitative questions on the impacts of the events encompassed in the Nat-Cat scenario as well as the modelling assumptions applied to estimate the impacts thereof.

149. Miscellaneous qualitative questionnaire (Misc.Q)

The template encompasses four tables aimed at collecting qualitative information about the type of model used, calibration approaches, scenario generations and their application.

6.2. Templates for validation purposes

150. In order to ensure a proper data quality assurance process, a set of additional information is requested. Information shall be submitted according to the approach chosen for the calculation of the balance sheet figures under stressed scenarios. In case of full solos reassessment, participating groups shall utilise the templates reported in Table 3.

Table 3-Full solo reassessment

Description	Baseline (0)	YCup (YCU)	YCdown (YCD)	NatCat (NC)
Structure of the group	0.Scope			
Cash Flow	To be reported in Excel workbook EIOPA-BOS-18-210_Solo_CF_Templates			

151. Structure of the Group (0.Scope)

The template fully replicates the S.32.01.04 and has to be filled in under the baseline scenario with the addition of the information on the applied accounting standard. The information reported shall be used to assess the aggregation method applied to each solo entity.

152. Cash Flow (CF.Solo)

The template is designed to collect the projection of the expected undiscounted cash inflows and outflows per line of business and relevant currencies. The table shall be replicated for each relevant solo (and for each solo for each relevant currency) selected among the entities listed in the template 0.Scope according to the approach chosen for the Stress Test exercise (ref. paragraph 27). Instructions on how to populate the templates are provided in the Information Tab in the file.

153. In case of the use of a group consolidated-based approach (partial or full), participating groups shall use the templates reported in Table 4- Group consolidated-based .

Table 4- Group consolidated-based approach

Description	Baseline (0)	YCup (YCU)	YCdown (YCD)	NatCat (NC)
Model Point	To be reported in Excel workbook EIOPA-BOS-18-211_Model_Point_Templates			

154. Model Point (MP.CF)

The template aims at collecting the projection of the expected undiscounted cash inflows and outflows per defined model point and relevant currency.

Instructions on how to populate the templates are provided in the Information Tab in the file. Those cash flows should be reported according to the following minimum level of aggregation per relevant currency:

- Life
  - o Reinsurance life
  - o Direct insurance life
- Non-Life
  - o Reinsurance non-life
  - o Direct insurance non-life

155. Despite the different nature of their calculations, those cash flows will be analysed with similar validation checks to ensure the comparability of the results.

156. For clarification:
    a. In case a participating group applies the full solo reassessment, it is requested to provide cash-flows for all the solos included in the perimeter of the group via the excel workbook Solo_CF_Templates;
    b. In case a participating group fully applies the group consolidated-based approach, it is requested to provide cash-flows covering 100% of the group best estimates according to the excel workbook Model_Point_Templates;
    c. In case a participating group applies a combination of the solo reassessment and the group consolidated-based approach the cash-flows to be reported are expected to cover 100% of the group best estimates by submitting the excel workbook Model_Point_Templates complemented with the excel workbook for the solo cash flows (Solo_CF_Templates) of the entities that are covered by the solo reassessment approach.

6.3. Individual and aggregated public information

157. One of the objectives of the 2018 Insurance Stress Test exercise is to enhance the transparency of the insurance industry towards the market and policyholders. To that aim, the information collected under the baseline and the stressed scenarios will be partly individually disclosed, upon the consent of the participating groups, and partly reported at aggregated level.

158. In general, information regarding balance sheet items including the separate impact of the different LTG and transitional measures are individually publicly disclosed. Information on the capital position of the participating groups after stress, including balance sheet items that might allow inferring the capital position post stress of the participating groups will be displayed only at an aggregated level.

159. In detail, cells shaded in light blue are eligible for individual public disclosure while the light red cells will be used for aggregated disclosure. This color-coding applies consistently across the templates.

160. The individual public disclosure of the data will follow the process defined in section 2.5. Information that is requested to be individually disclosed is identified in the reporting templates via color code and is listed in Annex 1 – Information for public disclosure.

7. Timeline

161. The timeline for the 2018 insurance stress test is tailored to account for its essential features and it is as follows:

Figure 13 Timeline
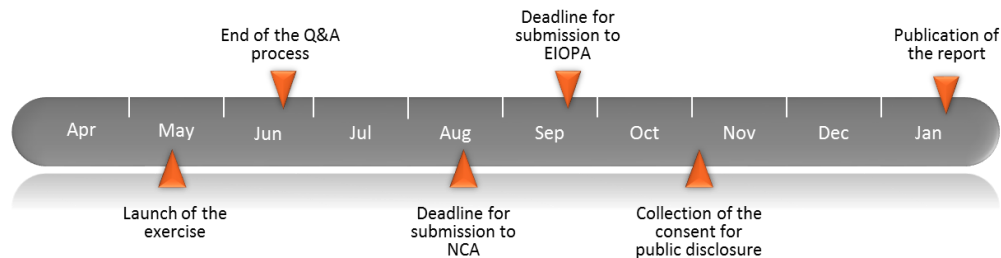
162. **Mid-May to mid-August - Calculation phase** by the selected groups of the results and indicators according to the prescribed scenarios. Participating groups are requested to submit filled in templates to NCAs by 16 August 2018.

163. **Mid-May to 3rd week of June - Q&A process:** the process will take place from mid-May to 3rd week of June 2017. This timeline is deemed appropriate and strikes the right balance between the need to have enough time to request potential clarifications and the need to have a stable stress test framework (e.g. technical specifications, templates and scenarios) as soon as possible in the process. Deadline for participating groups to send questions to the EIOPA Q&A workstream via the national supervisory authorities (NSAs): 14 June 2018.

164. **Mid-August to end October - Quality assurance** of the results: the envisaged process follows a two-step approach divided into i) local quality assurance step (from mid-August to mid-September 2018) and ii) central quality assurance step (from mid-September to end-October 2018). The two envisaged steps will have segregated roles in order to increase the quality of the overall process: at local level, the proximity between NCA and groups allows a thorough analysis of the consistency of the reporting; the central level process will focus on cross-sectional consistency. Potential resubmissions requested by NCAs or EIOPA in case the submitted information appears inconsistent or implausible (based on findings in the local or central validation) will take place between mid-August and end-October 2018. Therefore participating groups should stand ready to react to NCAs requests during this period.

165. **Last week of October – 1st week of November 2018 - Collection of consent for publication**: according to the two-step disclosure process described in section 2.5, EIOPA will liaise with groups in order to gather the consensus for the individual publication with regard to the reported data and calculated indicators.

166. **November to December – Drafting**: The two-month time window will be devoted to draft the stress test report and to the approval process. The aim is allowing the disclosure of the individual results by the participating groups and the publication of the insurance stress test report before the second half of January 2019.

Annex 1 – Information for public disclosure

Methodology

Extract of the Explanatory note providing insight into the approach chosen by the participating group to compute the post-stress positions (ref. par.27, 28 and 29).

Indicators

Area	Description	Indicator	Baseline	YCup	Ycdown	NatCat
Balance sheet position	Assets over Liabilities (AoL)	$\dfrac{Total\ Assets}{Total\ Liabilities}$				
	Assets over Liabilities without impact of LTG and transitional measures on the liabilities (AoLWO)	$\dfrac{Total\ Assets}{Total\ Liabilities}\ (WO)$				
	Relative change in Excess of assets over Liabilities (EoL)	$\dfrac{EoL\ after\ stress}{EoL\ baseline}-1$	▨			
	Relative change in Excess of assets over Liabilities without LTG and transitional measures (EoLWO)	$\dfrac{EoL\ after\ stress\ (WO)}{EoL\ baseline}-1$	▨			
Asset allocation	Relative change in investment in Equities (E)	$\dfrac{E_{after\ stress}}{E_{baseline}}-1$	▨			▨
	Relative change in investment in Government bonds (GB)	$\dfrac{GB_{after\ stress}}{GB_{baseline}}-1$	▨			▨
	Relative change in investment in Corporate bonds (CB)	$\dfrac{CB_{after\ stress}}{CB_{baseline}}-1$	▨			▨
	Relative change in property (other than for own use) (P)	$\dfrac{P_{after\ stress}}{P_{baseline}}-1$	▨			▨
	Relative change in assets hel for index and unit linked contracts (ILUL)	$\dfrac{ILUL_{after\ stress}}{ILUL_{baseline}}-1$	▨			▨
	Relative change in Loans and Mortgages (LM)	$\dfrac{LM_{after\ stress}}{LM_{baseline}}-1$	▨			▨
Technical provisions	Relative change in total technical provisions (TP)	$\dfrac{TP\ after\ stress}{TP\ baseline}-1$	▨			
	Relative change in technical provisions non-life (TP NL)	$\dfrac{TPNL\ after\ stress}{TPNL\ baseline}-1$	▨			
	Relative change in technical provisions life (TP L)	$\dfrac{TPL\ after\ stress}{TPL\ baseline}-1$	▨			
	Relative change in technical provisions unit linked (TP UL)	$\dfrac{TPUL\ after\ stress}{TPUL\ baseline}-1$	▨			

Balance Sheet

		Baseline	YCup	Ycdown	NatCat
Assets		//////	//////	//////	//////
Goodwill	R0010				
Deferred acquisition costs	R0020				
Intangible assets	R0030				
Deferred tax assets	R0040				
Pension benefit surplus	R0050				
Property, plant & equipment held for own use	R0060				
Investments (other than assets held for index-linked and unit-linked contracts)	R0070				
Property (other than for own use)	R0080				
Holdings in related undertakings, including participations	R0090				
Equities	R0100				
Equities - listed	R0110	//////	//////	//////	//////
Equities - unlisted	R0120	//////	//////	//////	//////
Bonds	R0130				
Government Bonds	R0140				
Corporate Bonds	R0150				
Structured notes	R0160				
Collateralised securities	R0170				
Collective Investments Undertakings	R0180				
Derivatives	R0190				
Deposits other than cash equivalents	R0200				
Other investments	R0210				
Assets held for index-linked and unit-linked contracts	R0220				
Loans and mortgages	R0230				
Loans on policies	R0240	//////	//////	//////	//////
Loans and mortgages to individuals	R0250	//////	//////	//////	//////
Other loans and mortgages	R0260	//////	//////	//////	//////
Reinsurance recoverables from:	R0270				
Non-life and health similar to non-life	R0280	//////	//////	//////	//////
Non-life excluding health	R0290	//////	//////	//////	//////
Health similar to non-life	R0300	//////	//////	//////	//////
Life and health similar to life, excluding health and index-linked and unit-linked	R0310	//////	//////	//////	//////
Health similar to life	R0320	//////	//////	//////	//////
Life excluding health and index-linked and unit-linked	R0330	//////	//////	//////	//////
Life index-linked and unit-linked	R0340	//////	//////	//////	//////
Deposits to cedants	R0350				
Insurance and intermediaries receivables	R0360				
Reinsurance receivables	R0370				
Receivables (trade, not insurance)	R0380				
Own shares (held directly)	R0390				
Amounts due in respect of own fund items or initial fund called up but not yet paid in	R0400				
Cash and cash equivalents	R0410				
Any other assets, not elsewhere shown	R0420				
Total assets	R0500				

		Baseline	YCup	Ycdown	NatCat
Liabilities		▨	▨	▨	▨
Technical provisions – non-life	R0510				
Technical provisions – non-life (excluding health)	R0520				
Technical provisions calculated as a whole	R0530	▨	▨	▨	▨
Best Estimate	R0540	▨	▨	▨	▨
Risk margin	R0550	▨	▨	▨	▨
Technical provisions - health (similar to non-life)	R0560				
Technical provisions calculated as a whole	R0570	▨	▨	▨	▨
Best Estimate	R0580	▨	▨	▨	▨
Risk margin	R0590	▨	▨	▨	▨
Technical provisions - life (excluding index-linked and unit-linked)	R0600				
Technical provisions - health (similar to life)	R0610				
Technical provisions calculated as a whole	R0620	▨	▨	▨	▨
Best Estimate	R0630	▨	▨	▨	▨
Risk margin	R0640	▨	▨	▨	▨
Technical provisions – life (excluding health and index-linked and unit-linked)	R0650				
Technical provisions calculated as a whole	R0660	▨	▨	▨	▨
Best Estimate	R0670	▨	▨	▨	▨
Risk margin	R0680	▨	▨	▨	▨
Technical provisions – index-linked and unit-linked	R0690				
Technical provisions calculated as a whole	R0700	▨	▨	▨	▨
Best Estimate	R0710	▨	▨	▨	▨
Risk margin	R0720	▨	▨	▨	▨
Other technical provisions	R0730				
Contingent liabilities	R0740				
Provisions other than technical provisions	R0750				
Pension benefit obligations	R0760				
Deposits from reinsurers	R0770				
Deferred tax liabilities	R0780				
Derivatives	R0790				
Debts owed to credit institutions	R0800				
Financial liabilities other than debts owed to credit institutions	R0810				
Insurance & intermediaries payables	R0820				
Reinsurance payables	R0830				
Payables (trade, not insurance)	R0840				
Subordinated liabilities	R0850				
Subordinated liabilities not in Basic Own Funds	R0860	▨	▨	▨	▨
Subordinated liabilities in Basic Own Funds	R0870	▨	▨	▨	▨
Any other liabilities, not elsewhere shown	R0880				
Total liabilities	R0900				
Excess of assets over liabilities	R1000				

Impact of the LTG and transitional measures (Step-by-step approach)

		Amount with Long Term Guarantee measures and transitionals	Impact of the LTG measures and transitionals (Step-by-step approach)								
			Without transitional on technical provisions	Impact of transitional on technical provisions	Without transitional on interest rate	Impact of transitional on interest rate	Without volatility adjustment and without other transitional measures	Impact of volatility adjustment set to zero	Without matching adjustment and without all the others	Impact of matching adjustment set to zero	Impact of all LTG measures and transitionals
		C0010	C0020	C0030	C0040	C0050	C0060	C0070	C0080	C0090	C0100
Baseline	Excess of assets over liabilities										
YCup	Excess of assets over liabilities										
Ycdown	Excess of assets over liabilities										
NatCat	Excess of assets over liabilities										

Annex 2 – UFR under YCdown scenario - rationale

Market scenario narrative:

The YCdown scenario assumes a slowdown of the economic activities triggered by an outside-EU event. Markets reflect the low growth environment through a global reduction in prices of equities and alternative investments and a general decline in yields of the corporate and sovereign bonds. In line with the market trends also swap rates decline pushed by conventional and unconventional expansionary monetary policy interventions enforced by the central banks to contrast the economic slowdown. This generates a protracted period of extremely low interest rates with very low rates prevailing for longer maturities.[30] The low level of the swap rates are a consequence of the prolonged economic slowdown produced by the 2007/2008 financial crisis.

Moreover, the EIOPA stress test exercise is based on a one-off fixed balance sheet approach; therefore the prescribed shocks shall be intended as instantaneous with permanent effects, in other words, the shock to the swap rates are there to stay.

EIOPA RFR methodology

The Risk Free Rate Methodology is based on the Smith-Wilson model that derives the RFR curves from the market prices of the sovereign debt instruments for the maturities that are deemed to be sufficiently liquid.[31] Therefore, the approach implies to derive the short and mid maturities of the term structure (up to the LLP) via interpolation of the liquid points and to derive via extrapolation the longer maturities beyond the last liquid point. The model requires the definition of a long term forward rate to be used as a convergence point, namely the Ultimate Forward Rate (UFR). The UFR is defined via the average of the long term averages of the past real rates.

RFR under stressed scenario

The YCdown scenario prescribes a reduction of the swap rates for the different currencies up to the respective last liquid points.[32] However, this has to be considered only as a mere model limitation and a full implementation of the narrative shall prescribe also stresses for longer maturities. Those stresses in line with the concept of "prevalence" in the longer maturities are supposed to be more severe or at least in line with the shorter maturities.[33]

Against this background, the Smith-Wilson model shall not be run on an unchanged UFR with respect to the baseline scenario. Indeed, any value derived by historical observations would not properly reflect the drafted narrative. Also, a construction of a UFR according to the current Risk Free Rate methodology, would not serve the purpose to define a full and consistent stressed curve as an unchanged UFR.[34] Irrespectively of the application of the +/- 15bp cap, it will

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[30] ESRB (2018) Adverse scenario for the European Insurance and Occupational Pensions Authority's EU-wide insurance stress test in 2018.

[31] For the EURO the Last Liquid Point is set at year 20. However, the UK GBP the LLP is set at year 50, see paragraphs 71 and 97.

[32] The ECB model is based on the conditional expected shortfall and needs a sufficiently large number of data points to produce meaningful results. This implies that shocks are limited to those securities and to those maturities that are sufficiently traded (i.e. the more liquid).

[33] See the shocks prescribed to USD and CHF from the maturities between 20 to 50 years.

[34] The internal consistency of the prescribed scenarios in alignment with the respective narrative was one of the guidance followed during the design phase of the 2018 exercise.

reflect an economic scenario aligned with the current expectations of the interest rates, therefore with a baseline situation and not with a stressed scenario implying a persistent low yield environment. The current EIOPA methodology derives the UFR to be applied for regulatory purposes. Nonetheless, long term rates, including UFR, that are closer to market observed rates would be more appropriate for assessing vulnerabilities to financial stability stemming from such a scenario. The fact that EIOPA stress test is a vulnerabilities assessment and not a capital exercise, allows for such departures from the strict implementation of the framework.

The purpose of the proposed approach is to prescribe stresses both in the liquid and extrapolated part of the curves in order to better reflect the concept of low rate in the longer maturities. To that aim, the liquid part of the curve is derived from the shocked liquid points and the non-liquid part is extrapolated according to a UFR calibrated on the levels of the longest available maturities of the liquid part of the shocked term structure. Specifically, in order to extend the effect of the shocks prescribed to the liquid maturities, the 1-year forward rate derived from the liquid part of the stressed curve is kept constant using the last forward rate that can be calculated based on market (stressed) observation as the UFR.