EIOPA-BOS-16-109
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Insurance Stress Test 2016
Technical specifications

Table of contents

List of Table and Figures

Abbreviations

0	Baseline scenario
ALM	Asset and Liability Management
BOS	Board of Supervisors
BE	Best Estimate
BS	Balance Sheet
EA	Euro Area
ECB	European Central Bank
ESRB	European Systemic Risk Board
EU	European Union
DH	Double-Hit scenario
IM	Internal Model
IU	Insurance Undertaking
LLP	Last Liquid Point
LTG	Long-Term Guarantee
LY	Low for Long scenario
MCR	Minimum Capital Requirement
NCA	National Competent Authority
OF	Own Funds
ORSA	Own Risk and Solvency Assessment
PIM	Partial Internal Model
QRT	Quantitative Reporting Templates
REIT	Real Estate Investment Trust
RFR	Risk Free Rate
RP	Risk Premium
SCR	Solvency Capital Requirement
SF	Standard Formula
ST	Stress Test
TS	Technical Specifications
UFR	Ultimate Forward Rate
USP	Undertaking Specific Parameters
VA	Volatility Adjustment

1. Background

1. *"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.*[1]*"*

2. *"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*[2]*".*

3. *"EIOPA shall, in cooperation with the ESRB, initiate and coordinate Union-wide assessments of the resilience of financial institutions to adverse market developments".* To that end, *"EIOPA shall develop the following, for application by the competent authorities*[3]*:*

   a) common methodologies for assessing the effect of economic scenarios on an institution's financial position.

   b) common approaches to communication on the outcomes of these assessments of the resilience of financial institutions."

4. Persistent low risk free rates and relevant volatility in equity markets characterize the current EU financial sector, making market risks the main source of concerns regarding the stability of the insurance industry.[4]

5. In pursuit of its mandate of oversight and based on the experience gained during the 2014 stress test exercise, EIOPA decided to run a focused stress test exercise in 2016, testing the resilience of the EU insurance sector to a prolonged low yield environment and to a double-hit scenario encompassing both low risk free rates and higher risk premium.

6. The EIOPA 2016 stress test exercise will be based on the Solvency II framework standards and reporting.

7. The double-hit scenario for the EIOPA 2016 stress test has been developed in coordination with the ESRB.

[1] Art. 23 (1) EIOPA Regulation (EU) No. 1094/2010.
[2] Recital 14 EIOPA Regulation (EU) No. 1094/2010.
[3] Art. 21 (2) b and 32 (2) EIOPA Regulation (EU) No. 1094/2010.
[4] Refer to EIOPA (2015) Financial Stability Report, December 2015. Available at: https://eiopa.europa.eu/financial-stability-crisis-prevention/financial-stability/financial-stability-reports. And ESRB (2015) ESRB report on systemic risks in the EU insurance sector, December 2015. Available at: https://www.esrb.europa.eu/pub/html/index.en.html

8. In line with its Regulation, one objective of the EIOPA stress test is to assess the resilience of insurance undertakings in the EU to adverse market developments and assess the potential for systemic risk to increase in situations of stress. Additionally, the evaluation of the exercise will be based on EU wide consistency and cross border comparability of the outcomes. Therefore the EU-wide stress test is not a substitute, to any undertaking specific stress tests carried out under the Pillar 2 requirements (i.e. ORSA) prescribed by Solvency II.

2. Stress Test Framework 2016

9. Consistent with its focused nature, the stress test 2016 combines a quantitative and qualitative exercise according to the following two scenarios:[5]
   - Scenario 1 – "low-for-long scenario" (LY) focused on a prolonged low interest rate environment
   - Scenario 2 – "double-hit scenario" (DH) combining
     1. A low interest rate curve
     2. A market stress

2.1 Background and cornerstones to the exercise

10. Interest rates remain at a low level and no changes in this trend are foreseen for the near future. The opinion issued by EIOPA on the Supervisory response to prolonged low interest rates in 2013 [6] therefore remains current.

11. In this context, one specific module of the EIOPA insurance stress test in 2014 was a direct follow-up to this Opinion and addressed three key questions related to the impact of the low yield scenario: *i)* What is the scale of the challenge posed by such scenarios? *ii)* What is the scope of the challenge posed by such scenarios? *iii)* What is the timeline for serious problems to emerge?

12. The findings of the 2014 stress test exercise were the basis for general recommendations issued by EIOPA to the National competent authorities (NCAs)[7]. The cash flow analysis contained in the Low Yield Module, although with known limitations, in particular the limited range of asset cash flows modelled, suggested that there may be some time before vulnerable undertakings could face net cash outflows. This is the positive side of the outcome but it also underscored the need for NCAs to further scrutinize undertakings' cash flow analysis in terms of sustainability, paying particular attention to assets with cash flows that are difficult to model. Based on this outcome the NCAs were recommended, where the vulnerabilities are relevant, to engage with undertakings to address the following issues: *i)* Assess their ALM and risk management

[5] In the document we refer to three scenarios by including the baseline scenario (0) beside the two stressed scenarios listed in the paragraph.
[6] EIOPA (2013) "Opinion on Supervisory Response to a Prolonged Low Interest Rate Environment" (EIOPA-BoS-12/110).
[7] https://eiopa.europa.eu/Publications/Surveys/EIOPA%20Stress%20Test%20General%20Recommendations.pdf

strategies and practices in terms of sustainability and the degree to which underlying risks are addressed; and *b)* Ensure that undertakings properly assess the sustainability of the guaranteed rates that are offered. NCAs were also recommended in the context of a low yield environment to take supervisory measures to deal with undertakings deemed to be operating unsustainable business models.

13. In the 2016 exercise, EIOPA will further investigate the reinvestment risk and compare the maturity-rate bucketing of assets and liabilities. To that aim, the analysis of the Macaulay duration of the liabilities will be complemented with a measurement of the sensitivity of the liability cash flows to the low yield scenario. Additionally, the 2016 exercise will investigate the effect of derivatives on the SCR sensitivity to a decline in interest rates. Unless NCAs make it compulsory in their national market, the derivate assessment is optional.

2.2 Approach

14. The 2016 EIOPA stress test exercise will involve calculations performed by insurance undertakings on the impact of low interest rate scenarios in isolation, as well as in combination with a severe drop in assets prices, on their overall balance sheet and related asset and liability values based on a bottom-up approach.[8]

15. Recent economic developments indicate a high probability for a fall in both interest rates and market prices. This situation reinforces the need for a "double-hit" scenario in the EIOPA 2016 stress test exercise, meaning in this context the occurrence of both a downward shift of the interest rate curves and an increase in the spreads of EU government bonds.

16. The low-for-long scenario will differ from the baseline with respect to the prescribed interest rate term structure. The interest rate term structure will reflect historic and hypothetic developments possible in the context of a prolonged period of low interest rates. Participants shall use the stressed currency specific term structures provided in the complementary spreadsheet.

17. Since the use of derivatives to manage interest rate risk is material in some jurisdictions, EIOPA will investigate the effects of those instruments on the SCR. Unless specific NCAs make it compulsory, data for the estimation of the effects of the use of derivatives on SCRs under stressed scenarios shall be provided on a voluntary basis.

18. The quantitative analysis of the EIOPA 2016 stress test exercise is complemented by a set of questions regarding insurers' likely

[8] Bottom-up tests are generally run by the supervised institutions themselves using their internally developed models. An important difference to top-down tests is that the models are undertaking-specific. In the EIOPA 2016 exercise the scenarios/stresses are prescribed.

dynamic responses to some of the adverse scenarios. To this end, for the double-hit scenario, a set of questions have been developed in consultation with the ESRB.

3. Stress test framework

3.1 Low for Long (LY)

19. This scenario assesses the impact of a long-lasting low yield scenario with low rates for all maturities.

20. It is based on a situation of secular stagnation. Savers facing a lack of long term investment opportunities and permanently low productivity growth - combined with a scarcity of risk free assets - drive down yields at all maturities.

21. In view of this EIOPA designed a specific low curve of the risk free rate developed on the lowest spot rate observed in the market in recent periods. Due to the low-for–long nature of the scenario, the extrapolated part of the curve, defined according to the Solvency II methodology, is projected utilizing a reduced ultimate forward rate defined according to the assumption of the scenario.

3.2 Double –hit (DH)

22. EIOPA, in cooperation with the ESRB, developed a hypothetical market stress scenario with a view to assess the vulnerability of the insurance sector to market risks.[9]

23. The market variables included are:

- Interest rate stresses for maturities of 1, 2, 5, 10, 20 and 30 years[10];
- Equity stresses for the stock market (drop in prices);
- Corporate bond stresses – Financials[11] (yield increase) for the EU-aggregate market for rating classes: AAA-AA-A-BBB-BB- B or lower -unrated;
- Corporate bond stresses – Financials covered (yield increase) for the EU-aggregate market for rating classes: AAA-AA-A-BBB-BB-lower B-unrated;
- Corporate bond stresses – Non-Financials (yield increase) for the EU-aggregate market for rating classes: AAA-AA-A-BBB-BB-lower B-unrated;
- Government bond stresses for the EU countries (yield increase);

[9] Detailed information on the scenario can be retrieved at: https://www.esrb.europa.eu/mppa/stress/html/index.en.html

[10] Complete term structure is derived according to the EIOPA standard methodology based on the Smith-Wilson approach, hence 30y maturity is utilized only where required. Shocks are applied to the relevant market rates curve (e.g. par swap rates). For other currencies (i.e. non-Euro), a derived multiplier of the euro curve is used to define the 'shifts' which need to be applied to the basic risk free curve of that currency to get to the 'stressed' curve. The multiplier designed to equal the relative change of best estimates for all currencies in each scenario compared to the baseline.

[11] Including securitised assets

- Stresses for residential property prices on EU country bases (drop in prices);
- Stresses for commercial property prices on EU country bases (drop in prices).
- Alternative investments: (drop in prices) for private equity, Real Estate Investment Trusts (REITs), hedge funds, and commodities.

24. The stresses defined as part of the scenarios were derived assuming a simultaneous and instantaneous occurrence of the assumed shocks. One implication is that the resulting impacts from stress in different market segments do not need to be further aggregated by means of a "correlation matrix".

4. Scenarios

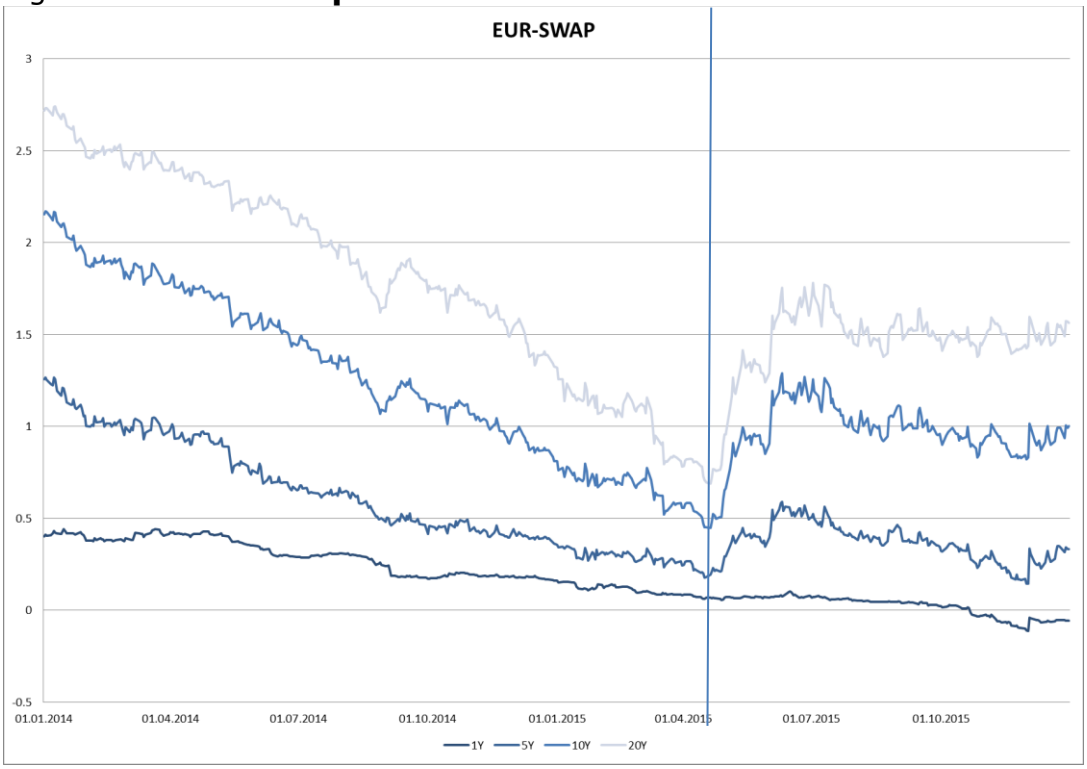
25. EIOPA includes two dedicated market stress scenarios reflecting the current EIOPA/ESRB assessment of prevailing systemic risks to the financial system. The first scenario developed internally, aims at assessing the resilience of undertakings to a prolonged low interest rate market. The second scenario developed in cooperation with ESRB encompasses a set of market shocks triggered by two simultaneous events: a shock in government bond prices and a drop in the risk free rate curve. The so called "Double-Hit" is meant to reflect financial market dynamics at the global level which give rise to a worldwide shock to financial prices including government[12] and corporate bond yields as well as equity prices and other investments. The results based on the two scenarios should provide information not only about the effects of some particular set of stress conditions, but also about how sensitive these effects are to variations in the magnitude and composition of shocks.

4.1 Low for Long scenario (LY)

26. For the purpose of assessing the inherent risks, EIOPA derived a specific curve[13] based on the interest rate term structures observed for the Euro Area (EA) in the past 2 years. More specifically the curve originates from the lowest rate registered for different maturities of the EUR-SWAP curve in the defined time-frame (see figure 1), namely the data registered on the 20/04/2015.

[12] Including public sector bonds.
[13] Consistent with the Solvency II methodology the term structure is extrapolated via Smith-Wilson method.

Figure 1**– Euro-Swap curve**



Source: Bloomberg

The stressed curve is generated via Smith-Wilson according to the following approach:

i. last liquid point (LLP) set at 20Y coherently with the LLP used for the definition of the EIOPA risk-free interest rate term structures;

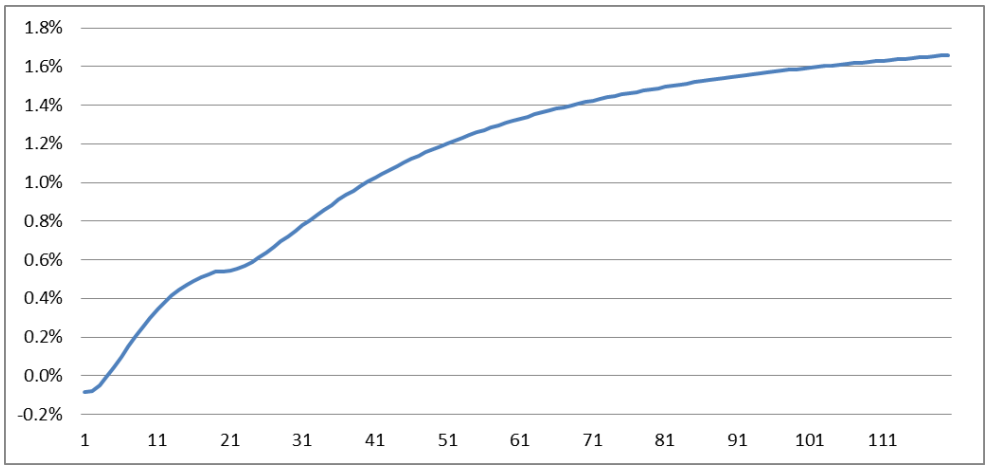
ii. assuming an extreme scenario of no-growth in the next 60 years for the EA, the ultimate forward rate (UFR) set at 2.0% according to the inflation target set by ECB;

iii. the liquid part of the curve is treated with a downward shock of 15 basis points (bps) including the credit risk adjustment.[14]

[14] As spreads are constant CRA is kept unchanged (10 bp).

Figure 2 displays the stressed curve.

Figure 2 – Interest Rate Curve for Low-for-Long Scenario



27. For other currencies, a derived multiplier of the euro curve is used to define the "shifts" which need to be applied to the basic risk free curve of that currency to get to the "stressed" curve.[15] The complete term structure of the interest rates for different currencies is available at EIOPA-16-112 Technical Information.[16]

28. For the LY scenario all other parameters, such as spreads, shall be considered unchanged with reference to the valuation before stresses are applied.

4.2 Double-hit scenario (DH)

29. The scenario represents an extreme situation triggered by two events[17] that were not observed simultaneously in the past, namely a rapid increase of all sovereign bond yields of the EU countries complemented by a drop in the risk free rate. Shocks to sovereign bonds are reflected in other financial market by increase in the corporate bond yields and a drop in values of stocks and the prices of other asset classes.

30. Participants shall apply the stresses proposed in table 1 in accordance with the following paragraphs. Whenever the stresses are different per country, geographical area or currency they should apply only to the countries and currencies included in the current

[15] GBP term structure has the LLP set at Y50, hence stresses coming from the reduction of the UFR shall be applied from Y51 onwards. To that aim, to derive the LY GBP curve, an approach that neutralizes the effect of the reduction of the UFR for maturities between Y20 and Y50 was applied.
[16] The document can be retrieved at: https://eiopa.europa.eu/Pages/Financial-stability-and-crisis-prevention/Stress-test-2016.aspx
[17] As the two shocks are not independent the joint probability of the two triggering events is lower than the product of the probability of the two events taken separately.

specifications and technical information (see technical information at EIOPA webpage). For instance corporate bonds are shocked globally regardless of the country of issuance, while equities outside EU/EEA are not shocked in this exercise. As an example, table 1 should be interpreted as follows:

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 to a reduction of the swap rate by 61 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 shocks levels for sovereign or corporate yields in table 1 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 table 1 by $\Delta CreditSpread_{Bond} = \Delta Y_{Bond} - \Delta SWAP$
d. In order to provide an illustrative example assume that the pre-stress level of the 10 year SWAP rate is 1.0% and that a Belgian 10 year sovereign bond is priced with a credit spread of 10 bps. The yield of this bond before shock therefore amounts to 1.1%.
   According to table 1 the shock on the 10 year SWAP rate implies a reduction of 61 bps (i.e. $SWAP_{Shock} = 0.39\%$) and a yield increase for the sovereign bond of 116 bps (i.e. the yield after shock is 1.1%+1.16%=2.26%).
   Using the formula specified in c) the credit spread for this bond increases by 177 bps (= 116 bps – (-61 bps)), i.e. the credit spread after shock is 187 bps (=2.26% - 0.39%).
e. The shocks to loans and mortgages should refer to the covered bonds. In case no assessment of the risk of this asset class exists, IUs must apply the unrated covered bonds shock. Otherwise they should refer to the corresponding covered bonds shock.

31. Shocks are assumed to be instantaneous and occur at the same time in an independent manner. For this reason, no correlation matrix is provided, notwithstanding the intrinsic or historical dependencies between types of events.

32. Second level or contagion effects are out of scope of the quantitative part of the 2016 Stress Test exercise, hence no impacts on the creditworthiness of asset holdings and reinsurance recoverables (namely credit risk) are taken into account.

Table 1 - Overview of the stress test parameters for the DH scenario

Shocks to EURO-SWAP rates							
Maturity (Y)	1	2	3	5	7	10	20
Shocks (bp)	-60	-65	-77	-71	-72	-61	-61

For the complete term structure of the risk free rate for all the relevant currencies refer to the Technical Information published at EIOPA webpage.

Shocks to sovereign bond yields in EU Countries (bp)						
	2Y	**5Y**	**10Y**	**15Y**	**20Y**	**30Y**
Austria	40	81	102	97	87	90
Belgium	40	86	116	105	106	100
Bulgaria	43	80	111	99	96	86
Croatia	68	119	155	138	135	120
Cyprus	45	91	132	118	115	102
Czech Republic	53	86	100	98	96	85
Denmark	41	82	94	101	85	76
Estonia*	52	100	121	110	98	89
Finland	39	88	102	101	92	49
France	37	89	112	104	102	104
Germany	33	74	92	95	79	73
Greece	204	370	487	303	298	258
Hungary	105	133	170	154	150	133
Ireland	55	86	108	126	123	109
Italy	103	154	166	148	146	136
Latvia	45	117	136	121	118	105
Lithuania	56	127	135	120	117	104
Luxembourg	40	72	95	85	82	73
Malta	56	105	139	124	121	107
Netherlands	36	89	99	94	91	81
Norway**	41	78	86	86	89	71
Poland	58	133	142	131	142	116
Portugal	102	165	197	150	127	123
Romania	86	123	162	144	141	125
Slovakia	58	85	95	78	76	68
Slovenia	73	117	146	130	127	113
Spain	91	151	167	156	164	145
Sweden	42	73	78	79	88	81
United Kingdom	46	94	94	95	73	61
European Union	52	100	121	110	98	89

* Shocks to Estonia are proxied with the EU average due to lack of liquid sovereign debt instruments.
** Shocks to Norway's sovereign bonds are proxied by computing the average of the shocks applied for different maturities to two neighbour countries' sovereign bonds.

Shocks to corporate bond yields (bp)							
	AAA	AA	A	BBB	BB	B<=	unrated
Non-Financials	24	120	135	214	260	323	350
Financials	16	116	198	372	432	484	516
Financials Covered	20	72	115	162	207	230	247

Shocks to stock prices in EU countries (% drop of end-2015 market value)			
Country	(%)	Country	(%)
Austria	-35.8	Latvia	-17.1
Belgium	-30.6	Lichtenstein	
Bulgaria	-20.9	Lithuania	-30.1
Croatia	-20.4	Luxembourg	-27.1
Cyprus	-27.6	Malta	-22.3
Czech Republic	-27.0	Netherlands	-34.1
Denmark	-30.9	Norway**	-32.0
Estonia*	-33.4	Poland	-26.3
Finland	-31.0	Portugal	-31.3
France	-35.6	Romania	-25.1
Germany	-34.1	Slovakia	-22.0
Greece	-34.2	Slovenia	-24.2
Hungary	-25.1	Spain	-35.8
Ireland	-31.3	Sweden	-28.4
Italy	-36.5	United Kingdom	-32.9
European Union		-33.4	

* Shock to stock prices in Estonia are proxied with the European Union average.
** Shock to stock prices in Norway are proxied by computing the average of the shocks applied to stock prices in two neighbour countries.

Shocks to other asset classes (% drop of end-2015 market value)				
	Private equity	Hedge Funds	REIT	Commodities
Global	-23.3	-4.8	-22.4	-16.2
EU	-23.5	-2.3	-26.2	-6.8

Shocks to residential property prices in EU countries (% drop of end-2015 market value)			
Country	(%)	Country	(%)
Austria	-7.4	Latvia	-9.8
Belgium	-2.6	Lichtenstein*	-10.8
Bulgaria	-4.4	Lithuania	-13.1
Croatia	-14.6	Luxembourg	-10.8
Cyprus	-2.4	Malta	-4.0
Czech Republic	-1.4	Netherlands	-6.7
Denmark	-5.8	Norway**	-4.6
Estonia	-8.9	Poland	-7.5
Finland	-4.7	Portugal	-2.5
France	-5.3	Romania	-7.0
Germany	-2.3	Slovakia	-9.8
Greece	-4.0	Slovenia	-1.9
Hungary	-4.2	Spain	-9.0
Ireland	-8.9	Sweden	-4.6
Italy	-3.2	United Kingdom	-14.2
European Union		-6.7	

* Shocks to residential property prices in Lichtenstein are proxied with the shocks applied to residential property prices in Luxemburg.
** Shocks to residential property prices in Norway are proxied by computing the average of the shocks applied to residential property prices in two neighbour countries.

Shocks to commercial property prices in EU countries (% drop of end-2015 market value)			
Country	(%)	Country	(%)
Austria	-6.4	Latvia	-7.5
Belgium	-1.4	Lichtenstein*	-7.6
Bulgaria	-2.2	Lithuania	-8.2
Croatia	-2.5	Luxembourg	-7.6
Cyprus	-1.4	Malta	-5.8
Czech Republic	-2.1	Netherlands	-11.4
Denmark	-11.1	Norway**	-3.7
Estonia	-5.2	Poland	-3.0
Finland	-3.2	Portugal	-2.4
France	-4.4	Romania	-5.7
Germany	-3.4	Slovakia	-5.6
Greece	-6.5	Slovenia	-0.4
Hungary	-2.7	Spain	-6.6
Ireland	-9.6	Sweden	-4.2
Italy	-6.6	United Kingdom	-14.7
European Union		-6.0	

[18]

* Shocks to commercial property prices in Lichtenstein are proxied with the shocks applied to commercial property prices in Luxemburg.
** Shocks to commercial property prices in Norway are proxied by computing the average of the shocks applied to commercial property prices in two neighbour countries..

5. Scope, Timing and Process of the 2016 Stress Test

5.1 Scope - Criteria for the minimum market coverage rate

33. 2016 stress test exercise focuses on solo insurance undertakings deemed to be more vulnerable to a low interest rates environment. The aim of the 2016 exercise is to enlarge the coverage of the 2014 exercise both from a market and scope perspective.

5.1.1 Scope

34. The sample shall include solo life and mixed insurers offering any type of interest guaranteed products. Selected undertakings shall be representative of each national market. Moreover, in order to fully assess the insurance markets, each national sample shall include an adequate number of medium and small sized undertakings and mutuals.

5.1.2 Coverage

35. The selection of undertakings lies with the NCAs subject to the following EIOPA minimum market coverage criteria. The sample of participants shall include a coverage of a minimum of 75% of the national market share in terms of gross life technical provisions (excluding health and index-linked and unit-linked) by year-end 2015.

[18] The path for commercial property prices was separately provided by ECB staff and is consistent with the ESRB macro-financial scenario.

36. Taking into account the specificity of each jurisdiction, NCAs shall apply a principle of proportionality in the sampling process. In order to avoid that rather small solo undertakings either at country level or EU level are represented, a reduction of the market share coverage from 75% to 50% will be allowed, where, in order to reach the 75% threshold, NCAs would need to include undertakings:

    i. representing less than 1% of the national market of gross life technical provisions (excluding health and index-linked and unit-linked) (at year end 2015)

    Or

    ii. with gross life technical provisions (excluding health and index-linked and unit-linked)below EUR 50 Million (at year end 2015).

5.2 Timing

37. From the official launch of the 2016 stress test by end of May 2016, the participants' results will need to be submited to the respective NCA no later than the 15 of July 2016[19]. The submission from participants will be validated at national level until the end of August followed by a European-wide validation process until the end of September; therefore stress test participants need to stand-ready to reply to potential NCAs' requests for clarifications or resubmissions up to the third week of September; the communication of EU stress test results is envisaged by end year 2016.

5.3 Process Milestones

38. A set of specific stress test reporting templates is provided on the launching date of the exercise. These have been developed with the intention to be as consistent as possible with the relevant SII QRTs (quantitative reporting templates).

39. To ensure across-the-board consistency, EIOPA will coordinate a centralized question and answer process from the official launching until end of June 2016. In addition, a multi-layer quality assurance analysis process will follow both at national and European level.

6. Disclosure

40. The public report of the 2016 EIOPA stress test will enhance the transparency of the results. Hence EIOPA, within the remit of its mandate and the non-pass/fail nature of the exercise, will not disclose direct links between names and solvency ratios, but rather

[19] NCAs should allow for flexibility when needed, considering the resources availability on a case by case basis.

will disclose in an anonymized or aggregated way the sensitivity of undertakings to the applied stresses.

7. Valuation Basis & Technical Specifications

41. The valuation of the pre-stress test balance sheet will be based on Solvency II and so the pre- and post-stress figures (e.g. balance sheet and cash flows) will be based on the related technical specifications.

42. The reference date for the exercise will be 01/01/2016 (i.e., valuations of all figures (i.e. pre- and post-stress) are requested in reference to this date).

43. The impact of LTG and transitionals should be included in the analysis, hence for the purpose of the stress test IUs are requested to apply any LTG and transitional measures approved by the reference NCA (if an approval is needed in the specific jurisdiction). In case an IU plans to apply LTG measures, results have to be provided with and without the effect of LTG measures. In case no approval for the application of VA has been granted, IUs are required to include a notification of this. Information on the impact of transitionals on technical provisions and interest rates is already included in the templates for the baseline scenario. In addition, the impact of all LTG measures and transitionals together is included as part of the collected post stress information.

44. In order to serve the purpose of the stress test exercise to correctly identify the sectoral vulnerabilities, the treatment of the LTG-measures is as follows:

    1. The volatility adjustment and the matching adjustment shall be included in the stress test framework, in alignment with Solvency II rules. As such, EIOPA will provide the recalculated VA figures following the DH scenario.

       For the LY scenario, credit spreads shall be assumed to be constant[20] after applying the instantaneous shock on the basic risk free rate implying no changes in e.g. the volatility adjustment.

    2. The adjustments derived from the transitional measures both on the risk-free interest rates and on technical provisions[21] shall be calculated in the pre-stress scenario and then be kept constant in the post-stress scenario. This is in line with the standard formula approach to assess the impact of the transitional measure. However, to recognize that in a context other than the stress test, the transitional adjustments post-stress scenario would likely be

[20] Meaning unchanged relative to valuation before stress scenarios are applied.
[21] Calculated in accordance with the Art. 308c and 308d of OMD-II respectively.

recalculated, subject to supervisory approval, the stress test template additionally allows IUs to report for an (optional) full recalculation of these transitionals .

45. For the liability cash-flow run-off projections, participants should take into account future cash-flows items within the Solvency II contract boundaries. Liability cash flows shall be reported gross of reinsurance.

46. Participants shall provide the liability cash flow projections which once discounted with the relevant risk-free curve, and summed, give the best estimate value of the technical provisions for the low for long scenario and this projection should cover a 60 year time horizon.

47. For the stress test purpose, figures shall be generated coherently with the model applied by undertakings for Solvency II valuation principles including the calculations of the capital requirements. Use of (partial) internal model and USPs, should have been approved by the NCA.

48. Stresses on equity shall be applied as follow:
    a. Equity of companies listed in one stock exchange: the shock of the country where the company is listed shall be applied;
    b. Equity of companies listed in more than one stock exchange: the average EU shock to equity shall be applied;
    c. Equity of non-listed companies: the average EU shock to equity shall be applied;
    d. Strategic participation: the shock to EU private equity shall be applied.

49. For the optional (unless made compulsory by the relevant NCA) assessment of the effect of derivatives on the solvency of IUs, the SCR under the baseline and LY scenario shall be provided with and without the hedging of interest rate risk combined with interest rate sensitivity. The SCR shall be calculated as follows:
    a. taking all assets, liabilities and derivatives into account;
    b. taking into account only derivatives that expire after 12, 24 and 36 months on the date of calculation to esimate the SCR, in sequences;
    c. not taking any derivatives into account.

    IUs are also asked to calculate the interest rate sensitivity in each table with different methodologies (Dollar and effective duration[22]).

50. In each step an interest rate sensitivity is calculated by participants without taking future asset and liability duration shortening into account. All calculations are performed in the baseline and low yield

[22] The effective duration shall be approximated by dividing the change in the present values of cash flows under baseline and stressed scenario by $2*PV_0*\Delta Y$ where PV_0 is the present value of the cash flows under the baseline scenario and ΔY represent the change in the internal rate of return of the 2 cash flows.

scenario respectively and at the same calculation date (YE 2015), i.e. no forward projects including the calculations of the capital requirements. Use of (partial) internal model and USPs, should have been approved by the NCA.

8. Templates & Reporting Output

51. Participants shall fill in the reporting templates in the provided spreadsheet. The reporting templates are grouped in three main sections:
    a. Baseline scenario (0)
    b. Double hit scenario (DH)
    c. Low for long scenario (LY)

52. Templates are mainly based on the Solvency II Day 1 reporting with some additions. Additional data are mainly based on Yearly reporting standard templates where relevant information is not covered by the Day 1 standard reporting. Table 2 illustrates an overview of the content of the spreadsheet.

53. In the context of the 2016 ST exercise any country based Solvency II exemption should not be taken into account, hence any ST compulsory template shall be filled-in.

Table 2 - Content of Reporting Templates

54. Information on the content of the QRT submission can be retrieved from the Supervisory Reporting Annex II

	Baseline (0)	Double Hit (DH)	Low for Long (LY)
Balance sheet	0.BS	DH.BS	LY.BS
Minimum Capital Requirement	0.MCR		
MCR.Components	0.MCR.Comp		
Solvency Capital Requirement - Standard Formula	0.SCR.SF		
Solvency Capital Requirement - Partial Internal Model	0.SCR.PIM		
Solvency Capital Requirement - Full Internal Model	0.SCR.IM		
Own Funds	0.OF	DH.OF	LY.OF
Impact of long term guarantees measures and transitionals	0.LTG	DH.LTG	LY.LTG
Assets Bucketing	0.Assets		LY.Assets
Duration and Long Term Guarantees components	0.Liabilities.Char		
Liabilities Cash Flows	0.Liabilities.CF		LY.Liabilities.CF
Qualitative information on calibration and calculation			LY.Q
Qualitative Questionnaire		DH.Q	
Derivatives	D.Derivatives		

55. Balance sheet (0.BS, DH.BS, LY.BS)

    Balance sheet templates are based on the QRT Day 1 Solvency II reporting Solo S.02.01.02. The baseline scenario template (0.BS) fully replicates the QRT template. Stressed scenarios' templates (DH and LY) require a lower degree of details on the investment side.

As a simplification and given that the recalculation of the SCR is not required, the risk margin post-stress should be the risk margin in the baseline scaled with the best estimate.

56. Minimum Capital Requirement (0.MCR)

The MCR template replicates the Day 1 Solvency II reporting Solo S.28.01.01. This template shall be filled in only by pure Life or non-life undertakings.

57. Minimum Capital Requirement Composite undertakings (0.MCR.Comp)

The MCR.Comp template replicates the Day 1 Solvency II reporting Solo S.28.02.01. This template shall be filled in only by composite undertakings.

58. Templates devoted to the collection of data on the Solvency Capital Requirement (SCR.SF, SCR.PIM, SCR.IM) are mutually exclusive. Undertakings shall fill in only the template in line with the utilized approach to report, namely the SCR.SF in case of no authorization for full or partial internal model, or SCR.PIM and SCR.IM in case authorization for partial internal model or full internal model respectively were granted by the NCA.

59. This exercise is not aimed at assessing the SCR after stress, therefore undertakings:
    a. shall provide the SCR calculation under the baseline scenario;
    b. shall not provide SCR figures calculated under stressed scenarios. Regarding the optional (unless made compulsory by the relevant NCA) assessment of the effect of derivatives, the recalculation of SCR is a part of the analysis.

60. Solvency Capital Requirement – Standard Formula (0.SCR.SF,)

The SCR.SF template replicates the Day 1 Solvency II reporting Solo S.25.01.01. The SCR calculation is mandatory only under the baseline scenario (0.SCR).

61. Solvency Capital Requirement – Partial Internal Model (0.SCR.PIM,)

The SCR.PIM template replicates the Day 1 Solvency II reporting Solo S.25.02.01.

62. Solvency Capital Requirement – Full Internal Model (0.SCR.IM)

The SCR.IM template replicates the Day 1 Solvency II reporting Solo S.25.03.01.

63. Own Funds (0.OF, DH.OF, LY.OF)

OF templates replicate for the three scenarios the Day 1 Solvency II reporting Solo S.23.01.01.

64. Impact of long term guarantees measures and transitionals (0.LTG, DH.LTG,LY.LTG)

The templates are based on the S.22.01.01 Annual Solvency II reporting Solo. General information on the content of the submission can be retrieved from the Supervisory Reporting Annex II. More specifically for the baseline scenario (0.LTG) a step-by-step approach on the impact of LTG and transitionals on technical provisions, basic own funds, eligible and own funds is required. For the two stressed scenarios only total amounts are required.

65. The exercise aims at measuring the overall effects of the application of LTG and Transitionals. Therefore, IUs using these measures need to disclose the effect of the LTG and Transitionals limited to Technical provisions and OF (under baseline and stressed scenarios) and to SCR/MCR (under baseline scenario).

66. Assets bucketing (0.Assets, LY.Assets)

The templates are elaborated as simplifications of the S.06.01.01.01 and S.06.02.01.01 Annual Solvency II reporting solo. These "Assets" templates shall be filled under the baseline scenario (0.Assets) and under the low yield scenario (LY.Assets).
Market valuation shall be provided for the asset classes with foreseeable cash flows computed according to the methodology internally applied by undertakings. Assets shall be provided according to the following asset classes:

- Government bonds, including other public sector bonds
- Corporate bonds, investment grade, non-investment grade and non-rated
- Others:
    - Structured notes
    - Collateralized securities
    - Other (unrated) fixed income
    - Loans and Mortgages
    - Other assets for which a cash flow pattern can be obtained

Equity and related dividends shall not be included. The 0.Assets tab is complemented by three other tables: an assessment of the sovereign bond portfolio and two breakdowns of the corporate bonds holdings by credit quality. Floating rate notes should be reported in "Others" with their market value and the associated coupon level.

67. Liability Cash Flows (0.Liabilities.CF, LY.Liabilities.CF)

Liability.CF templates shall be filled in under the baseline scenario (0.Liabilities.CF) and under the low yield scenario (LY.Liabilities.LY).

The baseline template replicates the Annual Solvency II reporting Solo S.13.01.01 template with an additional break-down of the cash outflows. In order to ensure the comparability of the reported data, IUs are required to provide the split between the guaranteed part and the discretionary part of future benefits related to the different product categories. The cash outflows from future benefits that are not discretionary shall be reported under the "Future Benefits: Guaranteed Part". The cash outflows from future benefits that depend on specific circumstances, such as company profits, shall be reported under the "Future Benefits: FDB" part.
The Low-yield scenario template is based on a simplified version of the Annual Solvency II reporting Solo S.13.01.01, hence general information on the content of the submission can be retrieved from the Supervisory Reporting Annex II. .
In order to reduce the complexity, cash flows calculations shall be based on year-end figures. Liabilities cash flows shall be reported gross of reinsurance.

68. Duration and Long Term Guarantees components (0.Liabilities.Char)

The template elaborates on the Annual Solvency II reporting Solo S.12.01.01 on Life and Health SLT Technical Provisions.
In addition it requires information on the remaining time of the contract term. The liabilities shall be divided into buckets according to the guaranteed rate and the remaining time for which this guarantee is still valid. In the case of a life-long guarantee, the cell "n.a." shall be filled in. This table shall be filled in with Solvency II best estimate values. However, in case IUs cannot provide this breakdown, mathematical reserves computed with Solvency I values are also allowed.

69. Impact of derivatives

The three tables grouped under the sheet "D.Derivatives" are devoted to assess the impact of derivatives on the SCR under different scenarios. These tables are addressed to those undertakings materially exposed to derivatives, hence, unless NSAs make it compulsory in their national market, they are to be filled in on a voluntary basis. The partial/total exclusion of derivatives in the calculation of the requested figures is required only for this specific template.

70. Qualitative and complementary information on calibration and calculation (LY.Q)

The template encompasses seven tables. The first five tables are aimed at collecting qualitative information about the type of model used, calibration approaches, scenario generations and their application. Table 6 and 7 serve to gather quantitative information on the best estimates of lapses assets.

71. The lapses table used by IUs in the baseline shall be reported in the table "6" of the LY.Q tab. This table is to be filled in with percentages of the initial value considering lapses as all possible ways to fully or partly terminate an insurance policy.[23]

72. The Asset table ("7") should be filled in with future asset positions (total amount of assets, percentage fixed income instruments, duration of fixed income instruments) consistent with the BE model used for the valuation of liabilities. Companies using stochastic BE models should fill in the average across scenarios at each future point in time.

73. Valuations of the liability figures after each proposed stress scenario is applied will require changes of the underlying LTG measures (i.e. volatility adjustment) as this would allow a better comparison of the valuation figures before and after each proposed stress scenario. EIOPA provides the risk free term structures including the value of the volatility adjustment after the proposed scenarios[24].

74. Impact of long term guarantees measures, transitionals and equity measures (LTG.LTG)

    This tab builds upon the template S.22.01.01 of the annual supervisory reporting of solo undertakings for Solvency II. The information on the impact of long-term guarantee measures and transitionals is linked to the tab "Impact of long term guarantees measures and transitionals in the baseline scenario (0.LTG)" and will be updated automatically.

    Additionally, participants are requested to provide information on the impact on their financial position of the symmetric adjustment mechanism to the equity capital charge (Article 106 of the Solvency II Directive) and the duration-based equity risk sub-module (Article 304 of the Solvency II Directive). Information on the impact of equity risk measures should be calculated separately, based on the amount with all LTG measures and transitionals. Participants that do not use the symmetric adjustment mechanism to the equity capital charge because they apply an internal model to quantify equity risk should enter zeros in the cells of column 'O'. Participants that do not apply the duration-based equity risk sub-module should also enter zeros in the cells of column 'P'.

75. LTG Review - Sensitivity analysis of the technical provisions and the eligible own funds to the parameters of the extrapolation (LTG.Extrapolation)

    This tab is not part of the stress test exercise but constitutes additional information to be used for the mandatory review of the

[23] Please refer to Commission Delegated Regulation (EU) 2015/35 Art 1.13 and Art 1.14 retriveable at: http://eur-lex.europa.eu/

[24] Refer to EIOPA-BoS-16-112 Technical Information at: https://eiopa.europa.eu/Pages/Financial-stability-and-crisis-prevention/Stress-test-2016.aspx

long-term guarantees measures and measures on equity risk be performed by EIOPA in accordance with Article 77f of the Solvency II Directive.
The tab collects information regarding the impact of changing the assumptions underlying the extrapolation of the relevant risk-free interest rate term structure.
Participants are requested to report the results of the sensitivity analysis required under Article 44(2a)(a) of the Solvency II Directive which they have performed by the submission date. No pre-defined scenarios are imposed by EIOPA.
If an undertaking has analysed more than ten scenarios, it is asked to report the 10 scenarios it considers most relevant. If an undertaking has analysed fewer than ten scenarios, the remaining cells should remain empty.