ESRB
European Systemic Risk Board
European System of Financial Supervision

Scenario for the European Insurance and Occupational Pensions Authority's EU-wide insurance stress test in 2016

Introduction

In accordance with its mandate, the European Insurance and Occupational Pensions Authority (EIOPA), in cooperation with the ESRB, initiates and coordinates EU-wide stress tests to assess the resilience of financial institutions to adverse market developments. It plans to conduct a stress test this year for insurance companies. EIOPA requested the ESRB to provide an adverse macro-financial scenario for this stress test.

The adverse scenario presented in this document covers the materialisation of risks that have been identified, the underlying economic narrative and calibrated shocks to key financial market variables. The shocks that are presented should be interpreted as one-off, instantaneous and permanent shifts in asset prices relative to their end-2015 levels.

Systemic risks and vulnerabilities addressed by the scenario

The scenario reflects the ESRB's assessment of prevailing systemic risks to the financial system. A further increase in risk premia, which may potentially be triggered by emerging market stress, persistently low commodity prices or low nominal economic growth, constitutes a key source of systemic risk for the EU financial system, against a backdrop of weak financial sector profits and high private and public sector indebtedness. A possible rise in concerns over public debt sustainability remains an important high-impact risk. These risks may materialise jointly and reinforce each other.

The key vulnerability of the European insurance sector identified by EIOPA and contained in this scenario is a "double hit", impacting both sides of insurers' balance sheets. On the assets side, 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. Such a fall could result from rising concerns about sovereign debt sustainability and a reassessment of risk premia. In addition, insurers are vulnerable to prolonged low risk-free interest rate levels, especially if these decouple from yields on investment-grade debt securities. On the liabilities side, low risk-free interest rates – often approximated with swap rates – increase the value of their long-term liabilities while compressing margins between guaranteed returns on life policies and matching long-term low risk investments. These risks are addressed by the macro-financial scenario presented here.

Narrative of the scenario

The scenario is assumed to be initiated by an abrupt reversal in global risk premia and term premia. The required rate of return for holding long-term fixed income assets would increase sharply. The corresponding decline in bond prices would be amplified by market illiquidity and additional supply coming into the secondary bond markets from shadow banking entities. These entities, which have been growing rapidly in recent years, would face increased redemptions and would be forced to dispose of investments. At the same time, concerns about the creditworthiness of some EU sovereigns would be reignited, introducing some differentiation in the impact on bond yields of EU countries. Yields on non-financial corporate and bank debt would increase too, following the generalised increase in risk premia. In the banking sector, shocks to credit spreads would be aggravated by fundamental concerns about prospective mark-to-market losses on fixed-income assets. AAA-rated corporate bond yields would barely increase, but the impact on credit spreads would be more pronounced for weaker issuers. As prospects for future earnings by the European corporate sector would deteriorate, driven primarily by a higher cost of finance and lower expected aggregate demand, stock prices would fall. Finally, excess liquidity created by sales of financial assets would be invested in very short-term assets, pushing money market rates down and reducing forward interest rates. This would result in a fall in swap rates, which reflect expected future short-term interest rates.[1]

Calibration of the scenario

A non-parametric, conditional expected shortfall technique has been employed to derive the shocks in the scenario.[2] The "double hit" implies, by its nature, that the past close relationship between swap rates and yields on high-quality government bonds would be disrupted. For this reason, the scenario is not internally consistent and does not include the safe-haven effects historically observed in high-quality government bonds (see Chart 1). It is assumed that two financial market shocks would materialise simultaneously:

- a rapid increase in yields on sovereign bonds, affecting the entire yield curve and leading to a steepening of cash yield curves;
- a fall in swap rates.

These shocks would induce a response in other financial market variables, such as stock prices and corporate bond yields, which would be consistent with historical patterns.

This scenario should be interpreted as an extreme event that has not occurred since at least 2005 (see Chart 2). As it is assumed that swap rates and government bond yields, which

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[1] It is assumed that monetary policy would not respond to this shift in expectations. This assumption is made for strictly technical purposes and should be read without prejudice to any future decisions by monetary authorities.

[2] This tool, which is part of the suite of stress test models used by the ECB's Directorate General Macroprudential Policy and Financial Stability, is described in more detail in Box 2 of the adverse scenario provided for the 2015 EIOPA EU-wide pension fund stress test (see https://eiopa.europa.eu/Publications/Surveys/ESRB-2015-03-20%20GB%2021%20%20EIOPA%20%20pension%20fund%20ST%20after%20ESRB%20GB.pdf).

have been closely related in the past, would move in the opposite directions, the joint probability of the scenario is much lower than the estimated marginal probability of the two trigger events, which is set to about 0.75% for government bond yield shocks and to 0.5% for swap rate shocks, in both cases measured over a one-year horizon.

Chart 1: Historical co-movement of swap rates and German bond yields
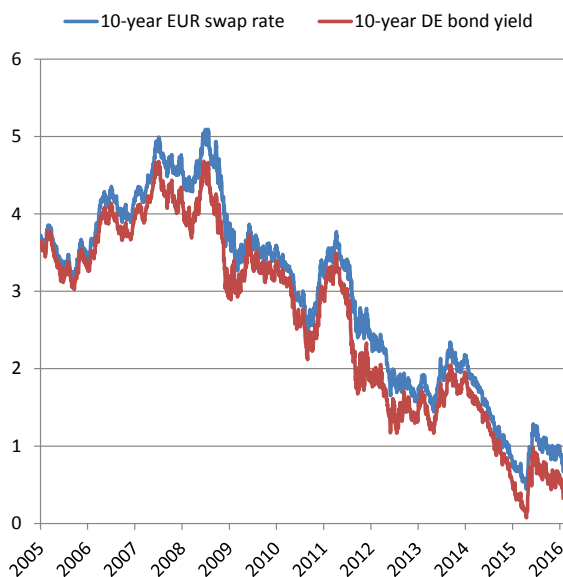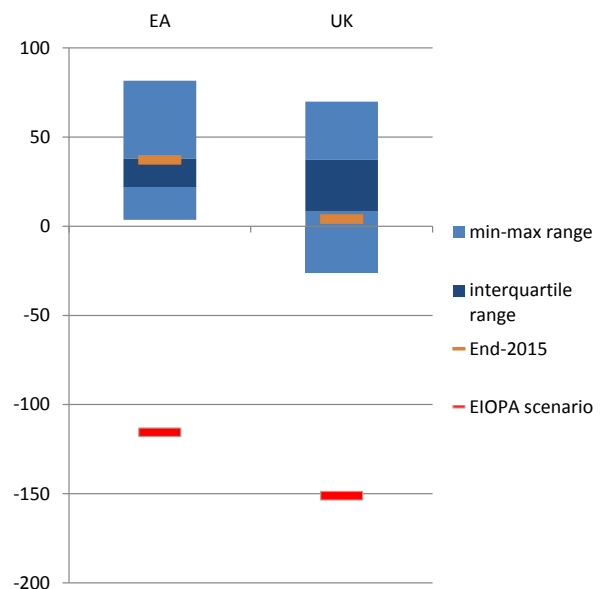
(percentages)

Chart 2: Spreads between swap rates and German and UK bond yields: historical range and shocks in the 2016 EIOPA exercise

(basis points)

Notes: Negative spreads imply that swap rates are lower than government bond yields. Historical range computed using daily data for the period between 1 January 2005 and 31 December 2015.

Under the calibrated scenario, EU government bond yields would increase, on average at the ten-year maturity, by 121 basis points (see Table 1), with the shocks to yields of individual sovereigns falling into the range between 78 basis points (Sweden) and 487 basis points (Greece). Swap rates would fall by about 60 to 70 basis points (see Table 2). As a result, the spread between the ten-year euro swap rate and the yield on German government bonds of the same maturity would reach -116 basis points, some 120 basis points below its lowest level recorded in the last ten years and some 150 basis points below its end-2015 level (see Chart 2). A similar situation would arise in the United Kingdom and most of the non-euro area EU countries.

Table 1: Shocks to sovereign bond yields and stock prices in EU countries

Country	Shocks to government bond yield by maturity (basis points)						Shocks to stock prices (%)
	2Y	5Y	10Y	15Y	20Y	30Y	
Belgium	40	86	116	105	106	100	-30.6
Bulgaria	43	80	111				-20.9
Czech Republic	53	86	100	98			-27.0
Denmark	41	82	94	101	85	76	-30.9
Germany	33	74	92	95	79	73	-34.1
Ireland	55	86	108	126			-31.3
Greece			487	303	298	258	-34.2
Spain	91	151	167	156	164	145	-35.8
France	37	89	112	104	102	104	-35.6
Croatia	68	119	155				-20.4
Italy	103	154	166	148	146	136	-36.5
Cyprus	45	91	132				-27.6
Latvia	45	117	136				-17.1
Lithuania	56	127	135				-30.1
Luxembourg			95				-27.1
Hungary	105	133	170	154			-25.1
Malta	56	105	139				-22.3
Netherlands	36	89	99	94	91	81	-34.1
Austria	40	81	102	97	87	90	-35.8
Poland	58	133	142	131	142	116	-26.3
Portugal	102	165	197	150	127	123	-31.3
Romania	86	123	162				-25.1
Slovenia	73	117	146				-24.2
Slovakia	58	85	95	78			-22.0
Finland	39	88	102	101	92	49	-31.0
Sweden	42	73	78	79	88	81	-28.4
United Kingdom	46	94	94	95	73	61	-32.9
European Union	**52**	**100**	**121**	**110**	**98**	**89**	**-33.4**

Note: Shocks were not calibrated for Estonia owing to a lack of liquid sovereign debt instruments.

Stock prices would, on average, fall by about 33%, with a significant degree of cross-country dispersion – between 17% in Latvia and 36% in Italy (see Table 1). This is deemed to be a very severe shock, constituting the third-worst year for European equities in the last three decades.[3] Non-financial corporate bond yields would increase by between 24 and 350 basis points, depending on credit standing of the specific issuer (see Table 3). The increase in bank bond yields would be even more pronounced.[4] The value of investments in private equity and

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[3] Since 1986 – this is as far as the available data go back – the annual return on the headline European equity index has been worse than -33% only in two years: 2002 (-37%, bursting of the tech bubble) and 2008 (-44%, global financial crisis). Unlike in 2002 or 2008, there is currently no evidence of fundamental overvaluation of euro area equities. See for example the ECB's Financial Stability Review, November 2015, Chart 2.15.

[4] The average maturity of the corporate and senior unsecured bank bonds used for the purpose of this calibration is close to five years, so the yield shocks presented in Table 3 should be compared with five-year swap rate shocks and five-year sovereign bond yield shocks.

real estate investment trusts (REITs) would fall by between 22% and 26% (see Table 4). Investments in residential property would fall in value by an average 6.7% in the EU, with significant heterogeneity across individual countries (see Table 5).

The proposed calibration assumes that more severe shocks to interest rates and sovereign and corporate credit spreads than those used in either of the two scenarios used in the 2014 EIOPA stress test would occur. It is somewhat more benign for EU stock prices (see Annex).

Table 2: Shocks to euro swap rates

Shocks to euro swap rates (basis points)							
1Y	2Y	3Y	5Y	7Y	10Y	20Y	30Y
-60	-65	-77	-71	-72	-61	-61	-61

Table 3: Shocks to non-financial corporate and bank bond yields

	Shocks to corporate and bank bond yields by rating (basis points)						
	AAA	AA	A	BBB	BB	B<	unrated
Non-financial corporate bonds	24	120	135	214	260	323	350
Unsecured bank bonds	16	116	198	372	432	484	516
Covered bonds	20	72	115	162	207	230	247

Table 4: Shocks to selected other asset classes (as a percentage of end-2015 market value)

Private equity		REITs		Hedge funds		Commodities	
Global	EU	Global	EU	Global	EU	Generic index	Oil
-23.3	-23.5	-22.4	-26.2	-4.8	-2.3	-16.2	-6.8

Table 5: Changes in residential property prices in EU countries

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

Annex: Comparison of the severity of the 2016 scenario with the two scenarios used in the 2014 EIOPA exercise

This annex presents a brief comparison of the calibration proposed for the 2016 exercise with the scenarios employed in the 2014 EIOPA insurance stress test. The ESRB prepared two scenarios for the 2014 exercise[5]:

- Scenario 1 triggered by an adverse shock in EU corporate bond markets ("2014 CORP");
- Scenario 2 triggered by an adverse shock in EU stock markets ("2014 STOCKS").

The proposed calibration of the increase in government bond-swap spreads in the 2016 exercise is substantially more severe than in the 2014 exercise (see Chart A1). For AAA and AA-rated sovereigns the spread between sovereign bond yields and swaps would change by about 140-180 basis points, while the corresponding shift in the more severe of the 2014 scenarios was in most cases lower than 100 basis points. Among the AAA and AA-rated sovereigns, only Luxembourg would be faced with a similar shock size as in the 2014 exercise. Less material differences would be seen for lower-rated sovereigns; in several cases the smaller size of the shock can be attributed to improved fundamentals (e.g. Ireland, Slovenia).

Chart A1: Comparison of shocks to government bond-swap spreads in the 2014 and 2016 EIOPA exercises
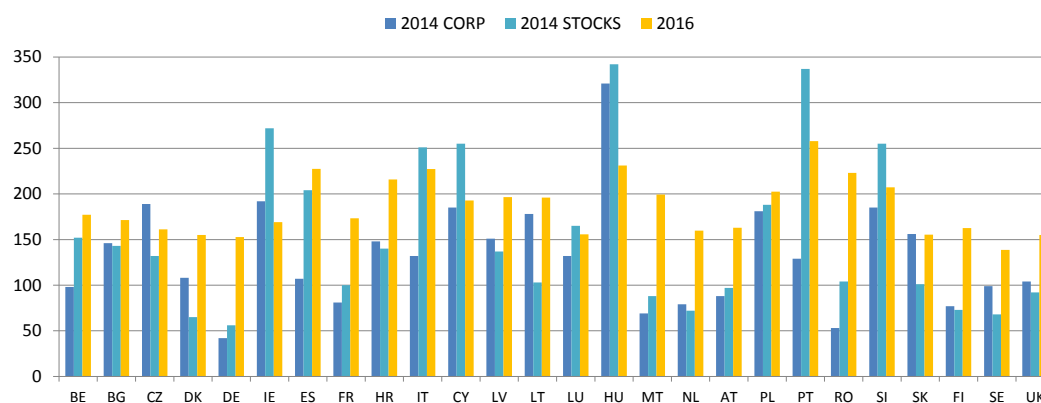
(basis points)

Notes: Data for Greece are not shown to improve the readability of the chart. Shocks to Greek sovereign spreads in the 2014 exercise were calibrated at about 300 basis points (2014 CORP) and about 650 basis points (2014 STOCKS). Shocks have not been calibrated for Estonia due to a lack of liquid sovereign debt instruments. Positive shocks mean that government bond yields increase relative to swap rates.

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[5] See:

https://eiopa.europa.eu/Publications/Surveys/Note_on_market_adverse_scenarios_for_the_core_module_in_the_2014_EIOPA_stress _test.pdf for more details.

Chart A2: Shocks to EU stock prices in the 2014 and 2016 EIOPA exercises
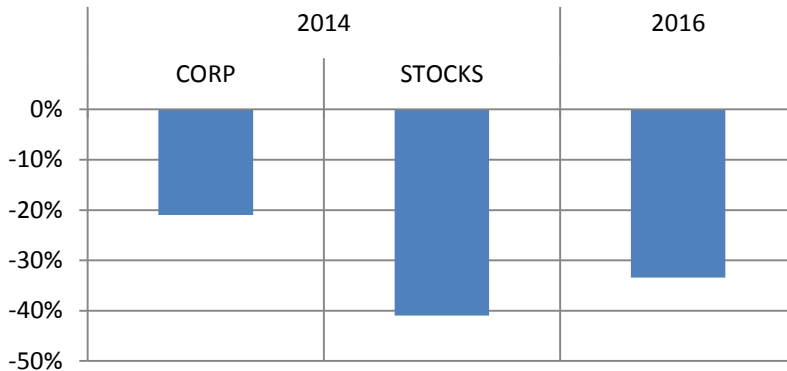
The shock to stock prices is slightly less severe than in the more demanding of the two scenarios used in the 2014 exercise (see 2014 STOCKS in Chart A2). This may be related to the extension of the historical data sample used for calibration of the 2016 scenario by two years, as stock market developments in 2014 and 2015 were relatively benign in comparison with the 2011-13 sample used to calibrate the 2014 scenarios.

Chart A3: Shocks to corporate bond spreads (over swap rates) in the 2014 and 2016 EIOPA exercises

(basis points)
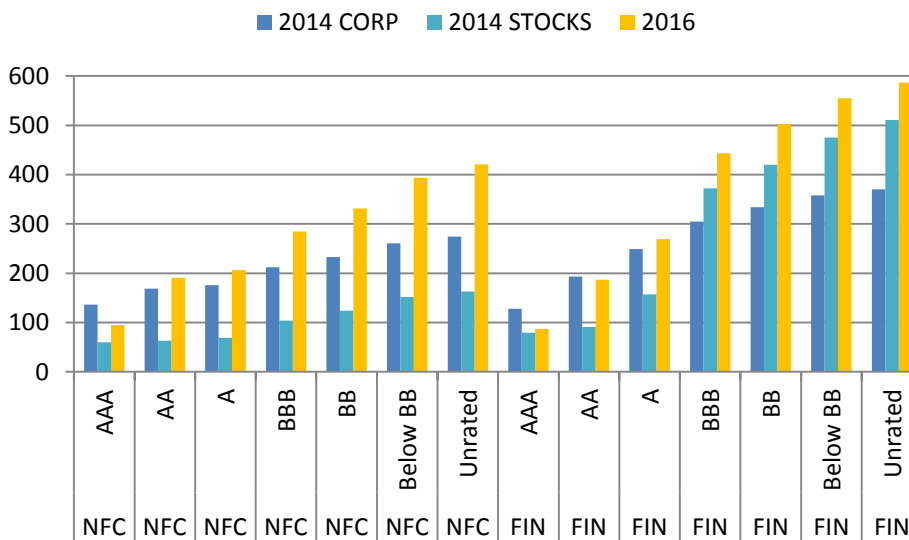
Note: A reference maturity of five years was assumed for corporate bonds.

Shocks to corporate bond spreads are generally more severe in the 2016 scenario, with the exception of AAA-rated corporate and bank issuers. However, as the number of such issuers is low, this exception does not have a material impact on the overall severity of the 2016 scenario. The spreads of non-investment grade and BBB-rated bonds are particularly strongly affected in the 2016 scenario.