EIOPA-FS-11/012

23 March 2011

Specifications for the 2011 EU-wide stress test in the insurance sector

1. Background

1.1. In the second-half of 2009 CEIOPS coordinated an EU wide stress-test which involved 28 major European insurance groups, including three larger Swiss insurers. The scope of the exercise was based on the List of 30 which had been previously agreed by CEIOPS Members. The stress test was conducted in accordance with the mandate received from the EFC-FSC with the aim of testing the resilience of the largest and important insurance groups to adverse capital market developments.

1.2. The exercise was launched in November 2009 and aggregated results were reported by the national regulators to the CEIOPS Secretariat in January 2010. Aggregated EU-wide results were reported back to EFC-FSC in March 2010 and high-level outcomes were disclosed to the public in the same month.

1.3. For future stress tests the EFC-FSC encouraged CEIOPS and CEBS in 2010 to coordinate the timing between the European banking and insurance stress tests.

1.4. The aim of this exercise is to receive information on the current vulnerability of the EU insurance sector to adverse developments. At this juncture, priority is given to learning about the economic effects over implementing a supervisory tool. This is why the cornerstones of this exercise are most current information (i.e. year end 2010 data), market valuation, distinct scenarios with rather different and also contradictory economic developments, and no reference to the current supervisory regime of Solvency I. Although not part of the current

supervisory toolkit, the insights gained through this stress test will be an input into the supervisory dialogue between colleges of supervisors/national supervisory authorities and participants, insofar as individual vulnerabilities appear too severe to tolerate. As the stress test is not a test of the current regulatory requirements (Solvency I), but uses prospective measures in Solvency II and as much as possible uses specifications laid out for the last available impact study, any results, even when published on an aggregate level, need to be interpreted with this qualification. As the stress test is not another QIS5 or a capital requirement and, at the same time, is based on a yet to be finalised future Solvency II regulation, the stress test will be conducted on a best effort basis and undertakings are able to use reasonable approximations, and proxies, where necessary.

1.5. In developing the stress scenarios due consideration was given to aligning the macro-economic assumptions with those applied to the stress test in the banking sector. However, the specificities of the insurance business needed to be reflected in the design of the EIOPA stress test.

2. EIOPA Regulation Requirements

2.1. The new EIOPA regulation which came into force on 1 January 2011 enables EIOPA to "*initiate and coordinate Union-wide stress tests in accordance with Article 32 to assess the resilience of financial institutions, in particular the systemic risk posed by financial institutions as referred to in Article 23, to adverse market developments, and evaluate the potential for systemic risk to increase in situations of stress, ensuring that a consistent methodology is applied at the national level to such tests and, where appropriate, address a recommendation to the competent authority to correct issues identified in the stress test." (Article 21 b)*

2.2. Furthermore Article 23 stipulates that "*the Authority 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.*

The Authority shall develop an adequate stress testing regime to help identify those financial institutions that may pose a systemic risk. These institutions shall be subject to strengthened supervision, and where necessary, to the recovery and resolution procedures referred to in Article 25."

2.3. In addition, Article 32 (2) states that "*the Authority 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, it shall develop the following, for application by the competent authorities:
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;"*

3. Objective of the 2011 exercise

Building on the experience of the 2009/10 exercise and taking into account new EU regulatory requirements, the aim of this exercise is to test whether the insurance sector in the European Union will be able to meet the minimum capital requirement even after applying well defined stress scenarios. The Solvency II capital requirements already are based on a certain level of prudence for similar risks. For example, groups and undertakings will be required to hold capital at a level so that they can absorb a significant decline in equity prices (based, as much as possible, on the QIS5-Technical Specifications, although reasonable approximations and proxies may be used, where necessary.

In addition to these asset-related stresses, this exercise includes insurance-related shock scenarios in order to test the resilience of the sector to catastrophic or severe insurance events.

This exercise should also be seen as a precursor for the development of a future comprehensive stress test framework in accordance with the EIOPA regulation.

4. Scope of the exercise

The aim of this exercise is to reach a market coverage rate of at least 50% based on statutory gross written premiums per country in EU/EEA member states, split between life and non-life. Similar to the previous stress test, the Swiss Financial Market Authority (Finma) has decided to join the Europe wide stress test.

Whilst the market coverage was calculated based on gross written premiums by solo undertakings, there is not necessarily a need for each undertaking identified by the national supervisors to carry out a separate stress test. The exercise should be conducted on the highest level of insurance consolidation within the European Union or EEA. This means that for the purpose of this exercise if these solo undertakings are part of groups which are participating in the stress test exercise, they do not have to submit individual stress test results

The stress test will thus include more than 200 insurers, including the largest European insurance groups.

5. Data collection and analysis

A best-effort principle applies to the 2011 stress test. This principle has been employed for all QIS exercises or any other ad-hoc data request from

EIOPA. However, given the significantly shorter time-frame set out for this stress test exercise compared to a full QIS exercise, a reasonable use of approximations and proxies is envisaged under this stress test.

In order to ensure consistency and a level playing field, EIOPA offers the possibility to address open issues in a Q&A procedure (st2011@eiopa.europa.eu). All participants should register to the related mailing list in order to receive updates on such Q&As. All questions and answers will be published on EIOPA's website.

The (lead) supervisors of the respective insurance groups and undertakings will be responsible for co-ordinating the exercise on all participating companies/groups subject to their supervision. EIOPA Members should ensure that results are submitted by the groups/undertakings in a timely manner and they should also validate individual results, in particular whether these are consistent with the previous assessments by national supervisors. Following the collection of data the lead supervisor/national authority is then expected to submit the anonymised data to EIOPA for processing the results.

An example of data to be submitted to EIOPA is shown in Annex 1. EIOPA will provide the lead supervisor/national authority with a basic Excel IT tool to facilitate the delivery of the data.

The information submitted from the lead supervisors/national authority to EIOPA should also include a qualitative assessment following the validation process.

Main data to be delivered to EIOPA:

(a) Change and ratio of own funds compared with the MCR per individual group[1]/undertaking.

(b) Change in own funds per individual group/undertaking.

(c) Percentage contribution of the individual shocks to the change in own funds per individual group/undertaking.

(d) It is assumed that the political bodies FSC and EFC will receive indicative and aggregated information at a European level, without any reference to individual Member States, insurance groups or undertakings.

National supervisors should report aggregated results split between groups and solo undertakings.

The calculation of the MCR (derived from the SCR) should also be performed on a best-effort basis, i.e. both SCR and MCR. In order to derive the MCR on a best effort basis participants may, in close co-

[1] For groups a best effort measure may be applied when assessing the Group SCR floor, e.g. this floor can be set by using the QIS5 2009 relationship between the floor and the Group SCR applied to the updated 2010 Group SCR. Alternatively a 45% SCR Group floor can be used (which is applied to solo undertakings) to derive a proxy for group MCR.

ordination with their relevant supervisor, include information based on QIS5, if appropriate.

6. Publication of results

EIOPA will publish the preliminary aggregated results of this exercise in early July. Due consideration will be given to the Solvency II-framework of this exercise, which will make interpretation of results an essential part of the analytical output.

This is why EIOPA sees no positive value in a possible publication of highly complex individual information, all the more so as the reference base – Solvency II specifications as in QIS5 – in itself might undergo changes while this exercise is performed and has indeed already been discussed in the preparation for the Solvency II implementing measures. This being said, EIOPA expects valuable insights into the risk position of participants for the market in aggregate and for the individual supervisor to be obtained, as this information is based on fair valuation. Further, this minimises possibly distorting effects of the Solvency I framework.

7. Timeline[2]

March 2011

- 23 March: Launch of exercise
- 28 March: Workshop with participating groups/undertakings

May 2011

- 31 May: Results to be reported to national/lead supervisors
- Validation of results by national/lead supervisors

June 2011

- 14 June: Results to be reported by national supervisors to EIOPA
- Analysis of results and preparation of aggregate report
- 30 June: Briefing to EIOPA Board of Supervisors and Communication

July 2011

- Presentation of results to EFC
- Presentation of results to ESRB
- Public presentation of aggregated results

[2] The timeline for the satellite scenario of the low interest rate scenario will start later and will be communicated in due course.

8. Reference date

The reference date for all scenarios is 31 December 2010. Participating groups and undertakings should update the QIS5 results, which were previously submitted to national supervisors, for year-end 2010 financials on a best effort basis. This includes updated discount rate curves to 2010 (both pre and post stress) following a methodology as much as possible similar to the one used under QIS5, but for simplicity for this exercise assuming no change in the liquidity premiums used, even though the illiquidity premium would in practice be expected to move in line with the market. A table is provided by EIOPA as a supplement to this specification.

Participating groups from Switzerland should follow full Swiss regulatory requirements (i.e. Swiss Solvency Test).

This stress test model assumes that in the baseline and adverse scenarios the capital market stresses occur instantaneously and simultaneously on the reference date. All other factors or assumptions remain unchanged in relation to the reference date.

In respect of management actions see section 16.

EIOPA's instant stress test model analyzes three "what-if-situations" or scenarios focusing on development on "market prices" on bonds, shares and technical provisions. An instant model just compares a "what-if-situation" with the 'present situation'. This what-if-situation / instant model does not have an explicit time horizon. The scenarios assume a simultaneous occurrence of the shocks for each capital market risk factor, so the risk correlation matrix for market and credit risks is assumed to be 1.

There will be only one set of insurance related stresses for life and non-life across the baseline, adverse and inflation scenarios. However, a correlation adjustment should be made with other risks following overall Solvency II factors (see section 17.6).

9. Consolidation

A world-wide consolidation for participating groups at the highest level of relevance for the group (including a holding company, if economically relevant) is required. Insurance groups should follow the consolidation principles as set out in the QIS5 Technical Specifications. For participating solo undertakings, their scope would encompass their activities as described below for groups and solo entities.

For simplicity reasons, only insurance activities and other non-banking participations are mandatory for inclusion in the exercise.

Consequently, banking activities are to be excluded from the scope of consolidation. If the banking activities are non-material to the group they can be included for simplicity. In case of exclusion from the scope of consolidation, the book value of banking participations should be deducted from the available capital. The value of non-controlled shareholdings in a non-insurance, non-banking subsidiary which is not subject to supervision

or capital requirements should be included in the equity stress calculation, (see also section 14 regarding indirect investments).

For the purpose of this stress test exercise the QIS5 option of applying local rules for third countries should be included when assessing MCR and available own funds.

10. Valuation Approach

The previous stress test exercise was based on Insurance Group Directive (IGD)/Solvency I valuation requirements. The limitations of this approach, in particular the non-comparable differences in valuation standards across Member states, were highlighted in the stress test results report to the EFC in March 2010.

In order to achieve better comparability and more realistic results, the 2011 stress test exercise will be based on future Solvency II principles. EIOPA acknowledges that there are shortcomings by referring to a framework which is seen as a testing environment and which is bound to change even whilst conducting this exercise. However, for the purpose of gaining realistic and consistent information, EIOPA considers QIS5 specifications as being the closest proxy to the framework that should be the background for a stress test. Although the QIS5 – Technical Specifications do not represent the final Solvency II requirements, the application, as much as possible of the most recent Quantitative Impact Study valuation and calculation guidelines overcomes some of the shortcomings of the first exercise. Conducting a stress test based as much as possible on QIS5 rules will better reflect the risk profile of insurance groups and insurance undertakings thus allowing for better comparability and understanding of outcomes. However, a reasonable use of approximations and proxies is expected, given the significantly shorter time-frame envisaged for this exercise compared to a QIS exercise. In order to ensure consistency and a level playing field, the principle of such shortcuts should be addressed within the public Q&A procedure.

Participating groups and undertakings should therefore as default and, on a best efforts basis, follow the valuation approach as set out in the QIS5 – Technical Specifications and the QIS5 Q&A document and which formed the basis for the EIOPA Report on the fifth Quantitative Impact Study (QIS5) for Solvency II. Swiss insurers should follow valuation requirements in accordance with the Swiss Solvency Test.

11. Stress Test Output

The aim of the stress test is to assess either the group solvency position or the solvency position of an individual undertaking, focusing on the level of own funds (i.e. available capital) before and after the stress test compared with the Minimum Capital Requirement (MCR) as a Solvency II measure. Swiss groups will be assessed based on Swiss Solvency Test requirements.

The direct output of the stress test will be the reduction in available own funds after stress test shocks (scenarios), i.e. own funds as of end-2010 minus the change in own funds after the scenario. This will be compared to the MCR. Participants may recalculate the MCR level after the shock in each scenario, as this would more appropriately represent their solvency position. However, for simplicity reasons, the pre-stress MCR will be the default numerator (i.e. in line with the best effort basis participants can opt for leaving the MCR unchanged post stress).

The output shall include some information on the contribution of the different shocks/risks to the change in own funds.

The Solvency II - MCR is used as a benchmark which is consistent with the aim of the stress test as it is deemed to be the ultimate intervention threshold for regulatory purposes whereas a breach of the SCR allows for a more flexible approach.

Swiss insurance groups should calculate their equivalent of the MCR (e.g. Threshold 3 in Circular 2008/44 SST).

EIOPA provides a stress test template in Excel format, comparable to QIS exercises, which will help to minimise misinterpretation of the framework and will produce the expected outcome in a way easily controllable by participants.

12. Loss-absorbing capacity

The loss-absorbing capacity of technical provisions and deferred taxes can be taken into account in line with the QIS5 – Technical Specifications (i.e. that participants exploit the means at their hands only within the current legal boundaries. See management actions in section 16)

For further details please see Section SCR 2 of the QIS5 Technical Specifications.

The loss absorbing capacity should be calculated on a best effort basis using one of the options outlined in the QIS5 Technical Specifications, but taking into account any legal requirements or restrictions regarding profit sharing and taxes.

13. Unit-linked business

In respect of unit-linked business, groups/undertakings should follow the approach as per the QIS5-Technical Specifications.

14. Indirect investments

The look through principle as set out in the QIS5-Technical Specification applies to indirect investments.

15. Hedging

Any existing hedging or other risk mitigations (e.g. derivatives and reinsurance) can be included in the stress testing, but only insofar as the hedging instruments have been in place at the reference date or if there is a contractual agreement with a counterparty that guarantees a downward protection if predefined capital market scenarios occur. This also includes dynamic hedging where appropriate. Where possible, groups/undertakings should report the impact of the hedging on the individual stress test results.

For the inclusion of potential management actions see section 16.

16. Management actions (post-stress)

In principle, stress test results should be calculated without taking into account risk mitigating actions (such as closing for new business) with the exception of items mentioned in section 12 (loss absorbing capacity).

However, groups or undertakings have the option to calculate stress test results without the impact of management actions (gross) and including the impact of management actions (net). If this option is exercised, both gross and net outcomes would need to be reported to the national supervisors. National supervisors will have to verify these management actions and provide an opinion whether the proposed actions are realistic.

For the purpose of considering management actions it is assumed that negative events occur six months prior to the reference date, so that groups and undertakings have time to initiate realistic actions. However, they should have due regard to the fact that during a period of crisis not all proposed initiatives would be successful (such as a fire sale of assets or the implementation of a new hedging programme).

17. Stress Test Scenarios

17.1. Introduction

This stress test framework comprises the following scenarios and modules:

For capital market and spread risks there are baseline and adverse scenarios. There is also an inflation scenario which assumes an increase in inflation and which forces central banks to rapidly increase interest rates.

In developing the scenarios due consideration was given to aligning the macroeconomic assumptions with those applied to the stress test in the banking sector, in particular the assumptions underlying the macroeconomic adverse scenario provided by ECB.

The stress test also contains a set of insurance-specific stresses which are to be applied across the baseline, adverse and inflation scenarios (see Annex 2).

All these stresses should be regarded as instantaneous shocks i.e. occurring on the reference date (see section 8 for further details).

Further to these stresses two satellite scenarios on long term low interest rates and sovereign risk are to be conducted (see sections 18 and 19 respectively).

17.2. Description of baseline, adverse and inflationary scenario

Three scenarios have been chosen. The actual shocks applied to different risk factors are intended to replicate a macroeconomic scenario and a what if situation. Whilst they might appear to be

remote; they are nonetheless realistic scenarios. The stress test operates with a baseline scenario, an adverse scenario and an inflationary scenario.

17.3. Interest rate, equity, property, spread risk parameters

17.3.1. Interest rate risk

The ECB macro economic assumptions for market risks in respect of the development of interest rates reflect an upward trend in the adverse scenario.

However, insurers are typically more affected by a decline in interest rates either because of embedded guarantees in life insurance contracts or because of lower investment returns in non-life. Consequently, the upward stress applied to banks will be used for the inflation scenario and the magnitude of this trend will be converted into a decline in the adverse scenario.

The floor of interest rate levels post the scenarios is zero.

17.3.2. Equity Risk

The ECB equity market assumptions in respect of the adverse scenario are very granular within the European Union.

In line with the current proposals under Solvency II and in order to facilitate the calculation of this stress module, a flat 15% decline for all equities in the adverse and 7.5% for the baseline scenario will be assumed by EIOPA.

17.3.3. Property risk

17.3.3.1.1. Residential property

In respect of property risk parameters the ECB has provided house price assumptions for 2011 and 2012 as a percentage deviation from the baseline scenario.

EIOPA has used the average percentage deviation for the two years 2011-2012 for the adverse scenario and the 2011 percentage deviation for the baseline scenario. It follows:

- Baseline scenario: 3.8%
- Adverse scenario: 11.6%

The stresses apply to all residential property world-wide.

17.3.3.1.2. Commercial property

Commercial property plays a significant role for insurers' investment strategy. Based on the information available[3] the following stresses apply:

- For all commercial property portfolios the decline in property prices during 2008 should be considered for the adverse scenario. Based on this, it assumes a 25% decline for the adverse scenario and a 12.5% decline in the baseline scenario (See table 1 in annex 2).

The stresses apply to all commercial property world-wide.

17.3.4. Spread risk

A 31.4% shock for investment grade bonds and a 38.3% shock for high yield bonds have been assumed. This has been converted from actual option adjusted spreads (based on Merrill Lynch Bond indices as of 31 December 2010) applying an additional increase to actual spreads for investment grade.

Change in Factors for corporate bonds and non-EU government bonds:

Ratings	Actual spreads	Increase of spreads (in percentage points) in the baseline scenario	Increase of spreads (in percentage points) in the adverse scenario
AAA	0.79%	0.125%	0.25%
AA	1.40%	0.22%	0.44%
A	1.87%	0.295%	0.59%
BBB	2.85%	0.445%	0.89%
BB	-	0.85%	1.70%
B or lower	-	1.50%	3.00%
Unrated	-	0.55%	1.10%

[3] UK IPD Index for commercial real estate

Change in Factors for AAA-rated covered bonds:

Ratings	Increase of spreads (in percentage points) in the baseline scenario	Increase of spreads (in percentage points) in the adverse scenario
AAA	0.10%	0.20%

Change in Factors for structured credit instruments:

Ratings	Increase of spreads (in percentage points) in the baseline scenario	Increase of spreads (in percentage points) in the adverse scenario
AAA	0.125%	0.25%
AA	0.22%	0.44%
A	0.295%	0.59%
BBB	0.445%	0.89%
BB	1.015%	2.03%
B or lower	1.69%	3.38%
Unrated	0.55%	1.10%

For deriving the adverse effect the same methodology as in the QIS5 Technical Specifications applies. The stresses should be applied to all debt instruments as specified in the aforementioned document.

17.4. Non-life insurance related stresses

Groups or undertakings should only report the greater of each the following two stresses.

The recovery or non-recovery from reinsurers refers only to external reinsurance arrangements. Intra-group reinsurance transactions can be ignored. For participating groups it is assumed that intra-group reinsurance has been eliminated as part of group consolidation.

17.4.1. Natural catastrophe event

Groups or undertakings should calculate the largest 1/200 natural catastrophe probable maximum loss (PML) (based on the most severe peril, e.g. flood, windstorm or earthquake.

The PML is to be calculated net of reinsurance and net of tax.

However, it is assumed that there is only a 70% recovery rate from reinsurers.

17.4.2. Claims reserves deficiency stress

Groups or undertakings should calculate a shortfall for all liability claims reserves (e.g. world-wide for groups).

This would be based on the assumptions of 2 percentage point higher claims inflation than presumed for existing best estimate calculations. For example, where non-life insurers assume that claims costs will increase by 2% p.a. due to the impact of inflation, they would have to add a further 2 percentage points (i.e. a total of 4%) for the post stress calculations.

The shortfall is to be calculated net of tax assuming that the tax burden would be reduced as a result of this event.

It is assumed that that the additional reserving due to higher claims inflation is not recoverable from (external) reinsurers.

17.5. Life insurance stresses

Groups or undertakings should only report the greater of each of the following two stresses.

The recovery or non-recovery from reinsurers refers only to external reinsurance arrangements. Intra-group reinsurance transactions can be ignored. For participating groups it is assumed that intra-group reinsurance has been eliminated as part of group consolidation.

17.5.1. Mortality event stress

Groups or undertakings should calculate the impact of a pandemic which leads to significantly higher mortality rates. The higher mortality is defined as 1.5 additional deaths per thousand lives. This stress test is based on a Swiss Re study[4] on the impact of a pandemic on life insurers where the above mentioned parameters was considered within the medium range of outcomes.

The impact is to be calculated net of tax and net of reinsurance.

However, it assumed that the recovery rate from the two largest reinsurers on the panel is only 50%. This higher non-recoverable rate (compared to the non-life catastrophic stress) reflects the higher concentration in the life reinsurance segment.

17.5.2. Longevity improvements

This stress test scenario takes into account the future developments of individual mortality rates and introduces a stress on the best estimate mortality the firm will assume, expressed as a percentage improvement.

[4] See Swiss Re study "Pandemic influenza: A 21st century model for mortality shocks (2007)

This stress is defined as 3 times the standard deviation of the compounded improvements in mortality since 1965 using the UK mortality table as a benchmark (see table 2 in Annex 2).

The below stress parameters measure the uncertainty of mortality improvements.

- Groups and undertakings should calculate the impact of an improvement in mortality rates.
- Based on the average compound improvements in mortality developments between 1965 – 2009 the following improvements rate of 23% for the total (i.e. for both male and female cohorts) of the immediate annuity portfolio (i.e. annuities in pay out) should be assumed. The impact is to be calculated net of tax.
- It is assumed that no reinsurance recovery is possible in respect of the additional reserving requirements.

17.6. Calculation of aggregated market stresses and insurance stresses

As pointed out in section 8, market and credit risk stresses should be calculated by assuming that all adverse developments occur instantaneously and simultaneously.

As regards the combination of the aforementioned stresses and the insurance stresses, participants should adjust the stress results for non-correlation.

The market risk and credit risk results should be aggregated. The outcomes of the non-life and life stresses should also be aggregated.. I.e. correlation structures in QIS 5 for SCR should not be applied directly to the stress outcome. However, the total results should be calculated by using a similar correlation approach as for the overall SCR calculation (see correlation matrix page 96 of QIS5 Technical Specifications).

j / ***i***	**Market and Credit**	**Life**	**Non-Life**
Market and Credit	1		
Life	0.25	1	
Non-Life	0.25	1	1

18. Long term low interest rates

A separate exercise in respect of the risks of a prolonged period of low interest rates is being developed.

This will be a satellite exercise to the 2011 EU-wide stress test in the insurance sector. During the consultation with industry bodies it was

agreed that the relevant specifications would be sent out and the results be collected at a later date.

19. Sovereign risk

The sovereign risk module for Europe is not part of the core stress test. However, results are to be calculated in a separate satellite exercise using granular assumptions (see Annex 3 and table 1). This calculation is to be compared with MCR (see principles in section 5).

The ECB macro economic assumptions assume an increase in government bond yields due to a widening of bond spreads. The parameters are provided for each member state of the European Union and apply to a satellite scenario. The increase is expressed as a deviation in basis points.

The increase in sovereign spreads is not assumed to have an impact of the discount rate curve (i.e. for this exercise no changes are foreseen in the valuation of the liabilities, except when the value of cash flows depend directly on the financial returns (e.g. profit sharing, financial guarantees)).

Annex 1 Example of data to be collected by EIOPA

EIOPA will provide a more detailed IT tool to lead supervisors to be used to provide the data to EIOPA.

Example:

As an example, consider a lead supervisor/national authority that collects the data of four insurance groups/undertakings as follows:

	Group/ undertaking AA	**Group/ undertaking BB**	**Group/ undertaking CC**	**Group/ undertaking DD**
(1) Available Own funds	2.7 bn	1.3 bn	2.1 bn	1.4 bn
(2) SCR	2.6 bn	1.1 bn	1.9 bn	1.2 bn
(3) MCR	0.9 bn	0.4 bn	0.8 bn	0.5 bn
(4)[5] Stress test result (Δ Own funds)	-1.1 bn	-0.2 bn	-0.3 bn	-0.2 bn
(5)[6] Δ MCR after adverse scenario	+/-0 bn	+/-0 bn	+/-0 bn	+/-0 bn
(6) Solvency ratio before adverse scenario (= (1) / (3))	300%	325%	263%	280%
(7) Solvency ratio after adverse scenario (= ((1) + (4)) / ((3) + (5)))	178%	275%	225%	240%
(8) Solvency deficit after adverse scenario	--	--	--	--
(9) Δ Own funds after adverse scenario due to interest rate shock	-0.3 bn	-0.05 bn	-0.1 bn	-0.1 bn
(10) Δ Own funds after adverse scenario due to equity shock	-0.2 bn	-0.05 bn	-0.1 bn	-0.15 bn
(11) Δ Available	-0.1 bn	-0.05 bn	-0.05 bn	-0.1 bn

[5] This result is computed from market and credit risk (∑[rows 9-12]), non-life risk (max[13,14]) and life risk (max[15,16]) using the correlation matrix in 17.6.

[6] If the participant opts to use the non-reduced MCR before stress, this line would contain no changes.

own funds after adverse scenario due to property shock				
(12) Δ Available own funds after adverse scenario due to spread shock	-0.1 bn	-0.1 bn	-0.1 bn	-0.1 bn
(13) Δ Available own funds after adverse scenario due to non-life insurance related shock (nat. cat)	-0.1 bn	-0.05 bn	-0.05 bn	-0.2 bn
(14) Δ Available own funds after adverse scenario due to non-life insurance related shock (claims)	-0.2 bn	-0.3 bn	-0.1 bn	-0.1 bn
(15) Δ Available own funds after adverse scenario due to life insurance related shock (mortality)	-0.4 bn	+/-0 bn	-0.05 bn	+/-0 bn
(16) Δ Available own funds after adverse scenario due to life insurance related shock (longevity)	-0.1 bn	+/-0 bn	-0.2 bn	+/-0 bn
Management action				

Anonymised reporting to a centralised database run by EIOPA per member would look as follows:

Lead supervisor	Country XY
Participating groups	4
Participating solo insurers	0
Aggregated available own funds	7.5 bn
Aggregated SCR	6.8 bn
Aggregated MCR	2.6 bn
Aggregated Δ available own funds after adverse	-1.8 bn

scenario	
Aggregated solvency deficit after adverse scenario (for those groups with a solvency deficit)	0.0 bn
Aggregated solvency deficit after adverse scenario (for those solo insurers with a solvency deficit)	0.0 bn

RANDOMLY SHUFFLED RATIOS (each line is separately shuffled)

Solvency ratio before scenarios	325%	263%	300%	280%
Solvency ratio after adverse scenario	275%	178%	225%	240%
Contribution of interest rate shock to overall Δ available own funds after adverse scenario	25%	27%	33%	50%
Contribution of equity shock to overall Δ available own funds after adverse scenario	18%	33%	75%	25%
Contribution of property shock to overall Δ available own funds after adverse scenario	9%	17%	25%	50%
Contribution of spread shock to overall Δ available own funds after adverse scenario	50%	50%	33%	9%
Contribution of non-life insurance related shock (nat. cat) to overall Δ available own funds after adverse scenario	9%	100%	25%	17%
Contribution of non-life insurance related shock due to claims to overall Δ available own funds after adverse scenario	18%	33%	50%	150%
Contribution of non-life insurance related shock due to mortality to overall Δ available own funds after adverse scenario	0%	0%	17%	36%
Contribution of non-life insurance related shock due to longevity l to overall Δ available own funds after	67%	0%	0%	9%

adverse scenario				

Similar tables for both baseline and inflation scenario.

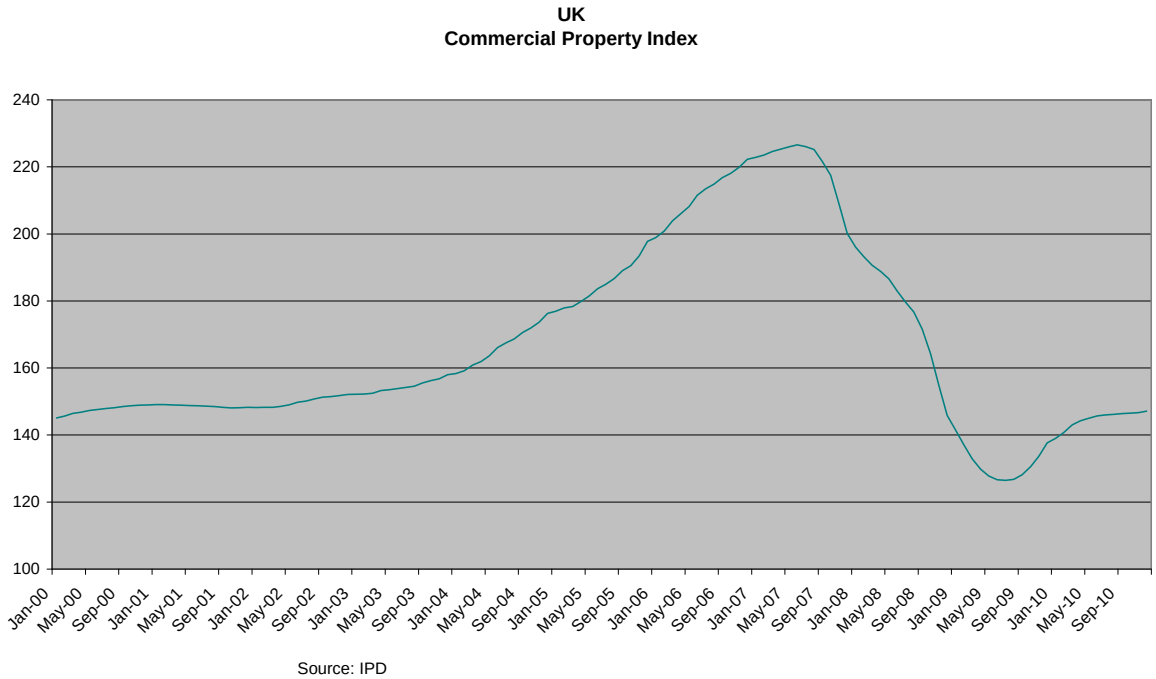
Annex 2

Summary of scenario assumptions

Risk modules		Baseline scenario	Adverse scenario	Inflation scenario
Market Risk				
Interest rate	0- 3M	-40 bps	-125 bps	+125 bps
	3M+	-20 bps	-62.5 bps	+62.5 bps
Equities		-7.5%	-15%	0%
Real estate Residential		-3.8%	-11.6%	0%
Real Estate Commercial		-12.5%	-25%	0%
Credit Risk				
Spread risk				
Investment grade		+15.7% increase in spreads	+31.4% increase in spreads	0%
High-yield		+19.15% increase in spreads	+38.3% increase in spreads	0%
Insurance risks				
Non-life Insurance related stresses		MAX [Nat. Cat.; Claims inflation] (see 17.4)		
Life Insurance related stresses		MAX [Mortality; Longevity] (see 17.5)		

Table 1 (UK IPD Commercial Property index) Base year 1987

31/12/2007	200.08762
31/01/2008	196.04143
29/02/2008	193.11896
31/03/2008	190.6156
30/04/2008	188.8008
30/05/2008	186.59393
30/06/2008	182.8933
31/07/2008	179.59669
29/08/2008	176.65472
30/09/2008	171.51501
31/10/2008	164.15515
28/11/2008	154.85162
31/12/2008	145.80977
30/01/2009	141.42688
27/02/2009	137.06471
31/03/2009	132.83481
30/04/2009	129.77034
29/05/2009	127.7399
30/06/2009	126.61912
31/07/2009	126.45647
31/08/2009	126.72383
30/09/2009	128.15916
30/10/2009	130.53827
30/11/2009	133.61293
31/12/2009	137.63043
29/01/2010	138.9827
26/02/2010	140.75037
31/03/2010	142.98921
30/04/2010	144.20108



Source: IPD

Table 2 a-c UK mortality improvement - Illustrative calculation

Table 2 a – Mortality age group 65

Mortality Data Set

	Q_{65}	q_{66}	q_{67}	q_{68}	q_{69}	q_{70}	q_{71}	q_{72}	q_{73}
2000	0.01828	0.02022	0.02233	0.02491	0.02781	0.03046	0.03382	0.03787	0.04256
2001	0.01732	0.01928	0.02144	0.02304	0.02632	0.02948	0.03254	0.03624	0.04002
2002	0.01712	0.01857	0.02093	0.02282	0.02576	0.02777	0.03223	0.03521	0.03859
2003	0.0166	0.0183	0.02043	0.0228	0.02505	0.02679	0.03066	0.0339	0.03821
2004	0.01614	0.01792	0.01934	0.02112	0.02383	0.02608	0.02864	0.03251	0.03551
2005	0.01561	0.01683	0.01913	0.02053	0.02223	0.02474	0.0285	0.03084	0.03407
2006	0.0149	0.01669	0.01824	0.02015	0.02133	0.02399	0.02674	0.02942	0.03212
2007	0.01498	0.01597	0.01762	0.01984	0.02163	0.02288	0.02546	0.02874	0.03098
2008	0.01461	0.01583	0.01682	0.01965	0.02139	0.02329	0.02541	0.02791	0.03151
2009	0.01357	0.01527	0.01649	0.01828	0.02051	0.02168	0.02424	0.02703	0.02952

Table 2 a is for illustrative purposes only.

Table 2 b

Compound Improvement in Mortality

	65	66	67	68	69	70	71	72	73
2000	-	-	-	-	-	-	-	-	-
2001	0.05252	-	-	-	-	-	-	-	-
2002	0.01155	0.08160	-	-	-	-	-	-	-
2003	0.03037	0.05083	0.08509	-	-	-	-	-	-
2004	0.02771	0.03500	0.09795	0.15215	-	-	-	-	-
2005	0.03284	0.08033	0.08600	0.10894	0.20065	-	-	-	-
2006	0.04548	0.06864	0.10720	0.11700	0.18959	0.21241	-	-	-
2007	-0.00537	0.05110	0.08893	0.12982	0.16033	0.22388	0.24719	-	-
2008	0.02470	0.05153	0.12075	0.06960	0.14611	0.16133	0.21911	0.26301	-
2009	0.07118	0.04383	0.09594	0.10960	0.13932	0.19074	0.24791	0.25414	0.30639

The above table shows the compounded improvement in mortality for age group 65 and is calculated based on the below formula:

1-(mortality in the corresponding highlighted cell for each age / mortality in year 2000)

e.g. From Table One:
Use factor q65 year 2001; divide by q65 year 2000:
Age 65 = 1 - (0.01732/0.01828) continue
Age 66 = 1- (0.01857/0.02022) ….

Table 2 c – Standard deviation results

Age	65	66	67	68	69	70	71	72	73
Standard Deviation	0.02244	0.01707	0.01289	0.02731	0.02688	0.02752	0.01642	0.00627	-
3 x Standard Deviation	0.06731	0.05120	0.03867	0.08193	0.08063	0.08256	0.04926	0.01881	-

Annex 3 – Sovereign risk scenario

Risk module	Baseline scenario	Adverse scenario	Inflation scenario
Sovereign Risk			
Increased spread of government debt	None	See table 1 below	

Table 1

Basis point increase in yields[7]:

Belgium	78.0
Bulgaria	81.0
Czech Republic	34.5
Denmark	16.5
Germany	0.0
Estonia	39.0
Ireland	258.0
Greece	255.0
Spain	165.0
France	48.0
Italy	136.5
Cyprus	136.5
Latvia	55.5
Lithuania	64.5
Luxemburg	78.0
Hungary	114.0
Malta	136.5
Netherlands	22.5
Austria	24.0
Poland	67.5
Portugal	246.0
Romania	91.5
Slovenia	39.0

[7] Envisaged sovereign risk for EU countries are ECB macroeconomic assumptions (see section 18) whereas EEA countries are assumptions similar to the EBA market risk test for long term maturities.

Slovakia	33.0
Finland	10.5
Sweden	6.0
United Kingdom	28.5
Iceland	42.0
Liechtenstein	0.0
Norway	6.0
Switzerland	0.0