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Calibration of the standard formula spread risk module
Note to the Commission for insertion in the draft QIS5 Technical Specifications

Purpose and content of this note

The calibration was carried out on the basis of a revised design for the spread risk module which was necessary to ensure that the additional risk due to an inclusion of an illiquidity premium in the discounting of technical provisions is reflected in the SCR standard formula calculation.
This note provides further background on the recalibration of the spread risk factors carried out by FinReq, sets out the new factors and compares them to previous calibrations. This is supplemented by an estimation of the impact of the new factors on the level of capital requirements.

Background

Following guidance from the European Commission, FinReq has amended the design and calibration of the spread risk module in the SCR standard formula to be compatible with the inclusion of an illiquidity premium in the risk-free interest rate curve used for the calculation of technical provisions.

This work was carried out on basis of the recommendations to adjust the SCR standard formula for allowing an illiquidity premium as contained in the "Task Force Report on the Liquidity Premium". The approach taken by FinReq to amend the spread risk module is also described in a recent CRO Paper on the calibration of market risks in the standard formula.[1] The approach involves a recalibration of the spread risk factors, as well as structural design changes. The approach taken follows closely the recommendations of the Task Force[2] for amending the spread risk module. A detailed description of this work is provided in the annex.

The proposal has been submitted for approval to CEIOPS Members following the March 2010 Members Meeting. Four Member States objected to the proposed recalibration. The objections are linked to the scope and size of the il-

[1] See option 2 in section 3 of the CRO Forum paper "Calibration recommendation for the market risks in the Solvency II standard formula", which is described in the paper as the "more theoretically sound approach".
[2] see section I.6 of the Illiquidity Premium Task Force report

liquidity premium and reservations have been expressed as to the indiscriminate increase of the spread risk factors for all types of business, irrespective of whether the illiquidity premium would apply to such business. The impact of such recalibration on the overall SCR would therefore remain unclear. It was also suggested to underline that the calibration should be subject to periodical review.

Based on the outcome of the approval procedure, at this stage CEIOPS has not reached a consensus on this issue. Therefore, the Commission should consider this as a **majority view of CEIOPS**.

Proposal (to be inserted in paragraph SCR.5.115 of the CEIOPS draft QIS5 Technical Specifications sent to the Commission on 31 March 2010)

To determine the spread risk capital charge for bonds, the following factors F^{up} and F^{down} are proposed:

Proposed spread risk factors for bonds

	F^{up}	F^{down}	Duration Floor	Duration Cap
AAA	**1,0%**	**-0,4%**	1	--
AA	**1,5%**	**-1,0%**	1	--
A	**2,6%**	**-1,7%**	1	--
BBB	**4,5%**	**-3,0%**	1	7
BB	**8,4%**	**-6,3%**	1	5
B or lower	**16,2%**	**-8,6%**	1	3,5
Unrated	**5,0%**	**-3,3%**	1	7

The factors F^{up} are applied to assess the impact of a widening of spreads on the value of bonds, whereas the factors F^{down} are applied to assess the impact of a tightening of spreads on the value of bonds. For example, for a AAA-rated bond with a duration of 5 years a loss in value of 5% would be assumed under the widening of spreads scenario.[3]

Comparison to previous calibrations

In the following the proposed factors are compared to previous calibrations, namely the calibration of the spread risk factors as part of CEIOPS' Level 2 advice on the calibration of the market risk module in the standard formula (published in January 2010), and the calibration of the spread risk factors in

[3] For further technical information on the specification of the capital risk charge for spread risk we refer to paras. 5.89 ff in CEIOPS' proposal for the QIS5 Technical Specifications.

the pre-consultation version of this advice (CP 70, published in November 2009).

It should be noted that the calibration of the spread risk factors in CEIOPS' Level 2 advice was carried out on basis of spreads of credit default swaps (CDS). In contrast, under the new proposal the factors are calibrated on basis of "full" spreads of bonds over and above the risk-free rates. These "full" spreads can broadly be decomposed into a spread component related to CDS spreads and an additional liquidity component. The calibration based on CDS spreads implicitly assumed that all spreads have an illiquidity premium, and that credit for illiquidity premium can be taken on the asset side for all bonds (and therefore all products). However, an explicit allowance on the liability side for illiquidity premium for just some products was recommended by the Task Force. This highlighted that to make an allowance on the asset side by calibrating to CDS spreads would be inappropriate (because CDS's strip out illiquidity premium, and this is already taken into account in the liability discount rate), and so the calibration now needs to be based on "full" spreads.. The calibration of the spread risk factors in CP 70 had also been based on "full" spreads.

The risks inherent in a potential change in "full" spreads comprise both the risk of a change in "pure credit" spreads (close to CDS spreads) and also the risk inherent in the liquidity component. Due to this additional risk related to the liquidity component, factors calibrated on basis of "full" spreads will generally be higher than factors calibrated on basis of CDS spreads only.

The following table provides a summary comparison of the factors:

	Proposed QIS5 calibration - based on full spreads -			**CP 70 pre-consultation -based on full spreads-**	**Level 2 Advice - based on CDS -**
	F_up	**Duration Floor**	**Duration Cap**	**F[4]**	**F**
AAA	1,0%	1	--	1,8%	1,3%
AA	1,5%	1	--	2,4%	1,5%
A	2,6%	1	--	3,6%	1,8%
BBB	4,5%	1	7	4,1%	2,5%
BB	8,4%	1	5	7,4%	4,5%
B or lower	16,2%	1	3,5	7,4%	7,5%
Unrated	5,0%	1	7	4,2%	3,0%

We note the following in regard to this comparison:

- For very highly rated bonds (AAA and AA), the liquidity component in the spread presents only a very small risk, hence calibrating the factors on basis of "full" spreads rather than only CDS spreads presents

[4] based on 0-2.9Y maturity bucket, divided by the average observed duration in this bucket (1.9)

little additional risks. This explains why the new factors are broadly comparable to the Level 2 advice factors for these classes.

- The differences to CP 70 for these high rating categories are due to a change in the choice of the underlying indices and an improved overall methodology to derive the factors as compared to the CP 70 calibration method.
- For lower rating classes, as explained above the new factors are higher than the Level 2 advice factors and broadly at the level of the CP 70 factors (with the exception of the B rating category which was not calibrated as a separate category in CP 70, but together with BB).
- For the A rating category, following the tentative working assumptions on the quantification of a liquidity premium as proposed by the CRO Forum, we could expect that a risk factor based on "full" spreads would roughly be twice a high as a risk factor based only on CDS spreads. This relation can indeed be observed as between the Level 2 factor and the CP 70 factor; the new proposed factor of 2.6% for this rating class is even lower.

Impact assessment

To estimate the impact of the new proposed factors, the following table compares the overall capital charges induced by the factors on a benchmark portfolio of bonds which was based on QIS4 data. This comparison also includes the spread risk factors proposed by CRO Forum.

Impact of factors on QIS4 benchmark portfolio

	Assumptions			Capital charges			
	Share in portfolio	**Median duration**	**Assumed maturity (~duration + 20%)**	**Proposed QIS5**	**CP 70**	**Level 2 Advice**	**CROF Proposal (option 2)**
AAA	37,8%	4,4	5,3	1,7%	3,0%	2,2%	2,0%
AA	27,4%	4,3	5,2	1,8%	2,8%	1,8%	1,6%
A	22,2%	4,0	4,8	2,3%	2,6%	1,6%	1,7%
BBB	6,7%	4,0	4,8	1,2%	1,0%	0,7%	0,8%
BB	0,8%	3,7	4,4	0,2%	0,2%	0,1%	?
B or lower	0,6%	3,4	4,1	0,3%	0,2%	0,2%	?
Unrated	4,6%	3,0	3,6	0,7%	0,7%	0,4%	?
			SUM	**8,2%**	**10,4%**	**6,9%**	**min. 6,1%**

This shows that on basis of the benchmark portfolio the new factors would lead to an overall capital charge of 8.2% (in relation to the credit risk exposure of the bond portfolio as a whole), which is between the charge resulting from the CP 70 factors (10.4%) and the charges induced by the Level 2 factors (6.9%).

We note, however, that the following caveats apply to this assessment:

- Since end 2007 (reference date used in QIS4), ratings have migrated downwards, so the difference as compared to the factors from the Level 2 Advice might be greater at year end 2009 (which will be used as the reference date in QIS5). Note that the Impact Assessment included in the impact assessment paper does make some allowance for these rating migrations.

- The assessment above does not include consideration of the effect of the illiquidity premium on liabilities or the tightening of spreads scenario.

Annex – description of re-design of the spread risk module

The design of the spread risk module in the SCR standard formula relies on a formulaic approach which uses the credit risk exposure of the asset instrument in question as a volume measure, and takes into account the credit rating of the instrument and its duration in the applied factor. In its current design the spread risk module is focused on the asset side and is constructed as a one-sided risk (i.e. only a potential widening of spreads is considered).[5] The capital charge for spread risk is computed separately for bonds, structured credit products, credit derivatives and mortgage loans.

To allow for the recognition of a liquidity premium (even where liquidity premium is effectively measured at nil on the financial markets), FinReq has amended the design and calibration of the spread risk module such that:

- The module captures spread risk as a two-sided risk; and
- The module recognises the impact of a change in the illiquidity component of the spread not only on the asset but also on the insurance liability side.

To achieve this, the following three steps were taken:

- **Step 1**: the spread risk factors were recalibrated on basis of "full spreads" rather than only CDS spreads
- **Step 2**: an additional set of spread risk factors was calibrated to capture a potential tightening of spreads (so that spread risk becomes a two-sided risk)
- **Step 3**: an additional component was added to the formulae to also measure the effect of the spread risk scenarios on the liability side

With respect to step 1, we note that a recalibration of the factors to "full" spreads of bonds or other instruments over and above the risk-free rate was necessary to achieve a consistent measurement of the risk related to a "liquidity premium" on both the asset and liability side.

In the calibration of the spread risk module proposed for the final advice in January the factors were based on CDS spreads rather than "full" spreads following suggestions from the industry in the consultation.

[5] With the exception of structured credit products, where both a widening and a tightening of spreads is prescribed.