

Solvency Consulting Knowledge Series

## SOLVENCY II AND REINSURER RATINGS

Having a business partner with financial strength is becoming more important

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### Executive summary

The fifth quantitative impact study (QIS5) is likely to be the last official test of the current design and calibration of the standard formula across the whole of Europe.

There have been some changes to Solvency II's standard approach from the technical specifications for QIS4 – due in no small part to the financial crisis – and the standard formula for measuring counterparty default risks tested in QIS4 is again the subject of debate, as the study produced results that were not plausible. The use of rating information to determine default probability has also been questioned. Though there is some uncertainty on various aspects, there appears to be no alternative at present.

In any event, under Solvency II companies will need to take greater care in selecting their business partners.

### Determining counterparty default risk on the basis of rating information

We have been aware for some time of the changes that Solvency II is likely to introduce. The amount of capital supervisory authorities will require insurers to hold will depend on the amount and quality of the risks they have assumed, and under Solvency II these will include the risk of a reinsurer defaulting. In most

countries, this risk has so far had no effect on the capital requirement. However, there has been no uniform regulation applicable to the whole of Europe.

Under Solvency II, the counterparty default risk on a reinsurer is the risk of a reinsurance partner no longer being able to meet its payment obligations in full. The calculation of the capital requirement for this risk is to take account of credit rating provided that the reinsurer has a credit rating issued by a rating agency. CEIOPS has questioned the wisdom of this procedure, as the financial crisis has demonstrated that credit risk has in the past been generally underestimated<sup>1</sup>. However, this was not the only reason for again fundamentally calling into question the method of determination of counterparty default risk under Solvency II. Under QIS4, the capital requirement for counterparty default risk was the lowest produced by the three basic risk modules – underwriting risks, market risks and counterparty default risks.

The QIS4 participants have questioned the standard formula, in particular its high degree of complexity. Under QIS4, companies had to determine risk capital separately for each individual reinsurer. To do this, it was necessary to calculate the market value of the loss that would arise on default by the reinsurer together with the associated probability of default.

<sup>1</sup> CEIOPS 2009: "Lessons learned from the crisis (Solvency II and beyond)"

The probability of default was based on information from rating agencies. The Vasicek-Herfindahl approach was used to determine the risk factors. However, the ratio used for the diversification effect and the number of counterparties did not appropriately reflect the actual risk. There is some doubt as to whether the QIS5 calculation will really be less complex. It is necessary to calculate a variance derived from parameters to be determined for each rating class.

Against the background of the current situation in the financial markets, CEIOPS has been examining how much reliance can be placed on information from rating agencies. It is questionable, for example, whether rating information is sufficiently independent of companies and hence uninfluenced by conflicts of interest. Whether the methods used by rating agencies are appropriate and sufficiently transparent is also open to doubt and the speed at which they react to changes in creditworthiness is perceived as a problem.

Despite these criticisms, there is currently no real alternative way of determining probability of default. The solvency ratio is only used for business partners with no rating. There has been no change in the parameters applied to determine default probability for companies rated BB and higher since QIS4, though capital requirements are not the same due to the new method of calculation.

### What impact does this have on an insurer's risk management?

Many insurers do not wish to wait until all of the implementing measures are finally established and are therefore already involved in intensive preparations for Solvency II. Key issues include preparations for the ORSA process (Own Risk and Solvency Assessment) and hence the production of a risk strategy, which must incorporate considerations on

risk-sharing instruments that the company might use in the future. The default probabilities for such instruments will play an important role, as they will determine the risk capital requirement under the standard formula (counterparty default risk module). The effect of changes in business partners' creditworthiness on a company's own risk situation will also have to be assessed.

Under Solvency II, the choice of risk-sharing instrument and the financial strength of the business partner will have a considerable effect on the capital requirement.

To calculate the market value of the loss given default (LGD), different recovery rates are used for the various risk-sharing instruments. The recovery rates take account of the fact that, if the counterparty in a risk-sharing instrument defaults, a portion of the insurance obligations will still be satisfied. For reinsurance for example, it is assumed that even following a default 50% of the LGD will be paid, so that only a half of the amount is included in the calculation of risk capital. For derivatives however, it is assumed that only 10% of a counterparty's commitments will be covered in the event of default, so that risk capital must be calculated for 90% of the LGD.

The rating determines the default probability, which is the prime factor in determining both the risk capital used in the SCR calculation and the adjustment factor for the reinsurance recoverables on the assets side of the economic solvency balance sheet. Thus, a lower rating increases the adjustment factor, reducing the assets, whilst the risk margin on the liabilities side rises, leading to a fall in the economic capital.

The way in which the capital requirement reacts to a change in the financial strength of a reinsurer is illustrated by the three scenarios in the example below. The calculations are based on the technical specifications for QIS5.<sup>2</sup>

The example is based on the data of a medium-sized European non-life insurance company with capitalisation in line with the European market average. The company's core business is highly exposed to natural hazards, particularly storm scenarios.

It transfers the greater part of its underwriting risks to several reinsurers, 50% of which have an AA credit rating, the remaining 50% being rated A. For simplicity, the reinsurers have been divided into two groups corresponding to these ratings.

The market value of a loss on default of a reinsurer *i* can be derived from the relevant reinsurance recoverables. The amount of the reinsurance recoverables depends on the type of reinsurance cover. They are generally higher for proportional reinsurance contracts, such as quota share treaties. For non-proportional treaties, such as stop-loss reinsurance, the reinsurance recoverables are usually lower than for proportional treaties that have the same effect on risk capital.

The reinsurance recoverables should be increased by the amount of the risk-mitigation effect no longer achievable due to a default, which equates to the difference between the hypothetical (gross) and the actual (net) capital requirement produced by the underwriting risk module. The hypothetical capital requirement is the capital that would be required according to the relevant risk module were no risk-sharing instruments in place. The actual net capital requirement takes the effect of risk-sharing instruments into account. Receivables covered by collateral should be regarded.

<sup>2</sup> European Commission: QIS5 Technical Specifications dated 5 July 2010.

In principle, the valuation must be performed for each reinsurer  $i$ . In line with the principle of proportionality, companies may also perform the calculation by rating group  $j$ , so that the LGD for a reinsurer can be more simply expressed as follows:

$$LGD_j = \max[50\% \cdot (RI \text{ recoverable}_j + SCR_{j \text{ gross}} - SCR_{j \text{ net}} - \text{Collateral}_j); 0]$$

where  $j = 1, \dots, m$  ( $m$  is the number of rating groups selected)<sup>3</sup>

The probability of default – in this case for simplicity by rating group – must also be established for the calculation of the capital requirement.<sup>4</sup> The grouping of a number of reinsurers in a group is basically conservative, in particular as diversification effects within a group are disregarded. If two reinsurer groups are compiled, CEIOPS suggests using the following risk factors to determine the capital requirement for the counterparty default risk:

The matrix contains the risk factors for two separate rating groups. In the example, the risk factor to be applied is 4.06%. If the rating of the group with an A rating deteriorates to BBB, the risk factor rises to 7.72%.

Diversification effects within a rating group are disregarded. Using the factor approach, therefore, the capital requirement for each rating group is calculated as follows:

$$SCR_{\text{def},j} = LGD_j \cdot \text{riskfactor}_j$$

The capital requirement for the counterparty default risk is then aggregated across all rating groups taking diversification into account.

**Table 1**

	AAA	AA	A	BBB	BB	B	CCC
AAA	1.12%						
AA	1.82%	2.51%					
A	3.52%	4.06%	5.61%				
BBB	7.42%	7.72%	8.94%	12.28%			
BB	27.28%	27.51%	28.63%	32.99%	45.50%		
B	50.04%	50.16%	50.78%	53.55%	64.27%	83.37%	
CCC	50.04%	50.16%	50.78%	53.55%	64.27%	83.37%	83.37%

<sup>3</sup> The factor of 50% (recovery rate) assumes that the defaulting reinsurer will still be able to meet a part of its insurance obligations.

<sup>4</sup> The highest rating in the group is taken as the probability of default for a rating group. Cf. Technical Specification SCR.6.57.

The company's starting position is its economic balance sheet as at 31 December:

**Table 2 Economic balance sheet** (starting situation)

Assets (€m)		Liabilities (€m)	
Investments	37.0	Economic capital	16.9
Ceded share of technical provisions	20.5	Gross best estimate	21.5
Other assets	21.0	Risk margin	1.1
<b>Total assets</b>	<b>78.5</b>	Other liabilities	39.0
		<b>Total liabilities</b>	<b>78.5</b>

Assets total €78.5m. The technical provisions (best estimate in the economic balance sheet) equate to the amount expected to be needed to settle claims plus the risk margin, which, in simple terms, is intended to represent the capital costs of non-hedgeable risks. For simplicity, in the example the company posts reserves of €21.5m in the year of occurrence of the loss, reflecting the claims expected to be paid out in the following year. The technical provisions include a risk margin of 5%. Since the insurer transfers a large proportion of its risks, the reinsurer's share of the technical provisions is correspondingly high. The provisions also take account of the counterparty default risk on the expected reinsurance recoverables.<sup>5</sup> The company's economic capital in the starting year is €16.9m. It must check whether its capital is sufficient to meet the regulatory requirements from a solvency point of view.

In order to assess the effect of a change in the credit standing of a reinsurer on an insurer's risk situation, three scenarios are considered below:

1. **Scenario 1** is based on the assumption that major catastrophe events do not occur. The insurer's results are good.
2. **In Scenario 2** the insurer is affected by a catastrophe event.
3. **Scenario 3** assumes that, in addition to the catastrophe event, one of its reinsurer rating groups is downgraded from the third-highest category A to BBB, so that 50% of the reinsurers are still rated AA and the remaining 50% BBB.

As a first step, the effects of each scenario on the following year's economic balance sheet are considered. The second step is then to compare the capital requirements with the economic capital.

<sup>5</sup> For simplicity, the example uses the simplified formula from QIS5. Cf. European Commission: QIS5 Technical Specifications dated 5 July 2010, TP 2.160.

**Table 3 Economic balance sheet (Scenario 1)**

Assets (€m)		Liabilities (€m)	
Investments	39	Economic capital	20
Ceded share of technical provisions	6	Gross best estimate	7
Other assets	21	Risk margin	0
<b>Total assets</b>	<b>66</b>	<b>Total liabilities</b>	<b>66</b>

**Table 4 Economic balance sheet (Scenarios 2/3)**

Assets (€m)		Liabilities (€m)	
Investments	39	Economic capital	10
Ceded share of technical provisions	194	Gross best estimate	195
Other assets	21	Risk margin	10
<b>Total assets</b>	<b>254</b>	<b>Total liabilities</b>	<b>254</b>

**Table 5 Determining the default risk for reinsurance recoverables**

	Exposure on default by reinsurers (€m)	Reinsurers' ratings	Default risk (€m)
Starting situation	10.2	AA/A	0.4
Scenario 1	2.9	AA/A	0.1
Scenario 2	97.0	AA/A	4.0
Scenario 3	97.0	AA/BBB	7.5

**Table 6 Comparison of capital requirements for counterparty default risk with economic capital**

	Default risk (€m)	Economic capital (€m)
Starting situation	0.4	17
Scenario 1	0.1	20
Scenario 2	4.0	10
Scenario 3	7.5	10

## Step I

### Scenario 1

As assumed, the claims from the previous year are paid. The insurance industry has had a quiet year for catastrophe risks. This is reflected in the reduced technical provisions on the liabilities side and share ceded to reinsurers on the assets side. Economic capital rises to €20m.

### Scenarios 2 and 3

A catastrophe event occurred during the year and the insurance industry must create sufficient reserves to cover it. The technical provisions on the liabilities side rise by over €182m to €205m, which includes a risk margin of 5% (around €10m). The ceded share of the technical provisions on the assets side is determined by the treaty conditions. In both scenarios, economic capital falls to €10m.

The deterioration in the reinsurers' credit standing additionally assumed for Scenario 3 is primarily reflected in the capital requirements. A deterioration in credit standing also triggers an adjustment/reduction of the reinsurance receivables on the assets side in the amount of the expected counterparty default risk. This, together with a rise in the risk margin in the Solvency II balance sheet, results in a reduction in capital. We will not go into the scenarios in greater depth, since, due to the rounding of the figures in the examples, the changes cannot be depicted with sufficient accuracy.

## Step II

In order to be able to assess the effect of a change in credit standing on the company's risk situation on this basis, we need to take a closer look in the second step at the capital requirement for the counterparty default risk on a reinsurer under Solvency II, which can be determined for each scenario using the prescribed risk factors (see Table 5).

A comparison of the capital requirement for the counterparty default risk for each scenario with the economic capital demonstrates clearly that the combination of an extreme event and the downgrading of a reinsurer can result in a huge increase in the capital requirement.

In the extreme Scenario 3, around three quarters of the available capital must be used to cover the counterparty default risk.

And if the investments were primarily in government bonds with short maturities, it would even be possible for the capital requirement for the counterparty default risk to be the largest component of the overall risk capital. Moreover, it can be assumed that in this scenario the available capital would barely be sufficient to meet all capital requirements under Solvency II.

## Conclusion

The results show that Solvency II will demand a higher level of awareness of stress situations on the part of risk managers when they select their reinsurance partners. However, the Solvency II qualitative requirements such as the ORSA process and the Supervisory Review Process should result in management tightening and enhancing their business partner selection procedures. Crucial questions are: What business strategy should be pursued? What risk strategy can we derive from it? What are the benefits of working with a particular business partner? How much can we allow implementation of the strategy to cost? The financial strength of a business partner is not the only criterion. However, choosing financially strong partners will safeguard competitive advantages for the future – not least because they will continue to provide substantial capacity even in times when capital is scarce.

## Other factors to be considered when measuring the counterparty default risk for reinsurance receivables

Apart from financial strength, the number of reinsurance partners is an important factor in the measurement of the capital requirement. Risk management can help make a company less vulnerable to losses resulting from reinsurer default by diversifying its risk on reinsurers. However, it cannot be assumed that concentrating reinsurance on a single reinsurer with a good rating will result in a higher risk than spreading it across a number of reinsurers with worse ratings.<sup>6</sup> Even if companies do not group reinsurers together and the diversification effect resulting from the use of reinsurers is taken into

account, the counterparty default risk on financially less robust companies is fundamentally higher and not necessarily fully compensated by the risk relief provided by diversification. Thus, spreading the risk across several reinsurers is not always beneficial, especially if the reinsurers concerned have a variety of ratings.

As the chart below illustrates, the percentage of the LGD that must be held in risk capital almost doubles with each drop in rating class. For example, diversifying risk by changing from a single AA-rated business partner to six separate A-rated counterparties would increase the capital requirement by almost 2%. From a quantitative perspective, concentrating the risk on a financially strong company therefore appears to produce a better result.

**Figure: Counterparty default risk capital requirements**  
(in % of the sum of loss given default)

