Background

Over the last few years, we have seen supervisory systems for insurance companies all around the world undergoing transformation. The principles defined by the International Association of Insurance Supervisors (IAIS) stipulate that both balance sheets and risk capital should be based on economic valuations. The basis of an economic balance sheet – as used for Solvency II, for example – is a valuation of all assets and liabilities in accordance with economic principles.1

This article explains the treatment of reinsurance in an insurer’s economic balance sheet. Sums potentially receivable from reinsurers are shown on the assets side of the balance sheet as “recoverables from reinsurance contracts”.2

The economic balance sheet

Unlike the current solvency regulations, Solvency II requires companies to produce an economic balance sheet representing a risk-based view of the entire balance sheet as at a given date. Both assets and liabilities are recognised at market-consistent values, which require a deep, liquid and transparent market. Assets can be relatively easily valued, but liabilities pose a greater problem.

The liabilities side of the economic balance sheet substantially consists of the technical provisions and capital (“own funds”). The value of the technical provisions is the amount an insurance company would require in exchange for taking over and meeting the obligations.

This equates to the sum of the “best estimate” of the liabilities and the risk margin. To calculate the best estimate of the liabilities, the probability-weighted average of the expected present value of future cash flows based on the risk-free yield curve should be used.3

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3 Refer to the following Knowledge Series issue for more detailed information on best estimates: http://www.munichre.com/publications/302-07063_en.pdf
The risk margin, on the other hand, represents the capital costs of the non-hedgeable risks included in the best estimate. We will take a more detailed look at the way the risk margin is calculated later in this article.

The own funds are a balancing item – equal to the balance remaining after deducting the value of the liabilities from the market value of the assets. Some supervisory systems provide for different classes of capital – “tiers” – depending on its availability and quality. There are restrictions on the eligibility of certain tiers for use as cover for the quantitative solvency requirements. The Solvency II technical specifications include a list showing the tiers to which different types of capital are to be allocated.4

Figure 1 shows the components of an economic balance sheet.

Fig. 1: Economic balance sheet under Solvency II

Treatment of reinsurance in the economic balance sheet

In some local accounting systems, technical provisions are shown in the balance sheet net of reinsurance, with the gross provisions being reduced by the percentage of the insurance business ceded to reinsurer.

By contrast, in the economic balance sheet, the gross provision – as with IFRS – appears as a liability, i.e. amounts recoverable under reinsurance contracts are not deducted. The reinsured portion is shown on the assets side as “recoverables from reinsurance contracts”, corresponding to claims on the reinsurer less payments due to the reinsurer (e.g. reinsurance premiums).

As shown in Figure 2, purchase of reinsurance also has another implication for the balance sheet: it reduces the risk margin. The best estimate of the liabilities, however, is unaffected by the purchase of reinsurance and is always shown gross, i.e. before reinsurance. We will now take a detailed look at the two main effects on the balance sheet – the creation of the asset “recoverables from reinsurance contracts” and the reduction in the risk margin.

Determining the “recoverables from reinsurance contracts”

The calculation of the “recoverables from reinsurance contracts” is effectively based on the cash flows between reinsurer and insurer over the term of the contract. From the perspective of the insurer, it is the expected contribution by the reinsurer to its underwriting liabilities.

The following requirements should be taken into account when calculating the recoverables from reinsurance contracts:

- The calculation must be consistent with the “contract boundaries” in the underlying insurance and reinsurance contracts.
- The recoverables from reinsurance contracts must be determined separately for each counterparty. For non-life, they must be calculated separately for premium and loss reserves.
- Recoverables from reinsurance contracts, financial reinsurance and special-purpose vehicles must be calculated separately.

- The cash flows from reinsurance contracts may only include those recoverables that relate to indemnification for insurance events and outstanding insurance liabilities. The following payments must be taken into account:
  - Future reinsurance premiums
  - Payments linked to indemnification for insurance events and claims outstanding
  - Profit commissions
- If a deposit is to be provided, the balance sheet items must be adjusted accordingly to avoid duplication.
- The difference in timing between the recoverables and the direct payments must be taken into account.
Pursuant to Article 81 of the Solvency II Directive, the recoverables from reinsurance contracts determined as described above must be “adjusted to take account of expected losses due to default of the counterparty. That adjustment shall be based on an assessment of the probability of default of the counterparty and the average loss resulting therefrom (loss-given-default).” Thus, the “recoverables from reinsurance contracts” item takes account of the expected default of the reinsurer. The unexpected default, on the other hand, is depicted in the “counterparty default risk” module.

To determine the expected default, an adjustment factor is calculated that takes into account the possible defaults under reinsurance contracts over the whole period, with default probabilities depending on duration.

A comparison of the valuations of government bonds and corporate bonds illustrates the point. As can be seen from Figure 3, though in the year of redemption (T+3) both bonds have the same value, today the corporate bond has a lower value than the government bond. The reason is that corporate bonds (normally) have a higher default risk than government bonds.

The adjustment equates to the expected present value of the change in cash flows from the recoverables against the counterparty at a given time that would result from the counterparty’s default. The reason for the default (including insolvency or legal disputes) is immaterial.

Thus, to calculate the adjustment factor, the expected payments by the reinsurer to the insurer (Ct) are included for each year (t). Further, a “recovery rate”, which depends on the counterparty and takes account of the fact that a portion of a receivable will still be recovered even in the event of default, is applied.

The amount that an insurer would lose if the reinsurer defaulted, the “loss given default”, is defined as the product of the expected payments (Ct) and the percentage of the receivable that the reinsurer would be unable to meet (100% minus the recovery rate). In the example shown in Table 1, a recovery rate of 50% and a three-year duration is assumed.

Whilst in the first year, payments expected for all three years could be lost, by the third year only payments expected in that year are at risk from default by the reinsurer. For simplicity, the present values of the individual payments have not been calculated in the example.

<table>
<thead>
<tr>
<th>Default of reinsurer in (year)</th>
<th>Loss given default</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>-50% × (C1 + C2 + C3)</td>
</tr>
<tr>
<td>2</td>
<td>-50% × (C2 + C3)</td>
</tr>
<tr>
<td>3</td>
<td>-50% × C3</td>
</tr>
</tbody>
</table>

The loss-given-default figures calculated are then weighted with the reinsurer’s default probability (PDt) corresponding to the term.

In the above example, the recoverables from reinsurance contracts must be reduced by

\[ PD_1 × (-50% × (C1 + C2 + C3)) + \]
\[ PD_2 × (-50% × (C2 + C3)) + \]
\[ PD_3 × (-50% × C3) \]

to take account of the expected default of the reinsurer.
The recovery rate and the default probability should be based on current, reliable and credible information. EIOPA has stipulated that the maximum recovery rate that may be applied is 50%.

Ideally, “point-in-time” assumptions, i.e. particular dates, should be used for the calculation of the default probability. According to EIOPA, the assumptions should be based on a realistic assessment rather than on average default forecasts, which is effectively an economic approach. It should be kept in mind when adopting this approach that default probabilities over a series of years are cumulative, so that the default probability for a reinsurer for the next two years is higher than for a single future year.

If “point-in-time” assumptions are not available, a company may use “through-the-cycle” assumptions, which are based on an average default forecast over a longer period (e.g. an economic cycle).

In practice, default probabilities are determined by a reinsurer’s rating. With the above approach, a lower rating produces a lower recovery rate and a higher default probability, which increases the amount of the adjustment to be deducted from the recoverables from reinsurance contracts, thus reducing assets. Moreover, a lower rating implies a higher counterparty default risk, and thus a higher risk margin. In short, own funds will decrease if a reinsurer has a lower rating. Conversely, a higher rating has a positive effect on own funds.

Figure 4 shows the adjustment factors for different ratings and durations. For simplicity, the chart assumes that the current default probability used for counterparty default risk purposes is applicable for the whole period.5

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5 Cf. Technical Specification on the Long Term Guarantee Assessment; 28 January 2013; SCR.6.19. For ease of comprehension, in particular for the higher ratings, the figures are also shown in tabular form.
Fig. 5: Adjustment of reinsurance recoverables in the balance sheet

Figure 5 shows how the expected loss on reinsurer default is taken into account by adjusting the recoverables from reinsurance contracts.

Differentiation between expected and unexpected loss
The new rules under Solvency II, Europe’s new supervision system, require that the recoverables from reinsurance contracts in the economic balance sheet have to be adjusted for the expected default applicable to a company’s reinsurer. The unexpected default, on the other hand, is accounted for in the Solvency II standard approach in the calculation of the risk capital.

Solvency II’s current technical specifications\(^6\) provide for two types of exposure:

- Type 1 relates to exposures that are not necessarily diversified and where the counterparty usually has a credit rating.
- Type 2 comprises all other exposures, i.e. exposures that are usually diversified and where the counterparty does not have a credit rating.

Capital requirements are calculated separately for each type. Diversification effects are recognised to a small degree when the figures are aggregated to obtain the total capital requirement.

Reinsurance contracts are classified as Type 1 exposure, for which the capital-requirement calculation is based on loss given default and the default probability. As explained in the previous section, the default probability depends on the counterparty’s rating, or on the solvency ratio for counterparties without a rating. The loss given default indicates the loss of capital that would result from the default of a counterparty. Included in its calculation are the risk mitigation effect of risk sharing, the risk-adjusted market value of any collateral\(^7\) and claims on the counterparty. A “recovery rate” depending on the counterparty is also deducted.

Overall, economic capital increases. It is evident that a holistic view of a reinsurance contract has to be taken to evaluate both its effect on the risk model and the balance sheet, and the reinsurer’s credit standing. This treatment of reinsurance underlines the need for an economic assessment to be holistic.

Impact of reinsurance on the risk margin

In addition to the effects described above, reinsurance also reduces the risk margin (cf. Figure 2).

As we have already seen, the technical provisions include not only the best estimate, but also the risk margin, which acts as a loading for non-hedgeable risks. In the standard approach, a CoC (cost-of-capital) rate of 6% is used in the calculation of the risk margin. The use of the CoC method is based on the assumption that if a hypothetical “empty” company (“reference undertaking”) were to take over an insurance company’s liabilities, it would have to meet certain solvency capital requirements in the future in order to cushion fluctuations during the run-off of the business assumed.

The following four risk categories are included in the calculation of the risk margin:

- Underwriting risk
- Counterparty default risk arising out of reinsurance contracts
- Operational risk
- Unavoidable market risks

Reinsurance affects two of these risk categories. Counterparty default risk increases as a result of the risk of unexpected default by the reinsurer, while reinsurance reduces underwriting risk substantially. Choosing a reinsurer with a good rating can limit the effect on counterparty default risk. Since operational risk is recognised on a gross basis, it is unaffected by the purchase of reinsurance. Overall, reinsurance will have the effect of reducing the risk margin.

Thus, reducing the risk capital in the risk model by means of an optimal reinsurance contract is not the only benefit for insurance companies. They can achieve two other positive effects by working with reinsurers with good ratings. Firstly, all other things being equal, a good rating will result in a smaller adjustment to the recoverables from reinsurance contracts and hence higher assets, and secondly, it will produce a larger reduction in the risk margin because the decrease in underwriting risk will more than compensate for the increase in counterparty default risk.

Solvency Consulting for your Company

Munich Re supports its clients on all Enterprise Risk Management (ERM) issues. Solvency Consulting has a wealth of experience in dealing with the standard formula, the development and use of internal stochastic risk models and their relevance to value-based portfolio management. We also play an active role in industry committees looking at regulation and specialist issues and ensure that knowledge and expertise are transferred and translated into practical recommendations for action on the ground. We are thus able to offer our clients real and efficient help on ERM topics.

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