Article from

Financial Reporter

December 2017
Issue 110

IFRS 17 Risk Adjustment Confidence Level Disclosure

By Leonard Reback

Under IFRS 17, the new insurance contracts standard under International Financial Reporting Standards (IFRS) which goes into effect in 2021, one element of the reserve for long-duration insurance contracts is a risk adjustment for non-financial risk. This risk adjustment reflects "the compensation that the entity requires for bearing the uncertainty about the amount and timing of cash flows that [arise] from non-financial risk."[1] IFRS 17 does not specify a particular method or technique for calculating the risk adjustment. But if an entity uses a technique other than a confidence level, the entity is required to disclose the "confidence level corresponding to the results of the technique."[2]

This required confidence level disclosure has caused some consternation among actuaries implementing IFRS 17. For many long-duration contracts, techniques other than confidence levels are typically used. For example, Solvency II liability calculations incorporate a risk adjustment, but this risk adjustment is calculated using a cost of capital technique. Many companies also use cost of capital techniques for risk management purposes.

It is not immediately obvious how to convert a risk adjustment calculated using a cost of capital technique, or some other technique such as a cumulative tail expectation, into a confidence level. If the best estimate cash flows were calculated over stochastic scenarios one might be tempted to map the present value of best estimate cash flows plus risk adjustment against the distribution of present values over the stochastic scenarios in order to estimate the confidence level. However, this has a serious flaw. The stochastic scenarios would typically be drawn over financial scenarios, such as interest rates or equity returns. The risk adjustment confidence level we need to calculate is specifically for non-financial risks. So the distribution of stochastic scenarios generated for the purpose of calculating best estimate cash flows may not be relevant to the risk adjustment for non-financial risk. Also, for many contracts it may not even be necessary to generate stochastic scenarios.

CONFIDENCE LEVEL FOR COST OF CAPITAL RISK ADJUSTMENT

If the risk adjustment for non-financial risk is calculated using a cost of capital technique, it may be possible to convert the risk adjustment to a confidence level by applying some fairly reasonable assumptions. Under a cost of capital technique, a low probability adverse scenario is selected as the level of capital that needs to be held. The adverse scenario would typically reflect adverse events over a relatively short time horizon, say one year, which impact all future cash flows in the contract. Different adverse scenario levels may apply, say a 99th percentile event or a 99.5 percentile event or a 97.5 percentile event. The level of required capital is projected over time, and assumed to incur a certain cost. Then the cost of capital projected over time is discounted back to the valuation date in order to determine the risk adjustment.

Let's assume that the risk adjustment was calculated assuming capital was required to be held for a 99th percentile event. If we assume that the present value of cash flows is normally distributed, a 99th percentile event corresponds to an event 2.33 standard deviations from the mean (i.e., the z-score corresponding to a 99th percentile event is 2.33). And under a normal distribution, the best estimate corresponds to the mean itself. So under a normal distribution assumption we have two data points (i.e., the best estimate and the level for which we assume required capital needs to be held) from which we can estimate the mean and standard deviation of the distribution of cash flows under non-financial risk. Using this mean and standard deviation we can calculate the confidence level corresponding to the risk adjustment.

EXAMPLE

Assume we have the following:

- Present value of best estimate cash flows: $100,000;
- present value of cash flows at 99th percentile, used to determine required capital: $150,000; and
- calculated risk adjustment based on these parameters: $20,000.

Under a normal distribution assumption, the mean of the distribution is $100,000. The standard deviation can be determined as:

(150,000 – 100,000)/2.33 = $21,459, where 2.33 is the z-score corresponding to a 99th percentile.[3]

So the present value of cash flows for this contract is assumed to be normally distributed with a mean of $100,000 and a standard deviation of $21,459.

To get the confidence interval associated with a $20,000 risk adjustment we need to find the z-score associated with the present value of best estimate cash flows plus the risk adjustment, or $100,000 + $20,000 = $120,000.

The z-score is calculated as:

(120,000 – 100,000) / 21,459 = 0.93.

So the calculated risk adjustment is 0.93 standard deviations from the mean. Checking a standard normal distribution table tells us that a z-score of 0.93 corresponds to an 82nd percentile. So we can estimate that the calculated risk adjustment corresponds to an 82 percent confidence level.

POSSIBLE OBJECTIONS

There are a number of objections that can be raised against this approach. One possible objection is the fact that the percentiles used to calibrate the normal distribution are somewhat subjective. But this is a function of the risk adjustment itself. To the extent that this subjectivity is appropriate for the risk adjustment itself, it should not be inappropriate for a disclosure about that risk adjustment.

Another possible objection is the time horizon. This approach considers the impact of experience deviations over a shorter period than the life of a long-duration contract, although it does account for the resulting cash flow changes over the entire life of the contract. It could be argued that it would be more appropriate to consider deviations over the entire life of the contract. On the other hand, the most typical applications of confidence level risk adjustment calculations are for short-duration contracts, in which experience deviations would by definition only occur over a relatively short time horizon. Also, IFRS 17 does not specify a term over which the confidence level needs to be calculated. This implies that an approach such as the one proposed, in which deviations over a period shorter than the life of the contract are considered, can be appropriate, presumably with disclosures to describe how the calculation was performed.

Another possible objection is the assumption that a normal distribution is appropriate for calibrating the risk margin confidence interval. Indeed there is no guarantee that the normal distribution will fit the actual pattern of deviations. But to the extent that the performance of the group of contracts is subject to a large number of not too dependent events, a normal distribution is probably a reasonable assumption, and probably no less reasonable than common uses of normal distributions in IFRS 17 calculations, such as projecting economic scenarios.

That said, if one believes that the normal distribution is not a reasonable assumption, there is a possible modification. Of course, if one can specify an alternative distribution for the present value of cash flows from the group of contracts then the proposed approach can be applied to the alternative distribution. If an explicit distribution cannot be specified, one might be able to estimate a few percentile events in addition to the one used in the risk adjustment calculation. For example, if the risk adjustment was based on a 99th percentile, one might also be able to specify a 90th percentile event and a 75th percentile event. With several such data points including the best estimate, assumed to be the 50th percentile event, one can fit a curve using a method such as a cubic spline. Then the confidence interval can be interpolated based on the fit curve. ■

Leonard J. Reback, FSA, MAAA, is vice president and actuary at Metropolitan Life Insurance Company in Bridgewater, New Jersey. He can be reached at *lreback@metlife.com.*

ENDNOTES

1 IFRS 17, paragraph 37

2 IFRS 17, paragraph 119

3 If the required capital was determined at a different level, the z-score would need to correspond to the level used. If 97.5 percent was used to determine required capital then we would use 1.96 as the z-score.