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IFRS 17 Risk Adjustment—Insights from a Practical Example

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Since the publication of IFRS 17 by the IASB in May 2017, companies that are impacted by the new accounting standard have been working through both practical and technical considerations. In this article, we will examine potential approaches to the calculation of the risk adjustment component, with a focus on a case study related to a universal life insurance product. This case study highlights the inherent characteristics and potential tradeoffs of calculating the risk adjustment under two different approaches.

GUIDANCE

The IFRS 17 general measurement model has three key components: the present value of future contract cash flows (which we'll refer to as the best estimate liability, or BEL), the risk adjustment and the contractual service margin.

The BEL represents the probability-weighted present value of insurance cash flows such as premiums, claims, benefits and expenses. The contractual service margin is a deferred profit mechanism that is solved for at issue to avoid time-zero gains after taking into account the initial BEL and the risk adjustment. This margin is then amortized into income over the life of the contract. While the actuary must demonstrate considerable judgment to derive both of these components, the risk adjustment component requires perhaps the most interpretation and judgment. IFRS 17 states that "An entity shall apply judgment when determining an appropriate estimation technique for the risk adjustment for non-financial risk." The company should "provide concise and informative disclosure so that users of financial statements can benchmark the entity's performance against the performance of other entities."[1] In addition, IFRS 17 requires the risk adjustment to meet qualitative characteristics as defined in paragraph B91.

IFRS 17 requires an explicit recognition of the risk adjustment in the financial statements to account for the compensation required by the entity due to the variability of potential outcomes of future cash flows. In many parts of the world, it has been common to include risk as a key component in financial reporting. Financial reporting professionals are familiar with the "risk adjustment" concept, whether through setting assumptions that include specific provisions for risk, or explicitly computing a provision following prescribed approaches. However, the principle-based requirements under IFRS 17, along with associated disclosures on confidence level, current period changes in the risk adjustment, the nature and extent of risks, etc., demand a greater level of overall effort and professional judgment, as well as resultant scrutiny from auditors.

SUMMARY OF RISK ADJUSTMENT CALCULATION TECHNIQUES

IFRS 17 does not specify the technique to be used for determining the risk adjustment, nor does it provide specific examples of possible techniques to be considered. Intended to be educational material, the 2018 IAA publication on IFRS 17 risk adjustments[2] introduces some common techniques that have been employed in relevant accounting and regulatory frameworks, out of which the application of quantile techniques and the cost of capital (CoC) approach are discussed in detail.

The Value at Risk (VaR) approach is a common statistical measure whereby a desired confidence level is chosen. The confidence level represents that probability that the actual outcome will be less than the expected value. This approach, along with the conditional tail expectation (CTE) approach, are sometimes referred to as quantile techniques. These techniques are useful to the risk adjustment determination as they are rooted in statistical theory and can be graphically represented and easily communicated to non-technical audiences. While it may be easier to meet the confidence level disclosure requirement under the quantile techniques, careful consideration needs to be given for an appropriate quantile level when quantiles are also used to measure tail risk in the case of capital adequacy and/or solvency.

The CoC approach aligns a company's selection of a capital amount to the risks that are covered in the IFRS 17 measurement model. The cost to the company of holding this capital is measured as the required return on shareholder capital in excess of the earnings to that capital. This technique requires several inputs, including a risk level acceptable to ensure the proper capital level, a cost of capital rate, and a discount rate. For purposes of IFRS 17, the capital amount covers only non-financial risks to the insurance cash flows.

Additional techniques being considered range from the simplistic (adding a flat percentage to future cash flows) to the highly technical (advanced statistical techniques such as Wang transform or copulas). There are tradeoffs to each of these approaches, as discussed in the 2018 IAA publication and other educational literature. To further compare the potential differences between the quantile (in particular, VaR) and CoC techniques, we conducted a case study.

CASE STUDY

Our case study focused on a level death benefit universal life product. Key assumptions for our case study are summarized below:

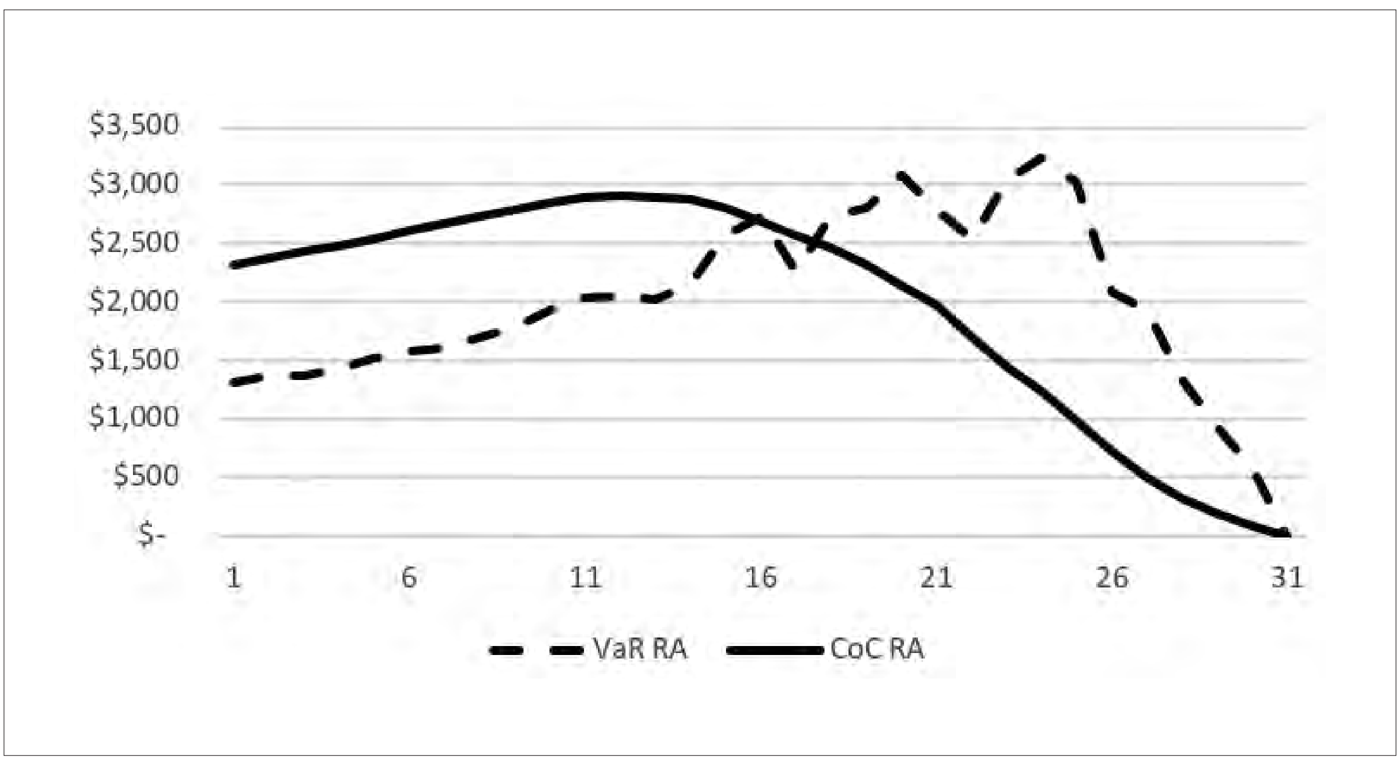
- 15-year surrender charge schedule.
- Level annual premium assumed to be paid for the life of the projection, regardless of the interest rate scenario.
- 30-year projection period.
- Lapse and mortality assumptions were set based on an insurance company's best estimate experience.
- 200 interest rate scenarios were generated using the American Academy of Actuaries interest generator tool.
- Asset earned rate set at 200 basis points above the 10-year Treasury rate at each duration for each scenario.
- Policyholder crediting rate set to 100 basis points less than the earned rate, subject to a 2 percent minimum crediting rate.
- The BEL discount rate is established using the "bottom-up" approach and derived by adding a 250-basis points illiquidity premium to the 10-year Treasury rate at each duration for each scenario.

We generated stochastic cash flows and selected the 95 percent quantile to determine the level of capital required at each time step. CoC risk adjustments were then calculated based on a 6 percent cost of capital rate and an 8 percent discount rate. Risk adjustments under the VaR approach were also calculated. In order to bring the results together for comparison, the quantile level under the VaR approach was calibrated such that, on average, the risk adjustment for the CoC approach equals the risk adjustment for VaR.

RESULTS & OBSERVATIONS

The resulting risk adjustment at each time step, under both the VaR and CoC approaches is shown in Figure 1. Our key takeaways from this example are as follows:

Figure 1
Risk Adjustment Baseline Case



- **VaR estimates start off lower, build up over time and reach their peak later than the CoC estimates.** Consider that the VaR is simply the excess over the mean of the BEL, which itself is the present value of the sum of future cash flows. The very nature of this measurement will tend to focus on the variability in the potential future outcomes as of a given point in time. The CoC also takes the BEL variability into account, but has a second dimension as well, namely the anticipated future capital needs due to adverse outcomes in the future, which can be seen from a typical CoC formula:

$$\text{Cost of Capital Amount} = \sum_{t=1}^{n} \frac{CoC\ Rate_t * Capital_t}{(1 + discount\ rate_t)^t}$$

where the capital amount in this case is determined based on the 95th percentile of the BEL distribution.

This phenomenon can be seen when examining the two measurements at issue. The variability in the BEL is minimal as extreme outcomes resulting from divergent interest rate scenarios are muted by the effects of decrements and discounting. The CoC, on the other hand, starts off as a higher amount to account for the strain on capital cost due to future variability in the BEL, inclusive of that which is experienced at issue. As a result, it is reasonable that the CoC estimate exceeds the VaR estimate at issue.

When the projection reaches its final years (consider years 20–25 in the case study example), interest rate paths have had time to diverge and therefore generate maximum variability in the underlying cash flows. Material business remains in these periods and the effect of discounting is minimized as there are relatively few years remaining in the projection. As such, the highest value of the risk adjustment under the VaR approach occurs in these periods, which also aligns with the maximum values of the BEL and further indicates that VaR is a point in time estimate.

A direct implication of the observation above is that the CoC approach over time produces risk adjustments corresponding to declining confidence levels, for an in-force block. While the CoC approach is relatively easy to implement, especially for those entities that already report under Solvency II, additional consideration should be given to this approach if the entity plans to target a certain confidence level.

- **The CoC approach demonstrates a smoother overall pattern relative to the VaR approach, which leads to a smoother earnings pattern.** The previous example demonstrates a smooth, humpback pattern for the CoC approach and a jagged, more volatile pattern for VaR. This pattern is again attributable to the nature of the calculation. As time passes and we observe more volatility in the BEL, the VaR captures the discrete changes in volatility from period to period. In comparison, the spikes in volatility from period 15 to 25 in the example are accounted for in the CoC calculation starting from issue.

In addition to a smoother overall pattern, the CoC calculation reacts sooner for future cash flow variability. In the above example, the highest standard deviation for the BEL is in the 25th duration, which is when the VaR risk adjustment reaches its peak. In contrast, the accrual of the CoC risk adjustment begins immediately and steadily increases over time.

Considered in tandem, the accrual and release pattern along with the earlier recognition of cash flow variability has a direct impact on earnings. Since the release of the IFRS liability, and more specifically the risk adjustment component, is a source of income, the CoC approach contributes to a smoother overall earnings pattern and earlier recognition of income. The VaR approach holds back the earnings until later in the projection when risk adjustment decreases sharply as the cash flow variability decreases.

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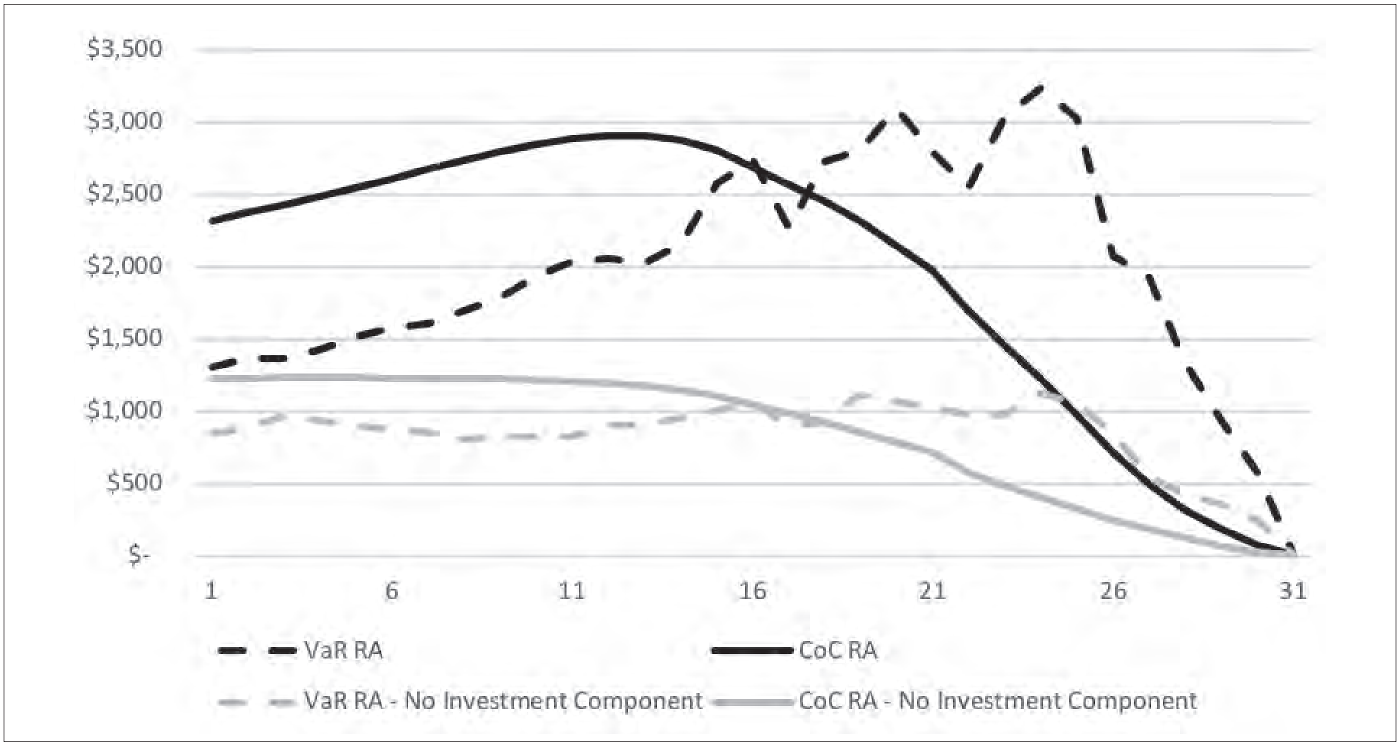
Our baseline example above considered the full-face amount as the benefit to be paid upon death in the calculation of the BEL. This construct implicitly includes the "investment component"[3] of the universal life product, which is essentially the cash surrender value. Strictly speaking, this isn't an insurance cash flow as the cash surrender value will ultimately be paid out to the policyholder, either as a portion of the death benefit or as a benefit upon surrender. Thus, it can be argued that this component should be excluded from the liability cash flows in the risk adjustment calculation, even though it remains part of the IFRS 17 insurance liability. However, a counter-argument is that the timing of when such benefit is paid out is driven by insurance risks (e.g., lapse or death). To study the effect of the investment component, we performed a secondary analysis where the investment component is removed from benefit payouts. Key observations from this secondary example are shown in Figure 2 and summarized in the next paragraph.

Figure 2
Risk Adjustment (No Investment Component)



- **The removal of the investment component leads to overall lower risk adjustments in both magnitude and volatility, under the VaR and COC approaches.** Removing the investment component reduces the cash outflow from the insurer's perspective. This directly reduces the expected value of the BEL, as well as the variability of the BEL (except when the investment component stays constant over time which is rarely the case). Since both the VaR and CoC depend on the BEL, a reduction in the risk adjustment across time periods is the intuitive result. An examination of the results reveals a secondary impact, namely that the sharp peaks that were present in the base case for the VaR approach are not nearly as severe. This result is a reflection of not only the overall reduction in the BEL previously discussed, but also an overall reduction in the BEL's variability at any given point in time. The overall pattern and release of the risk adjustment are similar for both the VaR and CoC approaches relative to the base case, but the differences between the two approaches are minimized when the investment component is removed.

Clearly, the removal of the investment component changes the overall results and relationship between the VaR and CoC approaches. These differences will tend to be magnified for products with significant investment components (e.g., fixed deferred annuity) and minimized when there is little or no investment component (e.g., traditional whole life, term life).

CONCLUSIONS

The observations comparing the two approaches considered in our case study have similar limitations as those of any actuarial model, especially one analyzing a single policy. In particular, the results shown above are sensitive to model assumptions and input parameters and may not be representative for a larger block of business. In addition, the capital calculation is greatly simplified in the example. In reality, a company's risk appetite and capital philosophy will need to be taken into account and calibrated appropriately for purposes of the IFRS 17 risk adjustment calculation.

The case study highlights the fundamental mathematical constructs and inherent differences of both the VaR and CoC calculation approaches. These constructs drive fundamentally different risk adjustment patterns and income recognition. The inclusion or exclusion of an investment component in the analysis adds an additional layer of complexity.

As each company continues through their IFRS 17 transition journey, their actuaries and finance professionals will need to carefully consider the various IFRS risk adjustment calculation techniques, and ensure the chosen method and the resultant outcome meet the requirements set out in IFRS 17 such as the five qualitative characteristics in paragraph B91. It is important that the produced risk adjustments are understood and explainable, meet internal risk tolerance requirements, align with the underlying risk profile, and are carefully documented and supported by management. ■

The views reflected in this article are the views of the authors and do not necessarily reflect the views of Deloitte.

ENDNOTES

1 IFRS 17, Appendix B, paragraph B92

2 International Actuarial Association. Risk Adjustments for Insurance Contracts under IFRS 17. 2018. See more information at https://www.actuaries.org/IAA/Documents/Publications/News_Releases/2018/News_Release_Risk_Adjustment_Monograph_EN.pdf

3 Defined in IFRS 17, Appendix A

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