IFRS 17: Risk Adjustment—A Numerical Example

By Nan Jiang

Under IFRS 17, the new International Financial Reporting Standard (IFRS) for insurance contracts, the total liability of insurance contracts is the sum of the best estimate liability (BEL), risk adjustment (RA) and contractual service margin (CSM). CSM represents the future profit margins from insurance contracts that will be released over the coverage period and it is solved at initial recognition such that the total liability is equal to zero, similar to the net to gross ratio concept under US GAAP Long Duration Targeted Improvements.

RA is needed under IFRS 17 to reflect the compensation that a company requires for bearing the uncertainty about the amount and timing of the cash flows that arises from non-financial risk. Companies are also required to disclose the method and confidence level used for the calculation of the RA. However, IFRS 17 doesn't specify a method and a confidence level, nor does it provide a list of specific risks that are considered to be non-financial risk. Companies need to define them based on their own preferences or existing practices. This article will introduce available approaches and discuss the confidence level approach with potential consideration stemming from industry preferences and illustrative examples.

THE APPROACH

The industry discussions are mainly focused on a prior exposure draft issued in 2010 that lists three techniques for estimating the RA:

a. Confidence level;
b. conditional tail expectation (CTE); and
c. cost of capital (CoC).

So far, the CTE is the least preferred method because it measures the expected loss on the portfolio as an average of outcomes occurring above the specified confidence level, requiring multiple scenarios or stochastic scenarios for each nonfinancial risk. It is therefore operationally more complex than the other two methods.

Both the confidence level and the CoC approaches are preferred, but the confidence level approach has some advantages. It is relatively easy to implement if the company already has a shock-based capital framework such as Solvency II or international capital standard (ICS), especially with an internal model method to derive its own stress factors, and no need to solve for a confidence level for disclosure. Results under the confidence level approach will also be relatively stable and smaller relative to the CoC approach, especially for long-duration portfolios. The confidence level approach is also less dependent on assumptions such as the cost of capital rate, capital projection approach and loss distribution.

KEY ISSUES

Despite the advantages, there will be four immediate items to consider with the confidence level approach:

1. Which risks shall be considered in RA? There is some clarity from the standard, such that operational risks should be excluded. Although nonfinancial risks are not clearly defined, similar standards can be referred to such as Solvency II, ICS or other capital regimes including companies' own economic capital. It might be worth mentioning that one reason the standard uses nonfinancial risks rather than insurance risks is that certain risks such as lapse or persistency risk are not considered as insurance risks under IFRS 17, but probably will be included in the RA calculation for most companies.

2. What confidence level should be used and how different will be the results? Industry-wide consensus so far is 70th to 80th percentiles, lower than what are required by capital requirements that are 99th or higher. ICS used to have a margin over current estimate (MOCE) which was around the 75th percentile. Hence, in the analyses shown in the next section, 70th, 75th and 80th are selected for confidence levels.

3. At which level is the RA calculated: policy level, company level or any level in between? In order to maximize the diversification benefits between risks, for example, mortality risk and longevity risk, companies may need to calculate the RA at a higher level. This will lead to the next question: how do they aggregate the policy level risks to the company level? For example, if one policy has positive mortality risk while the other has negative, there needs to be a determination whether there should be an offset. Also, how to calculate the correlation or diversification between risks is also important; for example, using a correlation matrix is probably common but how to set the correlation matrix requires judgment.

4. How is the RA allocated back to the group of contracts level? This consideration is necessary because the IFRS 17 level of aggregation requires contracts with different levels of profitability to be grouped separately. That is, onerous contracts and contracts with no significant probability of becoming onerous need to be grouped separately. Furthermore, groups by portfolio (high level product group) and issue year are also required under IFRS 17. The level at which profitability is determined varies by insurers. Some insurers will determine it at the policy level, and then they will need to allocate RA back to the policy level. Hence, how the RA is allocated will depend on the level at which the grouping is decided. The example in the next section uses policy level results for grouping, treating the base contract and associated riders to be one policy. Please note that whether base contracts and riders are considered as the same policy could be a separate topic.

RA APPROACH AND CONFIDENCE LEVEL

For the example, RA is calculated at the company level for a hypothetical company with a wide variety of products, including traditional life and annuity products, variable life and annuity products, as well as health products. Solvency II type risks including mortality, longevity, morbidity and lapses are considered except for expense risks, and they are calibrated to the 70th, 75th and 80th percentiles based on a normal distribution or historical experience. A correlation matrix is needed to aggregate all risks and calculate diversification benefits.

Figure 1 shows the comparison of 70th, 75th and 80th percentiles when using the confidence level approach, as well as a reference to a 99th percentile shock and CoC approach with a CoC rate of 6 percent and three types of capital run-off patterns: BEL, PV Outgo and Sum Assured (SA) projection.

Figure 1
Smaller RA Amounts From the Confidence Level Approach Than the CoC Approach

	BEL	Mortality	Longevity	Morbidity	Mass Lapse	Lapse	Pre-Diversified RA	Post-Diversified RA	% of RA to BEL	% of RA to PV Outgo	Diversification Ratio
70th Percentile	14,420	0.5	112	107	5	126	351	212	1.5%	0.8%	60%
75th Percentile	14,420	0.7	148	140	6	163	458	277	1.9%	1.0%	60%
80th Percentile	14,420	0.8	184	174	8	205	572	345	2.4%	1.3%	60%
99th Percentile	14,420	91	427	496	236	192	1,442	795	5.5%	2.9%	55%
CoC (BEL)	14,420	91	427	496	236	192	N/A	1,580	11.0%	5.8%	N/A
CoC (PV Outgo)	14,420	91	427	496	236	192	N/A	899	6.2%	3.3%	N/A
CoC (SA)	14,420	91	427	496	236	192	N/A	613	4.3%	2.3%	N/A

Figure 2
Validation of the Results of the Confidence Level Approach

	Post-Diversified	Difference (ratio to 70th)	z- Value (normal distribution)	Difference (ratio to 70th)
70th Percentile	212	1.00	0.52	1.00
75th Percentile	277	1.31	0.67	1.29
80th Percentile	345	1.63	0.84	1.60
99th Percentile	795	3.75	2.33	4.44

Figure 3
Different Diversification Benefits From the Three RA Risk Aggregation Methods

	BEL	Mortality	Longevity	Morbidity	Mass Lapse	Lapse	Pre-Diversified RA	Post-Diversified RA	% of RA to BEL	% of RA to PV Outgo	Diversi-fication Ratio
Company Level Aggregation	14,420	0.64	144	140	3	45	332	225	1.6%	0.8%	68%
Product Level Aggregation	14,420	0.64	145	140	5	106	396	245	1.7%	0.9%	62%
Policy Level Aggregation	14,420	0.67	148	140	6	163	458	277	1.9%	1.0%	60%

As a validation, the relationships of the post-diversification results between different percentiles as shown in Figure 1 is confirmed to fit a normal distribution as shown in Figure 2.

RA RISK AGGREGATION METHOD

Since we are calculating the RA at the company level in the example, three RA risk aggregation methods that have different degrees of potential offset benefits are tested:

1. Company level aggregation: allowing company level offsetting of "positive" and "negative" risks. Negative risk amount is never floored at zero. The offset impact is the largest.

2. Product level aggregation: allowing offsetting of "positive" and "negative" risks within a product. Once determined, negative risk at the product level is floored at zero. There are potential offset impacts.

3. Policy level aggregation: no offsetting allowed. All risks are floored at zero for each policy. There is no offset impact.

The floors are used in this example to avoid negative RAs at each aggregation level before they are aggregated at the company level. In our example, policy level pre-diversified RA is used for RA allocation and negative RA could create issues.

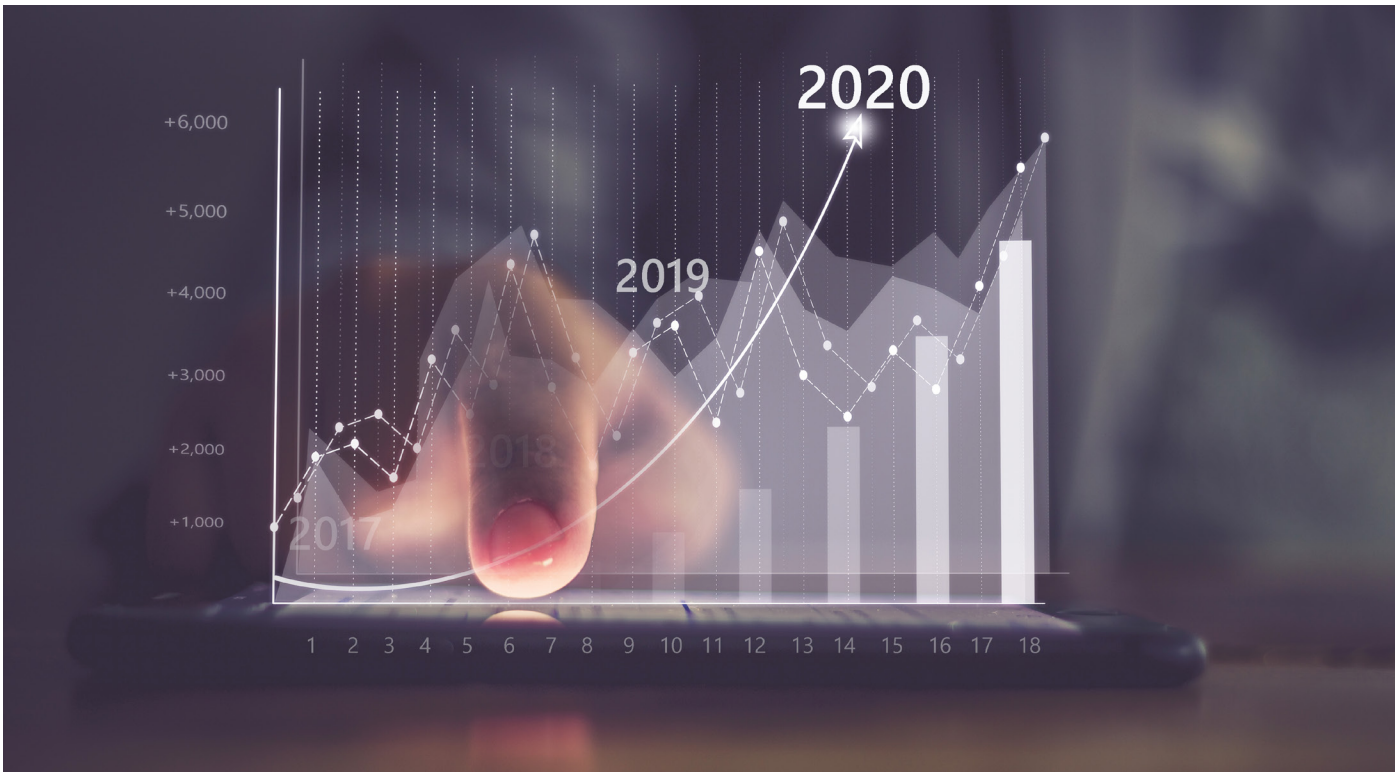
For example, let's consider a policy that has a mortality risk of 100, and a longevity risk of –150. Under the company level aggregation approach, the longevity risk of –150 is utilized to offset positive longevity risks from other product groups such as annuities. Under the product level aggregation approach, if the product group is life including life with annuitization options, –150 may be utilized as an offset of other policies within the product group. Or otherwise, if the product group does not have significant longevity risk, –150 may end up being floored at zero at the product level and the potential offsetting benefit is lost. The third approach will floor –150 at zero at the policy level resulting in losing the offset benefit. Thus, the difference between these three approaches will vary based on how much of the –150 risk could be used to offset the longevity risk.

Figure 3 shows the results of the three RA risk aggregation methods for the 75th percentile confidence level approach.

The diversification benefit is the largest under the company aggregation method as expected, but the differences are relatively small in this example. Thus, for this example, some deciding factors will be whether to keep consistency between a risk aggregation method and an RA allocation method, whether negative RA is allowed, and at which level the RA will be allocated back. The next section discusses further the RA allocation method assuming negative RA is not allowed.

RA ALLOCATION METHOD

There are different ways to allocate RA from the company level to groups of contracts or even to the policy level. I illustrate two methods of how to allocate RA to the policy level assuming negative RA is not allowed: 1) policy level pre-diversified RA



Ratio Method, and 2) marginal contribution to risk (MCTR) method.

The policy level pre-diversified RA ratio method is easy to understand, and it can be broken down into several steps:

Step 1: Calculate policy level pre-diversified RA and floor at zero;

Step 2: Aggregate policy level pre-diversified RA to have company level pre-diversified RA;

Step 3: Calculate the ratio of policy level pre-diversified RA to company level pre-diversified RA;

Step 4: Apply the ratio to company level post-diversified RA to calculate policy level post-diversified RA.

Marginal contribution to risk (MCTR) is a risk measure that is often used when assessing an asset portfolio's risks. Setting aside the detailed definition of MCTR itself, the allocation can be calculated as follows:

Step 1: Calculate company level diversification ratios for each risk;

Step 2: Apply the ratios to each corresponding policy level pre-diversified risk and sum up post-diversified risk amounts to determine the policy level RA.

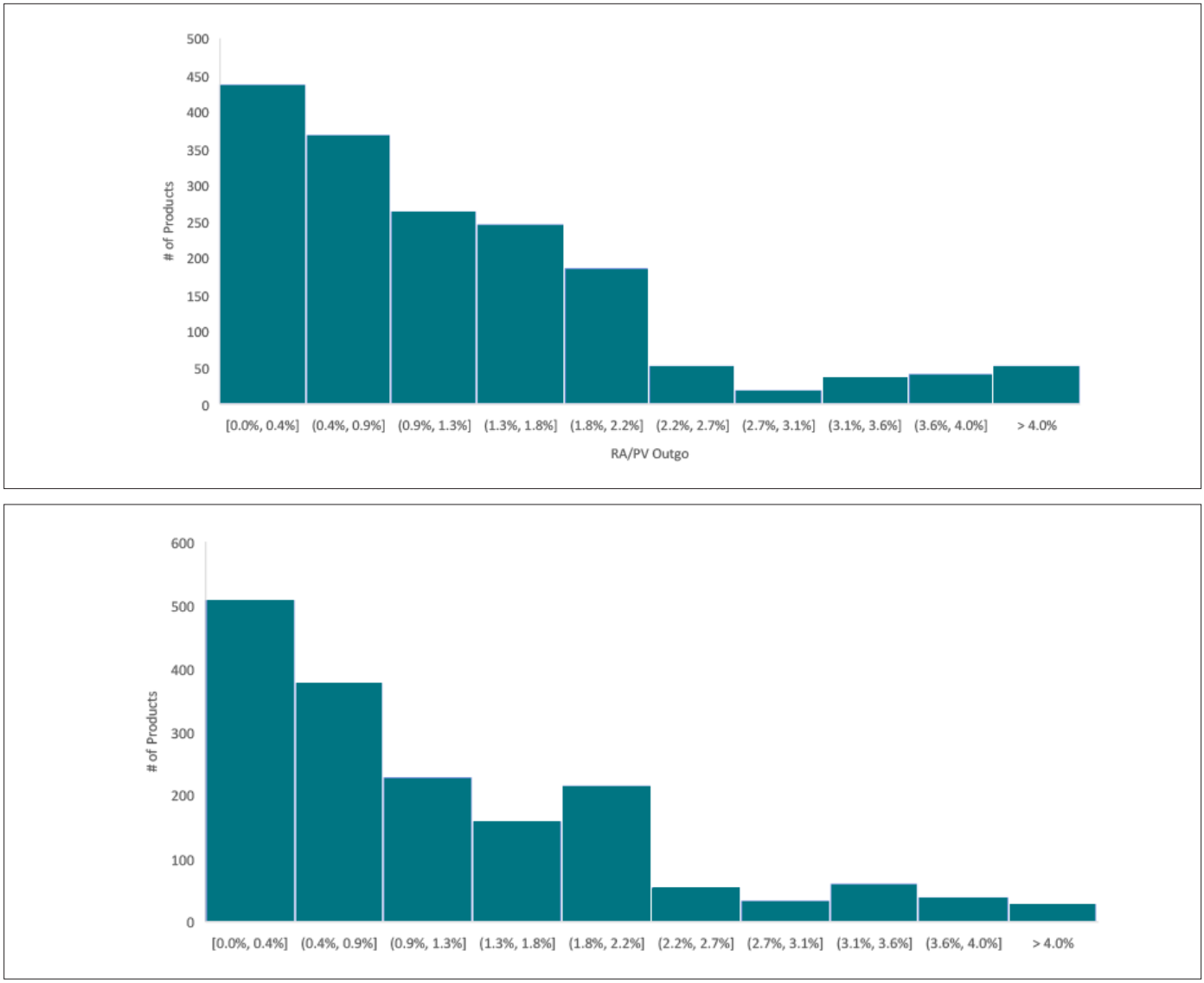
The difference from the policy level ratio method that applies one diversification ratio for pre-diversified RA is that the MCTR method will apply different diversification ratios to different risks as shown in Figure 4. Therefore, the MCTR method might be able to better reflect the risk profiles in allocating RA.

Figure 4
Risk Level Diversification Ratios Using MCTR Method for 75th Percentile Confidence Level

	Pre-Diversified	Post-Diversified	Diversification Ratio
Mortality	0.67	0.07	10%
Longevity	148	94	64%
Morbidity	140	86	61%
Mass Lapse	6	0.15	2%
Lapse	163	96	59%

In this example, the policy level post-diversified RA results as percentages of policy level RA to PV Outgo are similar under the two methods as shown in Figure 5. However, the policy level pre-diversified RA ratio method appears to generate a slightly heavier tail than the MCTR method, which may confirm the MCTR method's ability to reflect risk profiles to match risks represented in mortality, morbidity and lapse outgo. However, operationally the first method could be slightly less complex because only one factor is needed.

Figure 5
Comparison of the Two Methods to Allocate Company Level RA[1]



CONCLUSION

The RA is an important component of the total IFRS liability despite its potentially smaller amount. It represents nonfinancial risk explicitly. It will impact both new business grouping and subsequent measurement. RA allocation directly impacts new business grouping results and also the size of the CSM at issue. Releasing RA in the subsequent measurement is considered a profit driver in the income statement. Therefore, companies will need to decide which approach to use based on their own risk profile and risk appetite alongside with other strategies. Companies will also need to carefully calibrate the shocks for the RA calculation if they use the confidence level approach. This article demonstrated some approaches and available methods but there are other generic areas to address such as discount rates, correlation matrices, and so on.

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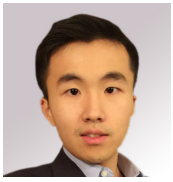

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ENDNOTES

1 A product has multiple policies with similar specifications.