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GAAP Targeted Improvements—Universal Life Contract Analytics

By Steve Malerich and Charles Tsai

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Chairperson's Corner: Turn the Page

By Dave Armstrong

The Society of Actuaries (SOA) Annual Meeting & Exhibit marks the transition in leadership of the SOA and the respective sections for the upcoming year, and I am honored to have been selected to assume the role of chair of the Financial Reporting Section Council. I am proud and humbled to add my name to the list of esteemed colleagues and friends who preceded me. The change in leadership of the council for the new year is marked by the passing of the infamous green jacket, and with it came the opportunity for me to make a bold fashion statement while in Toronto. I would like to thank the outgoing chair, Simpa Baiye, for his leadership over the past year, his years of service to this and other professional sections, and his support during transition. In addition to Simpa, two other members of the council rolled off as their terms ended in October. Thank you to Katie Cantor and Steve Finn for your dedication, hard work and contribution of your time over the past three years.

Three new members were elected to three-year terms on the council during the section elections held in August and September. I would like to welcome Eric Chen, Mark Hutchinson and Alex Lemieux to the section council, and I look forward to working with you over the coming year.

To say it is a time of change in life insurance financial reporting is putting it mildly. As a section, we work to bring relevant research, literature and other content to the profession.

NEW TEXTBOOKS

The highlight of the Financial Reporting Section Breakfast at the SOA Annual Meeting & Exhibit was the introduction of the new IFRS textbook. The textbook is the product of substantial work of many volunteers, and we thank you for your contribution. A third edition of the US GAAP for Life Insurers textbook is also in progress, under the direction of co-editors Mark Freedman and Rob Frasca.



THE YEAR AHEAD

- Over the next year, the section will continue to deliver valuable content and opportunities for professional development to our members through a variety of media:
- We are the primary sponsoring section of the Valuation Actuary Symposium, which will be held in New Orleans in 2020. We also sponsor content at the Life and Annuity Symposium and the SOA Annual Meeting & Exhibit.
- We plan to sponsor several webcasts, such as our “2019 Year-End Statutory Financial Reporting Considerations” webcast. These webcasts count as organized activities for continuing education. We are also planning several podcasts for learning on the go.
- Our section website (<https://www.soa.org/sections/financial-reporting/>) contains links to content on IFRS 17, FASB Long Duration Targeted Improvements, and the SOA's Regulatory Web Resource. The Life and Annuity regulatory resource is also maintained by the section council.
- The Section will continue to publish articles and other content of interest to section members, but this will be the last regularly scheduled print edition of *The Financial Reporter*. All

section newsletters will be transitioning to more frequent, electronic delivery in 2020.

RESEARCH PROJECTS

Another important function of the council is the support and sponsorship of research benefiting the profession. We have a number of research projects underway, and a summary of recently completed and current projects may be found at the end of the newsletter.

In closing, our mission is to serve the section membership and the profession. The members of the council are always interested

in ideas for content or new media, and we appreciate your feedback. Please feel free to reach out at any time with ideas or to discuss volunteer opportunities. I look forward to working with the council membership, friends of the council and SOA staff over the coming year! ■



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GAAP Targeted Improvements— Universal Life Contract Analytics

By Steve Malerich and Charles Tsai



Editor's note: The views expressed in this article are those of the authors and do not necessarily reflect the views of the authors' firm.

This is a universal life counterpart to an earlier article, "Traditional Contract Analytics" by Malerich, Scotchie and Winawer, The Financial Reporter, December 2018. That article described the benefits of analytical formulas, benefits that are also available for universal contracts. Where appropriate, this article refers to the earlier article rather than repeating its content.

On Aug. 15, 2018, the Financial Accounting Standards Board (FASB) released Accounting Standards Update No. 2018-12: Targeted Improvements to the Accounting for Long-Duration Contracts.

The updates separate amortization from the emergence of product margins. For universal contracts, this affects the amortization of deferred acquisition cost assets (DAC), deferred sales inducement assets (DSI) and unearned revenue liabilities (URL). Though the updates do not directly alter the calculation of additional liabilities for annuitization, death and other insurance benefits (SOP), the change in URL amortization will affect the calculation of SOP in products with front-end loads and the accrual of SOP will no longer affect amortization of DAC, DSI and URL.¹

Two earlier articles presented exact² and approximate³ formulas that could be used under current standards to help in explanations and controls around changes in universal life accruals of these intangible assets and liabilities. This article describes the 2018 accounting updates and the different methods that will be needed for regular updates of assets and liabilities, and it provides new analytical formulas appropriate for universal contracts.

Under the new standard, amortization will be on a constant level basis without interest accretion. SOP reserves, however, will continue to accrue in proportion to assessments with interest.

Actual cash flows will have no effect on amortization but will need to be included in the recalculation of benefit ratios. Experience variances and assumption changes affecting the projection will require prospective adjustment of amortization rates but retrospective adjustment of SOP.

With these changes, the new standards require three update methods for different circumstances.

- The prospective update method spreads the effect of a change across future income and is required for changes in the expected term. It is also required for amortization of new acquisition expenses, sales inducements and front-end loads. When applied as of the beginning of a period, the method might also be used as a technique for adjusting DAC, DSI and URL for excess terminations.⁴
- The immediate update method applies the full effect of a change to the current balance and may be used to adjust DAC, DSI and URL for the effect of excess terminations. At times, this method might also be used to estimate SOP.
- The retrospective update method allocates a change among past and future income in proportion to the relevant base and is required for updates to the cash flow and discount rate assumptions used in SOP calculations, including assumption changes and true-up for actual experience.

Gains and losses from retrospective remeasurement will be presented in financial reports as of the beginning of the current reporting period and included in net income.

Specific applications of these methods to different conditions, and benefits related to earnings attribution, controls, forecasting and sensitivity testing, and bias avoidance, are explored below.⁵

Sequential or simultaneous application of the calculations discussed in this article to multiple causes of change is partly a matter of necessity, partly of preference.

Sequential measurement is necessary when switching between immediate and prospective DAC, DSI and URL effects and between retrospective and immediate SOP effects. In these situations, specific circumstances will usually dictate which effect to measure first. For sequential measurements, “Prior” amounts in the following formulas will include the effects of changes measured earlier in the sequence and “New” amounts must be measured without the effects of changes measured later in the sequence.

For multiple causes using the same update method, simultaneous measurement is possible. Amounts of each change in the numerators must be calculated separately, but “Prior” amounts exclude all simultaneous changes and “New” amounts include all simultaneous changes.

DAC, DSI AND URL

“Traditional Contract Analytics” included formulas for prospective and immediate DAC changes. The same formulas apply to universal contract DAC. With appropriate substitutions, they also apply to DSI and URL. For DSI, “New Inducement” replaces “New Expense” and a sales inducement amortization rate (k^S) replaces the expense amortization rate (k^E). For URL, “New Load” replaces “New Expense” and a revenue amortization rate (k^R) replaces k^E .

Since the traditional article was written, FASB has indicated that other techniques to adjust DAC for excess terminations are possible and that adjustment for reduced terminations is also permitted (as long as the adjustment does not reverse amortization recorded in a prior period).⁶ The immediate update method and the prospective update method (if applied at the beginning of a period) both satisfy the requirement to adjust for excess terminations.⁷

ADDITIONAL LIABILITIES

The updates do not directly change the requirements for calculating SOP reserves. Updated standards will continue to require:

- Regular review of cash flow assumptions and update of assumptions when appropriate;
- Regular review of the discount rate (contract rate) assumption and update of the discount rate when appropriate—except

for cohorts where the company chose to lock in the discount rate at inception;

- Recalculation of the benefit ratio using actual cash flows in place of expected cash flows; and
- Retrospective update of the liability for actual cash flows and assumption changes.

The updates will, however, affect SOP calculations in two ways:

- The effect of retrospective updates must be presented (and therefore measured) “as of the beginning of the current period ...” (944-40-45-1).
- The DAC changes will affect the amount and timing of the reserve accrual basis (assessments) when URL amortization is part of that basis.

Retrospective Updates

Changes in assumptions and true-up for actual cash flows require retrospective updating of the benefit ratio and SOP as of the beginning of the current reporting period.⁸ A historical ratio is used in formula [1] and defined in formula [3]. This measures the age of the business and matches a portion of the update to past revenue.

$$[1] \Delta SOP = \frac{[\Delta PV(Benefits) - b_{Prior} \times \Delta PV(Assessments)]}{\times b_{New} (Assessments)}$$

$$[2] \Delta b = \frac{[\Delta PV(Benefits) - b_{Prior} \times \Delta PV(Assessments)]}{AV(Assessments) + PV_{New} (Assessments)}$$

$$[3] b_{New} (Assessments) = \frac{AV(Assessments)}{AV(Assessments) + PV_{New} (Assessments)}$$

Where:

- ΔSOP is the change in the SOP reserve;
- $\Delta PV(Benefits)$ is the change in the present value of expected excess benefits;
- b_{Prior} is the benefit ratio from the prior valuation;
- $\Delta PV(Assessments)$ is the change in the present value of expected assessments;
- Δb is the change in the benefit ratio;
- $AV(Assessments)$ is the accumulated value of actual assessments collected since issue; and
- $PV_{New} (Assessments)$ is the present value of all expected future assessments in the new projection.



Since GAAP considers the use of actual experience to be part of an assumption update, these present value changes must also include variances from expected experience. How actual variances affect the update depends on the timing of the true-up measurement.

- If the immediate update method (described later) was used in prior periods, variances since the most recent retrospective true-up are accumulated to the beginning of the current reporting period. In addition to the result of formula [1], the current liability true-up will include (i) immediate release of the accumulated variance from expected benefits and (ii) immediate accrual of the new benefit ratio multiplied by the accumulated variance from expected assessments.
- Otherwise, current variances are discounted to the beginning of the current reporting period, with normal release and accrual in the current period then treating the variances as if they were expected.

Except for matching a portion of the change to past revenue, accomplished by the historical ratio, formula [1] is identical to the immediate method's formula [5], where 100 percent of the change is applied immediately to the reserve.

Adverse and Favorable Trends

If assumptions go unadjusted for actual trends that differ from underlying assumptions, retrospective updates will cause a gradual change in the benefit ratio. Since changes in the benefit ratio

push the reserve in the opposite direction, the drift in the ratio will create bias in the reserve. As bias accumulates, potential for a future assumption change grows. By the time the trend is recognized, the accumulated bias can become large.⁹

The following simple measure, with zero representing the time when current assumptions were set, can provide warning.

$$[4] \text{ Accumulated True Up} = (b_{New} - b_0) \times PV_{New} (\text{Assessments})$$

The accumulated amount over an extended time period may signal a need to update assumptions and may provide a rough estimate of the potential effect from an assumption change.

To reduce assumption update volatility caused by accumulated bias, "Traditional Contract Analytics" included formulas to adjust projected claims for an extrapolation from actual claims. The same formulas can be used for universal contracts.

Immediate Updates

Subtopic 944-40 defines SOP reserves as an accumulation of past net assessments (benefit ratio times assessments) minus past excess benefits. Sometimes, however, the information available for calculating the benefit ratio may be insufficient. If, for example, there is evidence in actual experience that future experience is likely to be better or worse than expected but the evidence is not yet sufficient to support an assumption change, then applying the accumulation formula to actual experience without adjusting projected experience¹⁰ will move the resulting reserve

in the opposite direction suggested by emerging experience. An adverse trend will produce a lower reserve, a favorable trend will produce a higher reserve, and both raise the likelihood of a large reversal when the assumption is eventually updated.

At such times, applying the prospective reserve formula (present value of benefits minus present value of net assessments) but with a fixed benefit ratio can avoid the misleading effects of accumulating actual experience without adjusting projected experience. In effect, this compensates for over or under accumulation of net assessments through an over or under release of reserve to offset the claim variance.

This technique produces an immediate update of SOP as of the end of the current reporting period, with no effect on the benefit ratio.

$$[5] \Delta SOP = [\Delta PV(Benefits) - b_{Prior} \times \Delta PV(Assessments)]$$

$$[6] \Delta b = 0$$

Where formula elements are as defined before, except:

$\Delta PV(Benefits)$ is the change in the present value of expected excess benefits (excluding expected change for the passage of time); and

$\Delta PV(Assessments)$ is the change in the present value of expected assessments (excluding expected change for the passage of time).

With an unchanging benefit ratio, formula [5] looks much like a normal reserve formula—the present value of future benefits minus the present value of future net premiums. Under the immediate update method, incremental present values translate directly into an incremental reserve.

COMPLICATIONS OF INCONSISTENT ACCOUNTING FOR URL AND SOP

Current standards include a circular dependency between amortization of URL and accrual of SOP. The updates eliminate this circularity but create inconsistencies in accounting for these two liabilities.

- Amortization of URL cannot include provision for expected future front-end loads, but SOP calculations must include expected future amortization.
- URL cannot increase with interest, but SOP requires discounting of assessments, including URL amortization.

- URL requires prospective unlocking for assumption changes and an adjustment for excess terminations, but SOP requires retrospective unlocking for assumption changes and for actual experience different from expected.

One other complication carries over from current standards—assessments exclude a direct charge (front-end loads) and include a GAAP accrual (URL amortization). To tie these analytics directly to product performance, we define “cash assessments” to include front-end loads but exclude amortization. For any given reporting period:

$$[7] Assessments = Cash\ Assessments - Front\ End\ Loads + URL\ Amortization$$

We express assessments as a function of cash assessments because that is the order in which they are developed.

Expected Future Front-End Loads

The formulas presented in this article will work equally well regardless of whether projected assessments include or exclude future amortization on expected future front-end loads. The results, however, can vary significantly.

If projected assessments do not include amortization of expected future loads, then every new load will produce a true-up adjustment to SOP. If projected assessments do include future amortization of expected future loads, then SOP will require a true-up adjustment only for variations from expected future loads.



Discounting of Projected Assessments

The absence of interest on URL means that the present value of amortization will not equal the present value of front-end loads. To link the present value of assessments in the above formulas to cash flow projections would result in complex formulas that are not conducive to simple explanations.

Though the effect of discounting amortization can be significant, it is likely that discounting of changes in projected amortization will be insignificant compared with other effects of cash flow and persistency variances. (Large changes in projected loads or amounts in force may be exceptions.) Substituting the change in present value of cash assessments for the change in present value of assessments, formulas [1] through [3] and formula [5] become the following approximate formulas.

For retrospective updates:

$$[8] \Delta SOP \approx [\Delta PV(\text{Benefits}) - b_{\text{prior}} \times \Delta PV(\text{Cash Assessments})] \times b_{\text{New}} (\text{Assessments})$$

$$[9] \Delta b \approx \frac{[\Delta PV(\text{Benefits}) - b_{\text{prior}} \times \Delta PV(\text{Cash Assessments})]}{[AV(\text{Assessments}) + PV_{\text{prior}} (\text{Assessments}) + \Delta PV(\text{Cash Assessments})]}$$

$$[10] b_{\text{New}} (\text{Assessments}) \approx \frac{AV(\text{Assessments})}{[AV(\text{Assessments}) + PV_{\text{prior}} (\text{Assessments}) + \Delta PV(\text{Cash Assessments})]}$$

For immediate updates:

$$[11] \Delta SOP \approx [\Delta PV(\text{Benefits}) - b_{\text{prior}} \times \Delta PV(\text{Cash Assessments})]$$

Inconsistent Update Methods

Under current standards, the effects of true-up and unlocking for URL and SOP could be combined into a single formula to explain the retrospective effect of variances and assumption changes on current earnings. The updates, however, force URL

and SOP into different update methods, making it necessary to evaluate them separately. ■



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ENDNOTES

- 1 The updates did add a reference to indicate that any general account interest margin included in assessments means only the margin earned from investing assets to back the policyholder account balances. For companies that included in assessments the amount of interest margin on SOP reserves as well, this margin must be removed from future SOP calculations. This change does not affect the formulas in this article except as a modification of the input, "assessments."
- 2 Malerich, Steve. Revisiting FAS 97's Management Potential. 2008. *The Financial Reporter*, June.
- 3 Malerich, Steve. Simply Unlocking. 2015. *The Financial Reporter*, June.
- 4 Amortization over expected term may be performed either on an individual contract or a grouped contract basis. Calculations in this article apply most naturally to the grouped contract approach.
- 5 Space limitations do not allow us to show derivations of the formulas in this article. To get a copy of the derivations, contact one of the authors.
- 6 *IN FOCUS: Accounting Standards Update on Insurance* webcast, November 15, 2018.
- 7 The immediate update method has been a common practice for seriatim DAC calculations since publication of the AICPA's "Audits of Stock Life Insurance Companies" in 1972.
- 8 Using prior present values in the denominators of formulas [2] and [3] would usually produce good approximations. For controls or sensitivity testing, the prior projection would have the added benefit of making the historical ratios (formula [3]) independent of the new projection.
- 9 Malerich, Steve. Retrospective Noise. 2017. *The Financial Reporter*, September.
- 10 Malerich, Steve. Unlocking 2.0. 2017. *The Financial Reporter*, December.

GAAP Accounting for FIAs When Living Benefits Are Present

By Heather Gordon

Fixed indexed annuity (FIA) financial reporting can be challenging, as it deviates from traditional liability views. This article will go over the basics of GAAP accounting for FIAs with riders addressing how rider charges should be considered when determining fair value and how this might translate over to SOP 03-1 and Market Risk Benefits (MRBs) when ASU 2018-12 becomes effective.

FIAs can be considered a fixed annuity (FA) with an equity “kicker,” linking account accumulation to the performance of an index like the S&P 500. Increasingly, FIA writers have been attaching riders to these products—the majority being living benefit riders with an associated contractual “fee.” FIAs are spread products, so money is not exchanged between the company and the policyholder except premium and decrements. Value is accrued, including any revenue associated with rider fees.

FIAs fall under ASC 815 (FAS 133) and ASC 820 (FAS 157). ASC 815 identifies derivatives, both stand-alone and embedded in a nonderivative contract, and in some cases requires them to be held at fair value. An embedded derivative (ED) needs to be

bifurcated from its host (nonderivative) contract and held at fair value, with changes in fair value going through earnings. Once the ED is separated from the host, the host is accounted for under the same GAAP rules as a policy that does not contain an embedded derivative (ASC 815-15-25-24). ASC 820 gives guidance on how to determine fair value where fair value is an exit price and not a reserve although, depending on the liability, it might look a lot like a reserve.

The GAAP balance sheet for an FIA is very similar to that for an FA. Although FIAs include a split between host and embedded derivative, the total FIA liability can be viewed as a traditional FA account value, with a fair value adjustment indicating the options are worth more or less than when purchased, like a parenthetical view described in ASC 815-15-45-1.

Look at the liability from a simple lens and agree with its value before complicating it. In fact, ASC 815-15-30-4 cautions that artificial terms shouldn’t be created “to introduce leverage, asymmetry, or some other risk exposure not already present in the hybrid instrument.” Taking the most granular view produces consistent results across frameworks, and terms that would skew the value without explanation should not be included.

Since FAs and FIAs are subject to standard nonforfeiture law (SNFL), they can be broken down between SNFL and credited interest above SNFL. In Table 1, SNFL terms are 87.5 percent of premium growing at 1 percent. Assuming no decrements and assuming the discount rate is the same as the credited rate, the policy can be split between a guaranteed amount and an amount at the company’s discretion. Host plus Excess (XS) at each period equals the account value, and the cost of funds (COF) is identical to interest credited on a regular FA. Host accretion rate (HAR) is the rate at which host will accrue each period, which is equal to the growth rate and discount rate in this example.

Table 1
Traditional FA Broken Down Into Elements

Year	Av	Guaranteed	Excess Credits	Host	Excess	COF		
						Host	Excess	Total
0	100,000	87,500		79,290	20,710			
1	102,000	88,375	13,625	80,876	21,124	1,586	414	2,000
2	104,040	89,259	14,781	82,494	21,546	1,618	422	2,040
...								...
10	121,899	96,654	25,245	96,654	25,245	1,895	495	2,390
	HAR	2.00%						

Table 2
Breakdown With Decrements

Year	AV	Guaranteed Value	Excess Credits	Lives	Mortality	Lapse	Discount		Expected At Issue				
							Host	ED	Host	Excess	COF		
											Host	Excess	Total
0	100,000	87,500		1.00000			1.00000	1.00000	80,930	19,070			
1	102,000	88,375	13,625	0.94953	0.0005	5%	0.98039	0.98039	78,088	18,763	1,619	381	2,000
2	104,040	89,259	14,781	0.90115	0.0010	5%	0.96117	0.96117	75,332	18,424	1,562	375	1,937
...													...
10	121,899	96,654	25,245	-	0.0050	100%	0.82035	0.82035	-	-	1,168	305	1,473
	HAR	2.00%											

Premium received by the policyholder represents a \$79,290 investment in guarantees and a \$20,710 investment in potential excess crediting. Decrements, as demonstrated in Table 2, will shift value between the initial host and excess investment, but initial host balance accrues at the same rate of 2 percent.

ASC 820 asks for a projection in order to arrive at an account “value” and not a projection of account value, which is different from deferred acquisition costs (DAC) and SOP 03-1, which use a projection of account value to get revenue and benefit streams over the life of the contract. The projection of account value is needed to estimate the revenue patterns and the claims patterns. Similarly, ASC 820 for a variable annuity contract with a guaranteed minimum withdrawal benefit (GMWB) would need a projection of account value in order to get the fee streams expected to support the claim stream. If the index credit fair value is treated as a projection of account value rather than a projection to establish today’s value, there might be something in the calculation that should not impact today’s value at all. Partial withdrawals, for example, shouldn’t be introduced because they don’t lead to claims above guarantees since the SNFL is reduced dollar for dollar with the account value. Although partial withdrawals affect future index credits, this has nothing to do with today’s fair value. Keep in mind that the host rate and host balance represent the expense of the guarantees in the contract, so if a company is changing that from one policyholder to another, it’s important to understand why.

In the undecrement projection, if the guaranteed account value and account value are reduced by a 10 percent free partial withdrawal every year, the initial host investment would be \$82,564

and the initial excess investment would be \$17,436. However, the host would “accrue” to a low ultimate value of \$22,184, resulting in a negative host accretion rate (-12.32 percent). This makes very little sense. Even with a less extreme 1 percent partial withdrawal per year, the host accrual rate is 0.73 percent.

Unless units (lives) are impacted, risk may be introduced that doesn’t exist in the hybrid instrument. If partial withdrawals are reducing guaranteed value proportionally and, hence, generating excess index credits, risks may be introduced that don’t exist in the hybrid instrument. This is not to necessarily say it is incorrect to do so; just understand its impact at this very basic level before adding the calculation complexities that mask these dynamics.

What about GMWB riders and fees associated with them? Recall, there is no other exchange of money except on surrender, and the accounting should also reflect that. If rider fees are being booked explicitly to a revenue account, there should be an offsetting benefit transaction. Going back to a fixed annuity where the liability is very simple to understand, the accounting for a \$950 rider fee (with debits and credits) would be as follows:

Income Statement:	
CR Rider Fees	(\$950)
DR Benefit Withdrawal	\$950
CR Change in Reserve	(\$950)
Balance Sheet:	
DR Change in Reserve	\$950

Figure 1
Cost of Funds With and Without Fees Projected

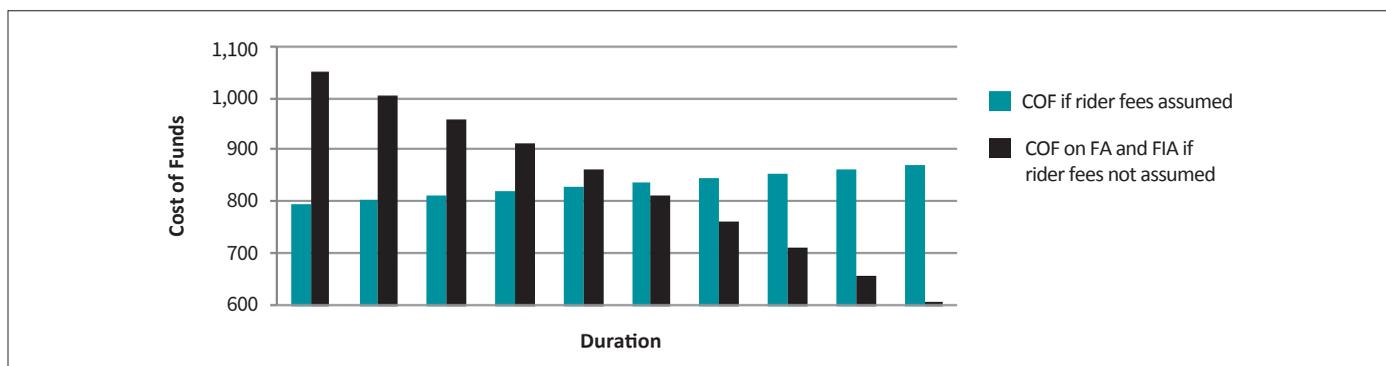


Table 3
Rider Fees in the Value Equation

Year	GMWB Base	AV	Guarantee	Excess	Rider Fees	Values over time						
						Host	Excess	Rider Fees	GAAP Reserve	GAAP - AV	COF Realized	COF Expected
0	100,000	100,000	87,500			79,290	9,586	11,124	100,000	-		
1	107,000	101,050	88,375	12,675	950	80,876	9,777	10,396	101,050	-	1,050	1,050
2	114,000	102,055	89,259	12,796	1,986	82,494	9,973	9,588	102,055	-	1,005	1,005
3	121,000	103,013	90,151	12,861	3,108	84,144	10,172	8,697	103,013	-	958	958
4	128,000	103,923	91,053	12,870	4,320	85,826	10,376	7,721	103,923	-	911	911
5	135,000	104,786	91,963	12,822	5,622	87,543	10,583	6,659	104,786	-	862	862
6	142,000	105,599	92,883	12,716	7,017	89,294	10,795	5,510	105,599	-	813	813
7	149,000	106,362	93,812	12,550	8,507	91,080	11,011	4,271	106,362	-	763	763
8	156,000	107,074	94,750	12,324	10,092	92,901	11,231	2,941	107,074	-	712	712
9	163,000	107,733	95,697	12,036	11,776	94,759	11,456	1,518	107,733	-	659	659
10	200,000	108,339	96,654	11,685	13,560	96,654	11,685	-	108,339	-	606	606
		HAR	2.00%									

Table 4
Varying Discount Curves

Year	At Issue			Actual Liability				Actual COF by Source				Change In Fair Value	XS IRR
	AV	Guarantee	Excess over Gtee	Account Value	Host	Excess	Total	Host	XS	Rider Fees	Total		
0	100,000	87,500		100,000	81,115	18,885	100,000						
1	102,000	88,375	13,625	101,050	82,413	18,462	100,875	1,598	402	(950)	1,050	(175)	2.25%
2	104,040	89,259	14,781	102,055	83,756	18,193	101,949	1,624	397	(1,017)	1,005	70	2.21%
...													
10	121,899	96,654	25,245	108,339	96,654	11,685	108,339	1,868	287	(1,549)	606	(27)	0%
		HAR	1.97%									(0)	

It is the author's opinion that ASC815/ASC820 is the same regardless of the riders attached to the policy. The features associated with those riders will always be captured within the framework intended ...

The company is just earning additional spread and not “charging” a fee, so it comes through as lower net COF. For example, in year 1, premium of \$100,000 earns \$2,000 in index credits and then \$950 is “paid” in fees, leading to a net COF of \$1,050.

Historically, rider fee treatment has been a concern since it could impact surplus. This is because there is no reserve release for rider fees since fair value calculations are prospective, but the fair value calculation is not a reserve, so it doesn't need to release anything. The calculation is prospective based on today's account value, and anything reflected in today's account value will also be reflected in today's account “value.” The liability will release them unless the calculation takes credit for something today not yet received. Using the simplified host and XS split with consistent economics and no decrements, cost of funds should not be any different from a fixed annuity but, depending on how fees are treated, cost of funds may be impacted in unintended ways. Figure 1 (pg. 12) shows there is a different pattern of net COF depending on whether fees are projected.

HAR is reduced since value of the excess has dropped and the initial investment in the host has increased. The guaranteed value is unchanged since SNFL isn't reduced for rider fees. This means a policyholder has to invest more to get the same guarantee at the end of 10 years by adding the rider. The liability at time 1 should equal the account value given the economics are the same between host and excess. However, by reducing the account value projection for fees, the calculation is fronting the rider fees, taking credit today for something to be received in the future. Interest credits aren't realized in the future because value shifted to the company, not because they didn't have as much value. That value should be tracked for the math to work as shown in Table 3 (pg. 12).

The solution is to ignore rider fees in the projection, and rider fees will be captured in the starting account value. This is supported by ASC 815-15-25-10 when an embedded derivative (GMWB being a put option against the company) is clearly and

closely related to the host contract and, therefore, doesn't require bifurcation.

Under this logic, if a policyholder were to drop the rider, there would be a large increase in COF to “pay back” the rider fees the company took credit for at inception due to the large decrease in the ED. This shouldn't happen since the only relief to the company should be a lower SOP reserve accrual, which is the framework that accounts for the rider risk (or MRB release under ASU 2018-12). When rider fees are ignored, it makes no difference if the rider is dropped as expected, even when decrements are layered on.

Once all the appropriate decrements are in the calculation, the complexity can be layered on. Assume the risk-free rate is 3 percent in the first year and 2 percent thereafter. As can be seen in Table 4 (pg. 12), now the XS portion has a higher IRR (2.12 percent), which decreases the initial XS investment and increases the initial host investment, accruing at a slightly lower rate.

At the end of year 1, there's a negative fair value adjustment because the XS IRR increases to 2.25 percent due to the yield curve shift.

As shown, there is no surplus problem since the liability will always be released for rider fees. DAC, SOP 03-1 and, eventually, MRBs are attempting to value completely different things and should be considered separately. The index credit fair value is a projection to arrive at the current base contract liability value, or an exit price should the policyholder terminate the agreement. DAC, SOP 03-1 and MRBs take this starting account value and project how it changes over time, as it impacts revenue, expenses and rider claims the same way a fixed annuity or variable annuity account value is the starting point in those calculations.

CONCLUSION

It is the author's opinion that ASC815/ASC820 is the same regardless of the riders attached to the policy. The features associated with those riders will always be captured within the framework intended, and if those features are not deemed an embedded derivative that must be bifurcated from the host, they should be ignored in the embedded derivative calculation. In doing so, the balance sheet and income statement are in alignment. For more detailed information regarding this treatment and the stacking of fair value elements, please feel free to reach out to the author. ■



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An Alternative Option-Based Approach to Calculating MRBs

By John Adduci

ASU 2018-12 introduced a new concept called “market risk benefits” (MRBs). MRBs are a new accounting classification for benefits within deposit contracts, offering protection from “other than nominal market risk.” This applies to products with account values, including variable and indexed annuities with guaranteed living or death benefits attached (aka GMxBs).

ASU 2018-12 Section 944-40-30-19D mentions both a non-option and an option-based valuation approach to account for MRBs. This article considers the option-based approach. The purpose is to highlight weaknesses in the current application of the option approach to MRBs, propose an alternative method, and consider the benefits of the new approach.

CURRENT OPTION-BASED APPROACH

Consider a fixed indexed annuity (FIA), with money invested in both indexed and fixed funds. The FIA has a guaranteed minimum death benefit (GMDB) rider attached with no explicit fees. The benefit is subsidized by less generous accumulation parameters (such as credited rates and caps). The GMDB under ASU 2018-12 is an MRB. Under current GAAP practice, the reserve on the base contract at issue is fixed fund value plus host plus value of embedded derivative (VED), where the initial host is equal to indexed premium less VED to avoid a gain or loss at issue. The reserve for the GMDB is held under SOP 03-1 and is zero at issue.

Since the GMDB is considered an MRB under ASU 2018-12, it must be fair valued. The company investigates an option-based approach. Using current GAAP guidance, the present value (PV) of excess benefits on the GMDB rider must be subtracted from the premium to establish the host at issue as follows:

- $MRB = PV \text{ of future excess benefits at issue}$
- $Host = fixed \text{ premium} + indexed \text{ premium} - VED - MRB$
- $Total \text{ Contract Reserve} = Host + VED + MRB$

The total contract reserve is the initial premium; there is no gain or loss at issue. At future dates, the host accrues at an internal rate of return (IRR) to the ultimate policy guaranteed minimum surrender value.

The Problem Part 1

But wait ... what happened to the reserve on the fixed fund? Instead of being held equal to the account value, it is included along with indexed funds in the host! This is required because the MRB is based on all policy funds, not just indexed funds. The option approach requires that the **entire contract** be revalued at inception to establish a new host; the new host will accrue at the IRR to the transition date. This change can significantly impact the balance sheet.

The Problem Part 2

Now consider what happens to the GMDB if there is good performance on indexed funds. Positive fund performance results in less excess benefits and thus less value in GMxB riders. Under the existing option-based approach, the host was reduced to avoid a gain/loss at issue. If after several years the MRB (PV of future excess benefits) is reduced, the host will be lower than an otherwise identical contract without a GMDB because the host at time 0 was lower. The counterintuitive situation occurs where a contract with a GMDB rider will have a lower total reserve at a future date than it would have had if the GMDB rider was never attached.

Under current GAAP, the base contract reserve is unaffected by the SOP 03-1 reserve. Under the current option-based approach, the base contract reserve very much depends on the presence of the rider. This undesirable change to the base reserve is not currently addressed by the option-based approach.

Why Bother?

You may be wondering “Why would a company ever want to use the option approach? Considering potential changes to the base reserve and increased volatility, what’s the upside?” Two reasons why a company would consider calculating MRBs using the option approach:

1. **No explicit rider fees/avoid a loss at issue:** If you have GMxB riders without explicit fees, then the nonoption approach results in a loss at issue. This situation can happen if the rider benefits are offset by implicit fees, such as reduced caps on an FIA, or higher M&E fees on a variable annuity (VA).
2. **Another choice:** At transition, a company may test both approaches and select the methodology with the most desirable results. The option approach provides this second choice.



ALTERNATIVE METHOD: OPTION APPROACH TO MRB

Considering the issues above, let's consider an alternative method for calculating the MRB liability. This alternative approach may not be accepted practice today but has significant advantages over the current approach.

The process described below sets up a separate "host" balance equal to the opposite of the MRB liability (PV of excess benefits – PV of fees, if any) at issue. The new "host"—call it "host2"—amortizes to zero over the contract life. The MRB plus host2 equals the net liability for the MRB.

At issue, calculate the present value of excess benefits and present value of rider fees (if any) across a range of appropriate scenarios. Establish an MRB at issue equal to average PV of excess benefits less average PV of fees. The present values are discounted at the scenario-specific discount rate and then averaged across all scenarios to calculate the MRB. Next, establish a host2 equal to and opposite the MRB at issue. The net liability is equal to the MRB liability plus host2 liability, which at issue is zero.

Host2 Liability

The host2 established at issue must now be rolled forward to the valuation date.

Roll forward: Once the host2 at time 0 is established, one method for rolling forward to the valuation date is straight-line amortization from the issue date to maturity. The method of rolling forward host2 to policy maturity is the only difference between the current option approach and this new approach for

policies with an established host liability. Rolling forward the host2 balance using straight-line amortization is consistent with ASU 2018-12's simplified approach to DAC amortization and is applicable for policies with or without an underlying host on the base contract, making it a logical choice.

New premium/partial withdrawals: The host2 liability established at time 0 needs to be adjusted for new premium and partial withdrawals on the base contract. To make this adjustment for new premium, the host2 is ratioed upward. The host2 is ratioed downward for partial withdrawals. The suggested ratio will use the concept of historical premiums paid to date.

Historical premium paid: Historical premium paid is equal to the initial contract premium, plus additional premium, minus partial withdrawals. Adjust the host2 at time 0 based on this value so that we can amortize the host2 to 0 when the fund value has run out.

Example: Calculating the host2 value at time t: Assume that initial premium is \$100K, host2 at time 0 is negative \$10K, there's an additional \$50K premium at first anniversary, and a partial withdrawal of \$40K is taken in the fifth year, when the account value is \$200K (prior to withdrawal). The historical premium after all transactions as of the fifth anniversary is calculated as follows:

- Historical premium paid (at t=0) = \$100K
- Historical premium paid (at t=5) = $(\$100K + \$50K) * (1 - \$40K/\$200K) = \$150K * 0.8 = \$120K$

Use the historical premium paid to ratio the host2 balance at time 0. The host2 at issue was $-\$10K$. The new host2 after accounting for additional premiums and partial withdrawals is $-\$10K * \text{historical premium (5)} / \text{historical premium (0)} = -\$10K * (\$120K / \$100K) = -\$12K$.

To determine the host2 liability at the valuation date, use straight-line amortization. For this example, assuming a time to maturity of 50 years, the host2 (5) = $\text{host2 (0)} * (\text{time to maturity} / \text{total contract life}) = -\$12K * (45 / 50) = -\$10.8K$. The general formula is $\text{host2 (t)} = \text{host2 (0)} * (t / 50)$ for this contract.

This method is not perfect. There is a disconnect between straight-line amortization of host2 and the payment of excess benefits. Another method would be to establish host2 (0) as above and amortize the time zero balance using historical premium paid, essentially making host2 a DAC-type asset similar to a sales inducement asset.

Market Risk Benefit Liability

To calculate the MRB post-issue, the model must first be updated to reflect the current market. The MRB liability is calculated

Figure 1
MRB Balance Under Option Approach: Current vs. Proposed

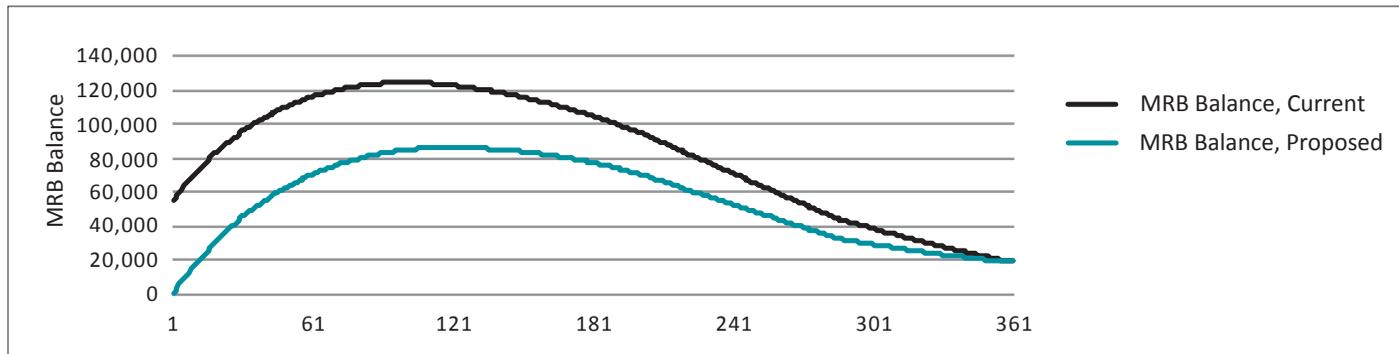
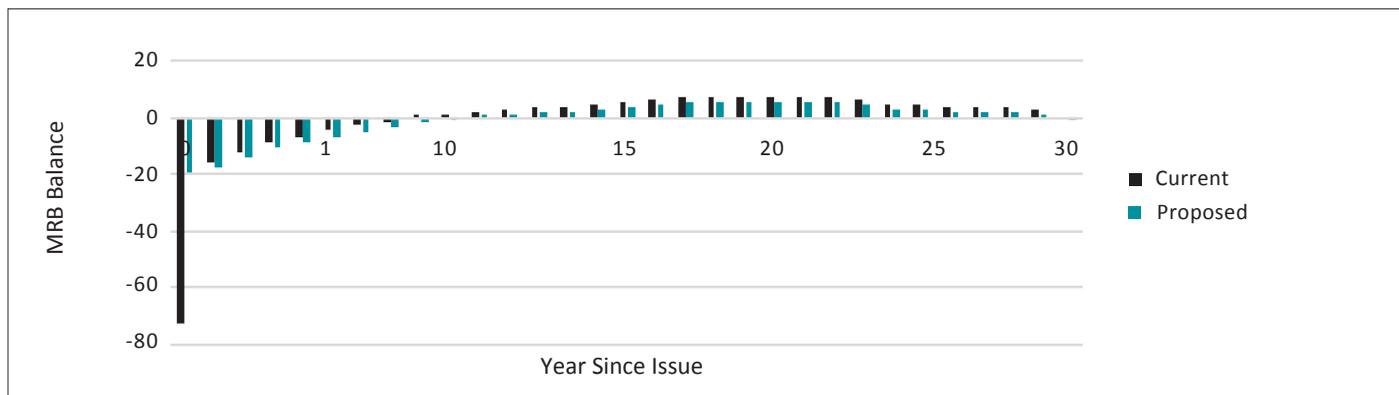


Figure 2
Annual Income Under MRB Option Approach: Current vs. Proposed



in exactly the same manner that it was calculated at time zero. The calculation of MRB at time t is prospective with MRB (t) equal to the average PV of excess benefits across scenarios less the average PV of fees (if any) across scenarios.

Net Liability

The new host2 (t) uses straight-line amortization from time 0 to time t as described above. The MRB (t) is a prospective calculation done using updated assumptions and in force. At time t , the net liability for the MRB using the option approach is $host2(t) + MRB(t)$. Note that after time zero, this value may be positive or negative.

Graphical Comparison

The graphs in Figures 1 and 2 demonstrate the pattern of results. The underlying product is an annuity with a GMDB, without any rider fees. Figure 1 illustrates that using the current method, there is an immediate loss, while the proposed method has no gain or loss at issue. The proposed method has a lower

MRB at every point due to the host2 asset while maintaining a similar pattern of reserve accrual.

Figure 2 plots annual income over time. The current method includes a loss at time zero. At each point after time zero, the current method has a higher annual income than the proposed method. Beginning in year 8, the annual income using the current approach becomes positive. Under the proposed method, the flip from negative to positive income due to the MRB occurs later, in year 10.

This alternative method has the following benefits:

1. **No impact to base contract reserve at transition:** For fixed and variable funds, the base contract benefit reserve will remain the fund value.
2. **Reserve at issue is equal to current method:** Establishing “host2” as a separate liability is equivalent to including it in the base contract FAS 91-style host on an FIA. The only

difference is how host2 is amortized or accrued from time zero to maturity.

3. **The option-based approach can now be applied to all products:** It can apply to products whether or not they have explicit rider fees, an existing host contract, funds in both separate and general accounts, etc.
4. **Auditable and intuitive:** Since the MRB calculation is not tied to the host portion of the base contract reserve, the policy-level calculations become easier to audit and more intuitive.
5. **Lower volatility:** Variable and fixed fund reserves remain at account value instead of host plus VED, lowering volatility due to VED fluctuation.
6. **No loss at issue:** There is no loss at issue for any policies.
7. **Better fit for awkward contracts:** There is better application to contracts that are otherwise “awkward” under fair value. Consider a VA with a GMDB but without rider fees. Since it’s a variable annuity, there is no host. Therefore, you can’t use the current option approach. However, there are

no explicit fees, so you can’t use the non-option approach without incurring a loss.

CONCLUSION

The purpose of this article is to highlight the shortcomings of the current option-based approach and describe a better method for implementing MRBs. The alternative method sets up a “host2” at issue, which is then written down over the life of the policy. The net liability for the MRB becomes host2 plus MRB, with no changes to the base contract reserve. This new alternative method is not consistent with the way that the option-based approach is used in either the insurance or the banking industry, where practice is well established. However, the MRB is a new accounting classification under ASU 2018-12, and now is the ideal time to consider a new approach. The many advantages of the proposed method over the currently accepted method make this an alternative worth considering. ■



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Implementation and Modeling Emerging Practices for Life PBR

By Kevin Carr II, Simon Gervais, Haley Jeorgesen and Chris Whitney

Mandatory implementation of life principle-based reserves (PBR) is just around the corner, and there is no shortage of work to do, as most products have yet to be moved to PBR.

Oliver Wyman recently completed its 2019 PBR survey, with more than 40 participants covering 85 percent of the individual life market, including 23 of the top 25 life writers and five reinsurers.

This article will expand on the key survey findings shown in Figure 1 related to implementation status and model simplifications.

PBR IMPLEMENTATIONS ARE HEAVILY BACK-LOADED
Figure 2 (pg. 19) shows actual PBR implementations through 2018 and planned implementations through the remainder of the optional implementation period.

Figure 1
Key Findings From the 2019 Oliver Wyman PBR Emerging Practices Survey

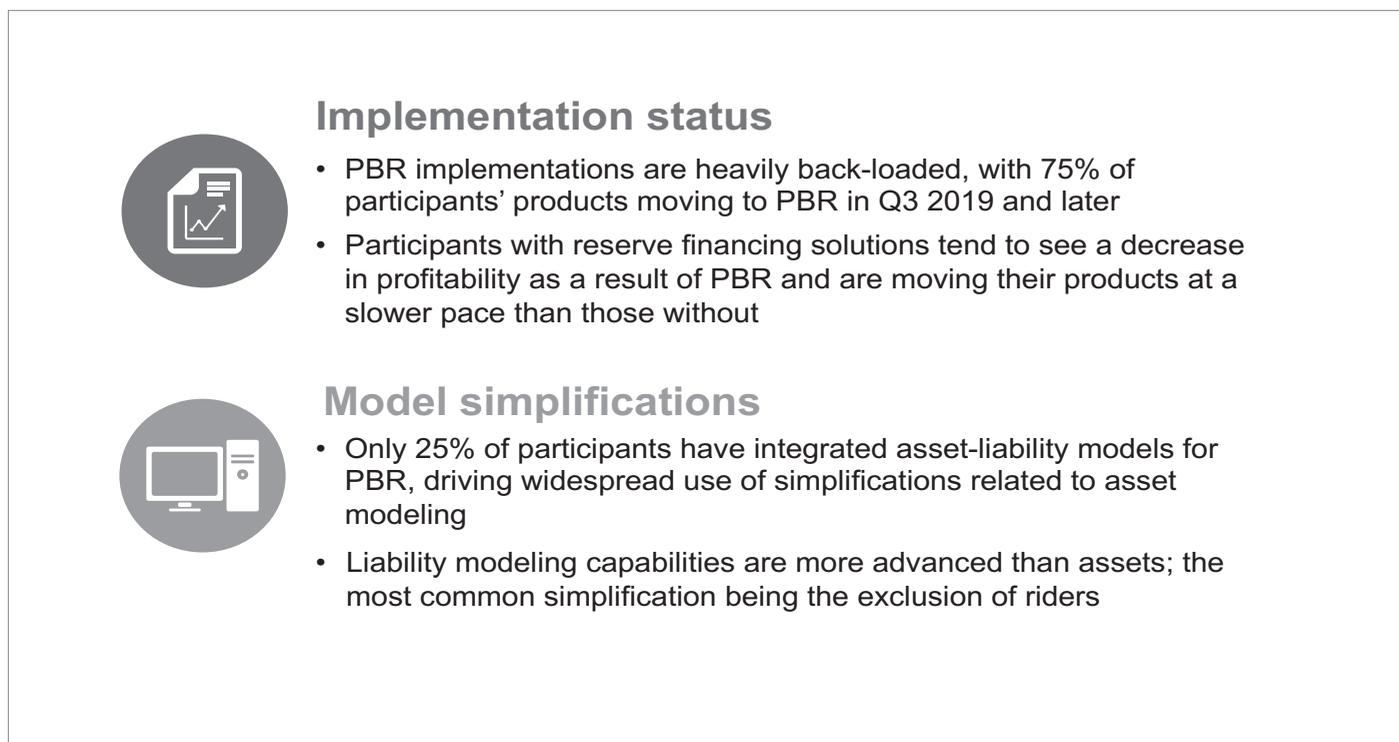
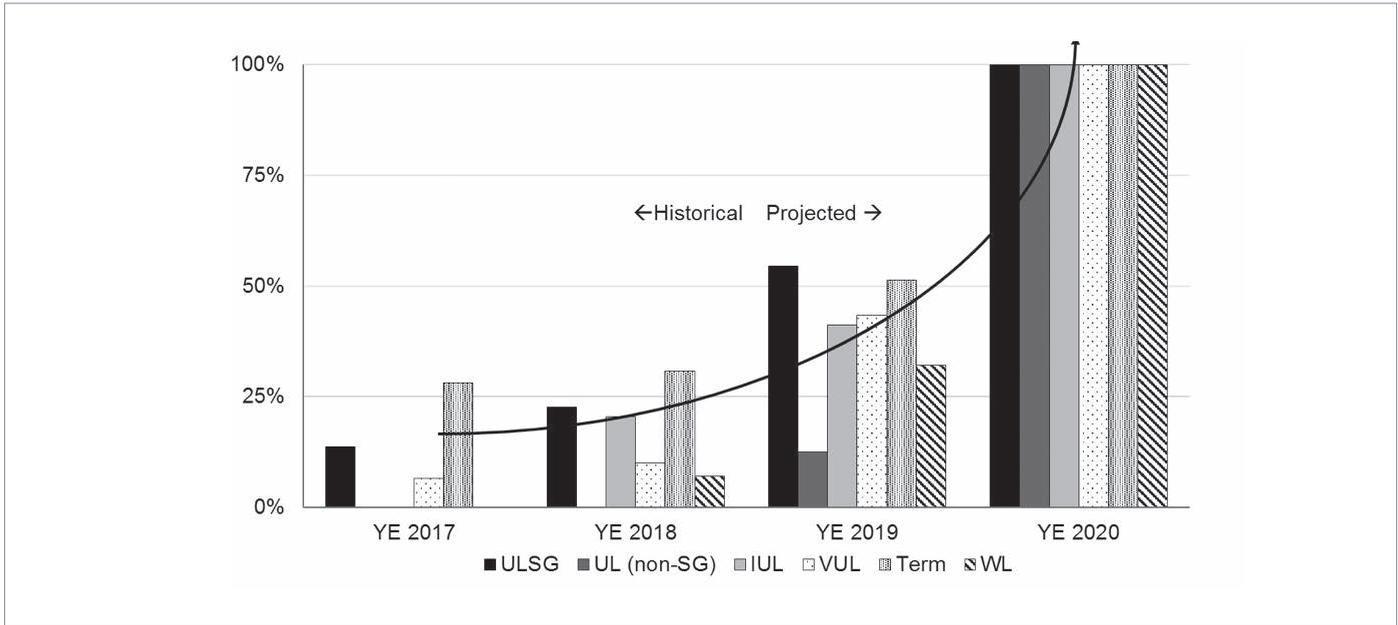
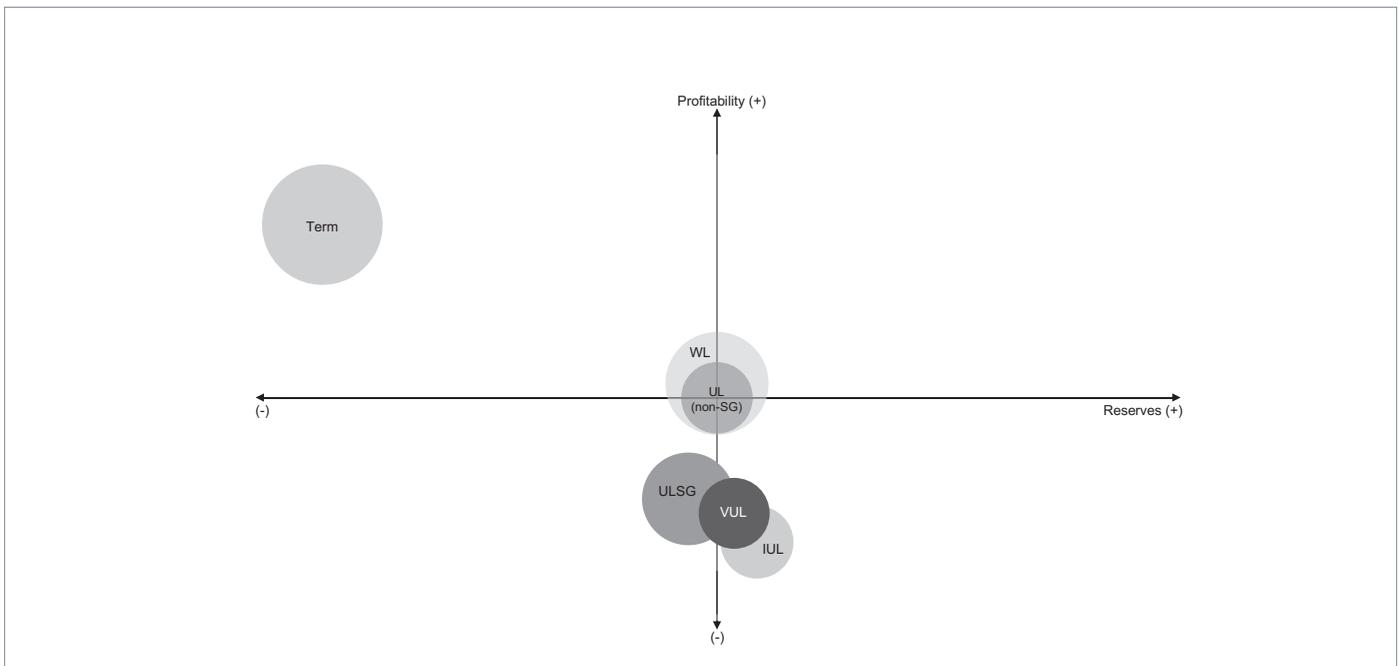


Figure 2
Percentage of Participants With Products on PBR by Year-End



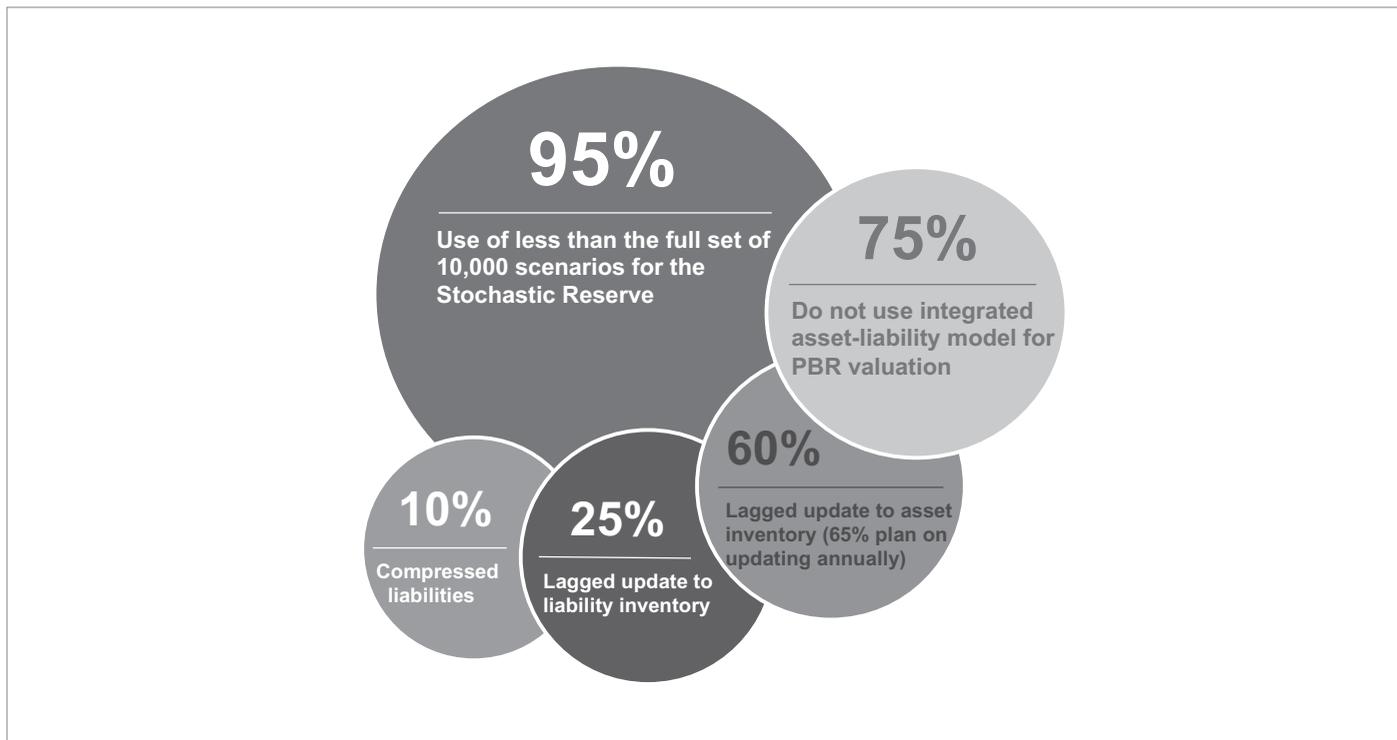
The percentages were calculated as (number of participants with at least one product in category on PBR) / (total participants with products in category). IUL: indexed universal life. UL: universal life. ULSG: universal life with secondary guarantees. VUL: variable universal life. WL: whole life. YE: year-end.

Figure 3
Reported PBR Impact on Reserves and Profitability



The size of the bubble represents the percentage of respondents who write these products.

Figure 4
PBR Model Robustness and Simplifications



Aside from an influx of term and universal life with secondary guarantees (ULSG) products moved to PBR in 2017, few products have moved to PBR during the optional three-year phase-in period. As of year-end 2018, approximately 30 percent of writers had moved a term product to PBR as compared with 25 percent for ULSG and 20 percent for IUL. Excluding term, 75 percent of writers have yet to move their products to PBR. Planned implementations for 2019 will primarily occur in the fourth quarter, followed by an influx of the remaining products at the start of 2020.

Figure 3 (pg. 19) shows the anticipated impact on reserves and profitability by life product type and sheds some additional light on drivers for delayed implementation.

Most term writers expect large decreases in reserves under PBR. The corresponding impact on profitability is mixed because of the use of reserve financing solutions and the reduced tax leverage that comes with a reduction in reserves. Writers not using financing solutions had an incentive to move to PBR early on, whereas those using solutions had an incentive to delay implementation.

Most ULSG writers expect small decreases in reserves under PBR. The use of financing leads to a similar (mixed) impact on

profitability as term as well as an incentive to delay implementation for those using a reserve financing solution.

Most writers are expecting minor impacts to reserves and profitability for the remaining product types (WL, UL, VUL and IUL), leading to the most delayed PBR implementation for these product types.

Competing regulatory and accounting changes (e.g., Financial Accounting Standards Board targeted improvements for long duration contracts, variable annuity reform, IFRS updates) are likely causing companies to prioritize and delay portions of their PBR implementation while making use of interim modeling simplifications.

PBR MODELING SIMPLIFICATIONS REMAIN WIDESPREAD

PBR modeling simplifications are widespread, especially with regard to assets. Figure 4 shows that modeling simplifications related to assets and scenarios are most prevalent, as this is the area where PBR required most new functionality.

The most common model simplification for liabilities was the exclusion of riders from modeled reserves (i.e., deterministic reserve and stochastic reserve), as shown in Table 1 (pg. 21).

Table 1
Treatment of Riders in Modeled Reserves

Rider	Exclude
Waiver of premium	80%
Other riders and supplementary benefits	59%
Acceleration of benefit (non-zero cost)	37%
Long-term care	34%
Acceleration of benefit (zero cost)	32%

THE ROAD AHEAD

The extent of model simplifications indicates that many carriers are taking a “smart compliance” approach, where they try to leverage existing infrastructure to meet the PBR implementation deadlines—in effect, deferring necessary model and process improvements until after the mandatory implementation date.

As the finish line approaches, it is important for companies to skillfully manage the regulatory and accounting changes in order to be prepared and accurate on “day 1” while also establishing a modeling and reporting foundation that is sustainable. ■



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Results From VA Assumptions Survey

By Zhuoyu Julia Hu, Michael Beck and David McLeroy

The valuation of excess benefit liabilities on variable annuities (VAs) is highly sensitive to the assumptions used. In this article, we share selected results from a survey conducted in May of best-estimate VA assumptions as of year-end 2018.

The survey consisted of 18 respondents that range from companies with small blocks of VA business to those with over \$100 billion in separate account assets. All companies in the survey must report on a U.S. statutory basis, while most are also required to report on a U.S. GAAP basis, and only a few will report under IFRS 17. Five of the companies are closed to new VA business, and the 13 others are still selling variable annuities. The riders offered historically have been guaranteed minimum accumulation benefit (GMAB), guaranteed minimum death

benefit (GMDB), guaranteed minimum income benefit (GMIB), guaranteed living withdrawal benefit (GLWB) and guaranteed minimum withdrawal benefit (GMWB), though not all of these are still available to policyholders. The number of riders companies are offering has fallen with GMDB being the most common for new policies.

In the following sections we report on the lapse, utilization and separate account return assumptions.

LAPSES

The lapse assumption is used to project how many policies are expected to remain in force at future periods, where a higher lapse assumption means that fewer policies are anticipated to remain active. This is a complex assumption for variable annuity products, and companies typically consider a wide range of factors to determine their policy-level assumption. Complexity is added because depending on the circumstances, either higher or lower lapse rates can result in higher reserves (e.g., lower lapses for deep in-the-money policies and higher lapses for out-of-the-money policies).

Factors Used in Lapse Assumption

Figure 1 summarizes the total number of factors considered when setting the base and dynamic lapse assumption for each GMxB benefit type.

Figure 1
Number of Factors Considered When Setting Lapse Assumption

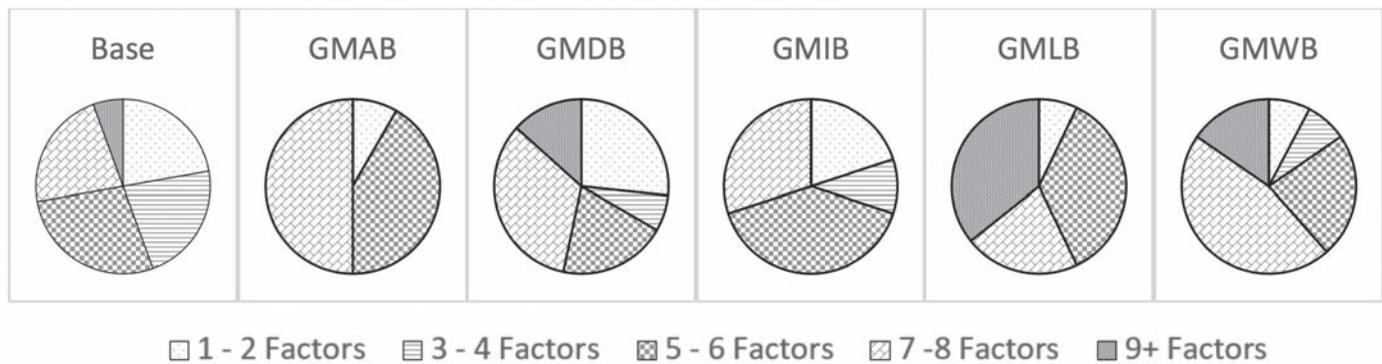


Table 1
Base and Dynamic Lapse Rates

	Duration	0	1	2	3	4	5	6	7	8	9	10	Ultimate
Base Lapse	Min	0.4%	0.5%	0.7%	1.0%	1.3%	1.4%	1.5%	10.3%	3.2%	2.6%	1.6%	1.5%
	Max	4.5%	4.5%	4.5%	6.5%	6.8%	9.1%	9.3%	30.0%	14.8%	12.0%	11.8%	11.8%
Dynamic Lapse 10% ITM	Min	0.2%	0.2%	0.3%	0.3%	0.4%	0.4%	0.6%	1.5%	1.0%	1.0%	1.0%	1.0%
	Max	3.6%	3.6%	3.6%	5.1%	6.2%	8.3%	8.5%	22.0%	14.3%	11.8%	11.8%	11.8%
Dynamic Lapse 50% ITM	Min	0.1%	0.2%	0.3%	0.3%	0.4%	0.4%	0.6%	1.5%	1.0%	1.0%	1.0%	1.0%
	Max	3.0%	3.0%	3.0%	4.3%	4.3%	5.9%	5.9%	16.6%	14.3%	11.8%	11.8%	11.8%

Among the 18 respondents, fewer than 25 percent use only one or two factors in developing base lapse assumptions; these companies tend to have a smaller VA GAAP liability. The most prevalent factor used in setting the base lapse assumption is policy duration, which is used by 83 percent of companies. The mean number of factors used by companies in the survey was 4.9.

When setting the dynamic lapse assumption, the rider in-the-moneyness (ITM) and policy duration are the two factors that were most frequently used for each GMxB rider. The mean number of factors used for the dynamic lapse assumption is greater than the mean number of factors used for base lapse assumption, with GLWB dynamic lapse assumption reflecting the highest number of factors used at 7.8, and GMWB dynamic lapse assumption reflecting the second most factors at 7.0. This relationship is expected given the need to reflect complex policyholder behavior for the riders under different economic circumstances.

The Moneyness of the Rider

As discussed above, ITM is a key factor influencing dynamic lapses. The definition of moneyness used most by respondents in their models is the ratio of benefit base (allowing for withdrawals) to account value. Other definitions include the ratio of actuarial present value of benefits to account value or $1 - (\text{account value/benefit})$. In determining dynamic lapses, an exponential formula based on ITM is most widely used (33 percent). Other types of dynamic lapse formulas include constant factor

based on each ITM range (22 percent), linear function within each ITM range (22 percent), exponential formula (11 percent), nonparametric formula (6 percent) and predictive modeling using logistic functions (6 percent).

Lapse Rate

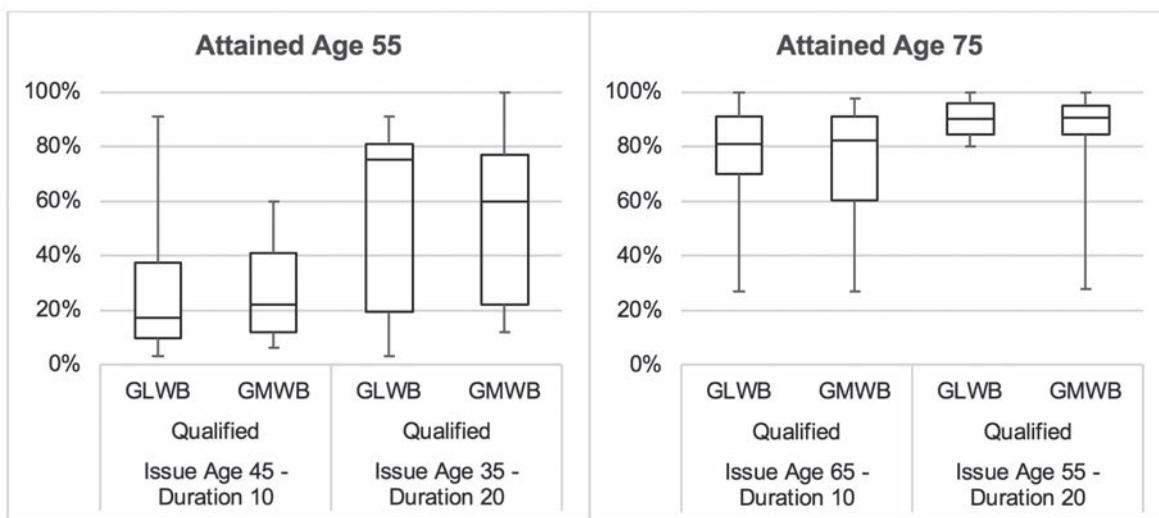
Respondents provided base and GMWB dynamic lapse rates for a seven-year surrender charge period variable annuity product, which are summarized in Table 1 (pg. 22).

The table shows how ITM affects the dynamic lapse assumption. For the respondents who participated in the VA assumption survey in 2018 and 2019, the average base lapse and GMWB dynamic lapse assumptions in the surrender charge period are generally consistent between the two years. However, in the post-surrender charge period, the average base lapse assumption decreased significantly between 2018 and 2019, with a smaller decrease for the 10 percent ITM and 50 percent ITM values.

Lapse Study Period

Our survey also asked about the assumption-setting process, and respondents provided the source data used in the experience study and the period used. Companies were evenly divided between using internal data and using a hybrid of internal data and industry studies. All respondents use at least three years of experience, while 65 percent of the respondents used more than six years of experience for developing lapse assumptions.

Figure 2
Range of Assumed Withdrawal Rates



WITHDRAWAL BENEFIT UTILIZATION

Another important assumption for VAs is the utilization assumption. The utilization assumption is divided into two elements, the frequency and the severity.

Utilization Frequency

The utilization frequency assumption is related to the propensity of policyholders to exercise their guaranteed withdrawal benefits (either for-life or not-for-life). This assumption is directly related to the excess benefits, and an increase in this assumption will increase reserves that are held. Figure 2 (pg. 23) shows the range (in quartiles) of withdrawal assumptions for attained age 55 and 75 at duration 10 and 20. We also asked about attained age 65 and the difference between qualified and unqualified policies.

Here are a few observations from the results of our survey on utilization frequency:

- As attained age increases, the percentage of policyholders assumed to be utilizing the benefit increases. As duration increases, the utilization also increases.
- The range of the utilization decreases only slightly as age increases, while the interquartile range decreases significantly, highlighting a trend toward convergence across the industry.

- The difference between GMWB and GLWB rates was not significant; in general, the qualified policies have similar rates to nonqualified policies.

Utilization Severity

Along with the frequency, companies must assign an assumption as to how much of the benefit a policyholder will elect. A “rational policyholder” might elect to take 100 percent of the annual amount; however, policyholders rarely react fully “rationally” based on an optimization of benefits. For example, policyholders may require additional liquidity at the time of benefit election and choose to withdraw over 100 percent of their annual withdrawal amount (eating into the base benefit). Alternatively, they may feel that the market growth they can achieve by leaving money invested justifies withdrawing less than their full guaranteed benefit. As one might expect given the complexity of predicting human behavior, our survey suggested that there is a wide range of practice in estimating policyholder utilization. Some observations include:

- Companies are split almost equally between three approaches: (1) assume 100 percent utilization, (2) assume less than 100 percent utilization, (3) a nonsingular assumption.
- Where an efficiency of less than 100 percent is used, the mean assumption was that policyholders were withdrawing 95 percent of the annual withdrawal amount.





- For those using a nonsingular assumption, they are using a more granular assumption at either the policy or the group level.

Utilization Study Period

We asked respondents about the experience study period that they use when setting the utilization assumptions. The experience study period varied significantly, with a minimum of two years and a maximum of 15 years used. As with lapses, companies were evenly divided between using internal data and using a hybrid of internal data and industry studies.

Separate Account Return

The separate account return assumption reflects management's view of the long-term growth in the separate account. Respondents were asked to provide their assumption used in the estimated gross profit projection (before taking out the mortality and expense charges), the composition of the portfolio backing the assumption, and the method of grading to their long-term assumption.

The separate account return assumptions used by the respondents ranged from 5.7 percent to 8.5 percent, with a mean value of 7.21 percent. Two-thirds of the respondents have a return assumption between 6.5 percent and 8 percent. For the 12 re-

spondents that participated in the VA assumption survey in both 2018 and 2019, the average separate account return assumption decreased slightly from 7.26 percent to 7.22 percent.

The portfolio composition used to determine the separate account return assumption generally consists of a blend of equities, bonds and cash. The average portfolio is made up of 65 percent equity, 29 percent bonds and 6 percent cash.

Half of the respondents indicated that mean reversion is used for grading to the long-term separate account return assumption. One-third of respondents stated that the long-term separate account return assumption is reflected immediately without grading. The remaining respondents either used a fixed period for grading or graded differently for equity and fixed income securities. The most common grading period is five years.

CONCLUSION

As can be seen from the results discussed in this article, there is a considerable range of practice across assumptions used by the industry for variable annuities. There is a propensity to use complex assumptions to better match the underlying complexity in the products with the behavior expected from policyholders in a dynamic and volatile economic environment. Our thanks go to the participants of this survey for giving their time and input to this survey. ■



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ICS—Changes on the Horizon—Part 2: Liability Valuation

By J. Peter Duran and Grant K. Knapman

This is the second in a series of articles on the insurance capital standard (ICS). In our first article, we gave an overview of the status of the ICS and highlighted some of the more contentious issues. This is the last year of field testing (FT) prior to the adoption of the “Reference ICS,” also referred to as “ICS 2.0,” in November 2019. This article focuses on what has been the most contentious area, namely the determination of the valuation discount rate.

THE THREE-BUCKET APPROACH

The 2019 FT continues the “three-bucket approach” of the 2018 FT. As described in our prior article, this approach seeks to recognize an “illiquidity premium” over the risk-free rate for portfolios with assets and liabilities that are considered sufficiently well matched. To qualify for the additional spread, the asset-liability portfolio must meet criteria intended to ensure that asset-liability risk is mitigated.

Liability portfolios are separated into three “buckets” of decreasing degrees of asset-liability cash-flow matching and consequent recognition of spread. The top bucket uses a spread based on the insurer’s own assets, the middle bucket uses the International Association of Insurance Supervisors’ (IAIS’s) prescribed spreads applied to the insurer’s own fixed income asset mix, and the general bucket uses prescribed spreads based on a reference portfolio of fixed income assets. The top bucket uses an “application ratio” (percentage of spread recognized in the discount rate) of 100 percent, the middle bucket 90 percent, and the general bucket 80 percent. The application ratio is applied to the net spread after a “risk correction” for expected defaults.

The criteria for the top two buckets applied in the 2018 FT were very restrictive. Very few portfolios met the criteria for the top bucket, with the typical example being portfolios of payout annuities of UK insurers that already meet the strict criteria for the Solvency II matching adjustment. Additionally, few portfolios met the criteria for the middle bucket. Therefore, the great majority of portfolios fell into the default general bucket.

Unsurprisingly, this contributed to poor results at the industry level for companies with long-term business.

The 2019 FT seeks to address the “empty bucket issue” by loosening the criteria for the middle bucket and testing alternative, less restrictive criteria¹ as well. (The top bucket criteria remain unchanged). However, the changes have only slightly relaxed the criteria for the middle bucket, and we hold the view that it will not materially address the issue. At the time of writing this article,² the approach that will be adopted for ICS 2.0 is not clear.

The IAIS’s stated rationale for tying the permissible discount rate to the degree of cash-flow matching is that the greater the cash-flow matching, the more likely the insurer is to be able to “earn the spread.” If the degree of cash-flow matching is below the threshold for the middle bucket, a lower spread is justified since the ability to earn the spread is reduced. Further, lapse risk cannot be too large; the lapse risk charge may not exceed 5 percent of the liability value. The spread can be “earned,” so the narrative goes, if the assets can be held to maturity. The concern, however, is that the liabilities may be “liquid” (i.e., policyholders may be able to exercise surrender options, forcing the assets to be sold at a loss before maturity).

A CHALLENGE

But are liquid liabilities or a lower degree of cash-flow matching sound reasons for a discount rate that recognizes less spread? Our contention is that they are not. Less well-matched portfolios, especially ones that include liquid liabilities, are undeniably riskier than more well-matched ones. There is less likelihood of being able to earn *whatever* discount rate is assumed for such a portfolio. Earning the spread should not be the concern. Rather, the concern should be earning the discount rate itself, including the risk-free rate. In extreme cases, there is a distinct possibility of not being able to earn anything at all (i.e., a negative return).

Our contention is that a well-designed solvency framework should address this risk via appropriate risk charges, not by adjusting the valuation discount rate. The best estimate liability (BEL) should be a “true” picture of the liability without embedded conservatism. This will allow for required capital stresses to be appropriately designed and calibrated with a focus on the risks rather than distorted by prudence in the BEL itself. The alternative—to limit the spread inherent in the valuation approach—is a blunt risk management tool that in many cases produces significant basis risk and “noise” and, therefore, increases management complexity.

We aim to present a highly stylized example that illustrates the following:



- From a prudential point of view, the company’s ability to “earn the spread” should not be the primary concern. The concern should be larger: The total discount rate (i.e., risk-free plus spread), may not be earned.
- Liability liquidity is not the real issue. An inappropriate investment strategy may be very risky even in the presence of illiquid liabilities.
- The own assets (OA) approach gives a far more accurate depiction of actual economic risk. It neither understates nor overstates economic resources required to meet the company’s obligations.
- The system is most transparent when there is a clear distinction between the best estimate valuation used for the economic balance sheet and the capital required to cover risk. The risk-free valuation blurs this distinction.

AN EXAMPLE

Consider a portfolio consisting of a single premium two-year non-surrenderable bullet liability backed by a 10-year zero-coupon bond rated BBB. The single premium is currency unit (CU) 1,000. The liability credits 4 percent. There are no expenses, policy charges or taxes. The bond is bought at par, and at maturity it pays the par value plus interest compounded at 6.5 percent. The example is extreme to illustrate a point.

The liability is completely illiquid; it cannot be surrendered. Despite this, the cash flow mismatch means that when the liability comes due at the end of two years, the bond will have to be sold. There is no ability to hold until maturity. If interest rates do not change, the bond will return 6.5 percent and the insurer will earn a profit of 2.5 percent, the “expected” result. But suppose there are two other possibilities, namely that BBB interest rates rise or fall by 2 percent, resulting in either a much greater or lower profit than expected. Table 1 summarizes the range of possible results.

Table 1
Ultimate Profit or Loss After All Assets and Liabilities Are Settled

Scenario	Expected	Up	Down
Profit (Loss) at Year 2	52.62	(104.23)	238.38
Rate Earned on Assets	6.50%	(1.14%)	14.89%

In the up scenario, the company has lost its bet on interest rates. Things have gone terribly wrong. Note that it is completely irrelevant whether the BBB rate increased due to spread widening or risk-free rates increasing. Whatever the spread may have been, clearly it was not earned, but more importantly, neither was the risk-free rate. In fact, total investment earnings were negative, at -1.14 percent.

When designing a solvency regime, the question is how to reflect risk in this type of situation. As noted, a component of the “solution” offered by the current version of the ICS is to reduce the spread recognized in the discount rate while at the same time imposing charges for interest rate risk and spread widening risk. If reducing the spread recognized is a good thing, then presumably no spread would give the best result. However, this can be proven not to be the case. In fact, the risk-free approach requires excessive capital when the scenarios are favorable (i.e., expected or down) and the “right” amount only when the scenario is adverse. In other words, it overstates risk and sends a false signal to stakeholders. On the other hand, a valuation using the risk-free rate plus the BBB spread gives the “right” amount in all cases.

To illustrate, we need to make an assumption about the risk-free rate and the BBB spread. We assume the one- and two-year risk-free spot rates at time zero are 3 percent, while the 10-year spot is 5 percent and the BBB spread (net of a risk correction for expected defaults) is 1.5 percent. Under the current ICS construct, capital needs to be held for interest rate risk (i.e., adverse changes in risk-free rates) and for non-default spread risk (i.e., adverse changes in spreads).³

Let’s consider what happens under three economic scenarios assuming risk-free valuation—namely:

- **ES1:** Risk-free interest rates and spreads remain unchanged during the two-year period.
- **ES2a:** Risk-free rates increase 2 percent immediately after the policy is issued and then remain unchanged.

- **ES2b:** The BBB spread widens by 2 percent immediately after the policy is issued and then remains unchanged.

Table 2A summarizes the possible results.

Now consider the case where liability valuation is based on discounting at rates earned on OA, as shown in Table 2B.

The initial shareholder investment in Table 2B is 84 percent of that in Table 2A. In the favorable scenario (ES1), total shareholder investment and return are less than under the risk-free approach. In the unfavorable scenario, on the other hand, total shareholder investment is about the same but emerges more slowly, namely as risk is realized. Shareholder return, which is negative, is approximately the same under both approaches. Under the OA approach, the shareholder investment does not depend on changes in the spread over risk-free rates but rather on changes in the rate earned on the assets, regardless of whether that stems from changes in risk-free rates or spreads or a combination of the two. This makes intuitive sense, as it is the entire discount rate on which the liability valuation depends rather than its components.

It is important to note that the math actually shows that the problem arises whenever a discount rate is used that is less than the rate earned on the assets (i.e., whenever the application ratio is less than 100 percent). However, it is most extreme when no spread is assumed.

Table 2A
Shareholder Investments⁴ and Returns Under Risk-Free Valuation

Scenario	Shareholder Investment			Shareholder Return	
	Time 0	Time 1	Total	In CUs	As a Percent
ES1	233.59	0.00	233.59	301.70	13.6%
ES2a	233.59	114.33	347.92	248.12	-18.5%
ES2b	233.59	118.93	352.53	253.12	-18.3%

Table 2B
Shareholder Investments and Returns Under the OA Approach

Scenario	Shareholder Investment			Shareholder Return	
	Time 0	Time 1	Total	In CUs	As a percent
ES1	195.58	0.00	195.58	274.46	18.5%
ES2a	195.58	157.00	352.58	257.27	-18.6%
ES2b	195.58	157.00	352.58	257.27	-18.6%

OTHER DISCOUNT RATE ISSUES— UNDERLYING RISK-FREE RATES

Risk-free curves are specified by currency and may be based on government bonds or swaps. For each currency, a “last observable term” (LOT) is specified, which is the last term at which the reference market (for swaps or government bonds) is deep and liquid. From the LOT onward, forward rates grade to a long-term forward rate (LTFR), generally at duration 60, using Smith-Wilson interpolation.

The approach to the risk-free rate, including the LTFR, is generally seen as reasonable.

OTHER DISCOUNT RATE ISSUES— ULTIMATE SPREAD

Under both the middle and general buckets, the spread grades to 15 basis points over the same period as the risk-free rate grades to the LTFR. This is controversial. Many believe that a long-term spread concept should be introduced. They point out that grading to 15 basis points in effect assumes the bond market ceases to exist after the LOT or perhaps that there is no guarantee of “liability liquidity” after the LOT. In our view, both assumptions are problematic at best. Table 3 shows historical spreads on USD bonds with a maturity greater than 10 years from 1919 to 2014.

Table 3
Historical Credit Spreads (in Basis Points)⁵

	AAA	AA	A	BBB
Mean	82	106	140	203
Standard Deviation	46	56	73	99
Minimum	14	23	32	51
25th Percentile	44	56	79	126
Maximum	424	347	478	802

OTHER DISCOUNT RATE ISSUES— RECOGNITION OF SPREAD ON EQUITIES

The ICS recognizes no spread on equities. Some believe that recognition of a spread on equities is appropriate when equities back long-term liabilities. Equities can play an important role in

backing liability exposures beyond the investable horizon and are a stable component of insurer asset portfolios over the long term; it is our view that the ICS should recognize the role these assets can play in insurers’ asset-liability management. The current approach creates disincentives for investment in equities. This issue will be discussed in more detail in a subsequent article in this series.

CONCLUSION

We have endeavored to demonstrate that an OA approach, where liability valuation is linked to the underlying assets, is more useful within a solvency regime than an approach where liability valuation is disconnected from the supporting assets because it leads to better risk management and more realistic, yet sound, quantification of liabilities. ■



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ENDNOTES

- 1 The technical specifications for the 2018 and 2019 FT can be found on the IAS website.
- 2 September 2019.
- 3 Other than the risk correction for expected default, credit risk is ignored as it is not relevant to this discussion since it is the same under all scenarios considered.
- 4 Defined as the difference between the policy liability plus required capital (RC) and existing assets. At time zero this is RC less the premium. At time 1, it is RC less the market value of the bond purchased with the premium. RC is calculated so as to be sufficient such that assets will meet liabilities under a 2 percent shock to interest rates and credit spreads. Spreadsheets supporting all calculations are available from the authors.
- 5 Hennink, Erik. (2018). Long-Term Expected Credit Spreads and Excess Returns: Portfolio Modelling, Performance Attribution and Governance. 10.1007/978-3-319-90245-6_8.

IFRS 17: Implications for Onerous Contracts

By Tze Ping Chng, Steve Cheung, Terrance Lee and Fung Chan

After a very long journey, the International Accounting Standards Board (IASB) issued IFRS 17. IFRS 17 replaces IFRS 4, which was issued in 2004. The overall objective of IFRS 17 is to provide a more useful and consistent accounting model for insurance contracts among entities issuing insurance contracts globally.

To increase the transparency of an entity's performance, the entity is required to group contracts in a way that reflects the profitability at initial recognition. IFRS 17 requires an entity to identify portfolios of insurance contracts (within the same financial reporting year) and to further divide the group of contracts that are onerous at initial recognition (if any) from the profitable group

of contracts. The IASB determined that the onerous contracts should not be hidden and that the respective losses should be accounted for explicitly in the statement of comprehensive income (SCI) when it was known. This treatment is consistent with the recognition of losses for onerous contracts in accordance with IFRS 15 *Revenue from Contracts with Customers* and IAS 37 *Provisions, Contingent Liabilities and Contingent Assets*.

An insurance contract is onerous at the date of initial recognition if the fulfilment cash flows (FCF) allocated to the contract, any previously recognized insurance acquisition cash flows, and any cash flows arising from the contract at the date of initial recognition in total are a net outflow [IFRS 17.47].¹

Reinsurance contracts held cannot be onerous [IFRS 17.68]. Instead of profitable or onerous contracts, IFRS 17 views them as the net cost or gain on purchasing the reinsurance contracts. Both positive and negative contractual service margin (CSM) are allowed for reinsurance contracts held (RCH), unless the reinsurance coverage relates to events that occurred before the purchase of the reinsurance (retroactive cover). In subsequent measurement, changes in the FCF that relate to future service are adjusted to RCH's CSM, unless they are stemming from changes that do not adjust the CSM of the related underlying contracts (UC).

Table 1

Summary of Profitable and Onerous Contracts Treatment for UCs and RCHs (updated for the June 2019 proposed amendments by IASB)—Under GMM

UC/ RCH and Profitability group	Linkage With RCHs or UCs	Initial CSM	Initial Recognition in SCI	Linkage Between UC and RCH in Subsequent Measurement
Profitable UC	Without RCH covered	Non-negative	No day 1 gain is recognized	N/A
Onerous UC		Zero	Recognize the loss immediately	
Profitable UC	With RCH covered	Non-negative	No day 1 gain is recognized	Offset between UC and RCH if the UC becomes onerous or more onerous (on the portion covered by RCH)
Onerous UC	With nonproportionate RCH covered	Zero	Recognize the loss immediately	
Onerous UC	With Proportionate RCH covered	Zero	Recognize the loss immediately, and with consideration of the RCH income offset	
RCH	Related UCs are profitable at initial recognition	Positive or negative	No day 1 cost or gain is recognized (except for the net cost under retroactive cover)	
Nonproportionate RCH	Related UCs are onerous at initial recognition			
Proportionate RCH	Related UCs are onerous at initial recognition			

Under the June 2019 proposed amendments to IFRS 17, for onerous UCs that are covered by RCHs that provide proportionate coverage, an entity shall adjust, at initial recognition, the CSM of the RCH and recognize RCH income to offset the corresponding portion of UC loss. Table 1 summarizes the latest IASB proposals on the treatment of the profitable and onerous contracts for UCs and RCHs under the general measurement model (GMM).

This article discusses the key IFRS 17 requirements of the accounting for onerous contracts, with an illustrative example to demonstrate the systematic allocation requirement for the UCs.

HOW DOES IFRS 17 APPLY TO ONEROUS CONTRACTS?

What is the level of aggregation requirements to determine the profitability grouping of insurance contracts issued as of initial recognition?

To the extent that paragraph 17 applies, an entity may identify the group of onerous contracts by measuring a set of contracts rather than individual contracts [IFRS 17.47].

An entity should apply the recognition and measurement model requirements of IFRS 17 to onerous contract testing. An entity may identify the group of onerous contracts by measuring a set of contracts rather than individual contracts if an entity has reasonable and supportable information to conclude that a set of contracts will all be in the same group (i.e., there will be no offsetting effects of onerous and profitable contracts in the same group). If an entity does not have reasonable and supportable information, then it shall determine the group of onerous contracts by considering individual contracts. While there is no clear guidance on the “reasonable and supportable information,” it is generally expected that the entity can leverage relevant information produced during the product development stage.

Can an entity reassess the onerous contract grouping in subsequent measurement?

An entity shall establish the groups at initial recognition and add contracts to the group applying paragraph 28. The entity shall not reassess the composition of the groups subsequently [IFRS 17.24] except when there is modification.

Are there any particular differences for onerous contract treatment under the GMM and variable fee approach (VFA)?

No. The distinctions between GMM and VFA are the same for profitable and onerous contracts.

What is the treatment for a group of contracts under the premium allocation approach (PAA) that is onerous?

The same principle of grouping applies to insurance contracts under PAA, but the standard wording is adapted to reflect its specific characteristics. The entity assumes all contracts are not



onerous at initial recognition unless facts and circumstances indicate otherwise. The entity also assesses whether the profitable contracts at initial recognition have no significant possibility of becoming onerous subsequently by assessing the likelihood of changes in relevant facts and circumstances.

If facts and circumstances indicate that a group of contracts is onerous during the coverage period, an entity shall calculate the difference between (i) the carrying amount of the liability for remaining coverage (LRC), excluding the loss component determined under PAA, and (ii) the FCF that relate to remaining coverage similar to what is needed under the GMM. The entity shall recognize this difference as a loss and increase the liability for remaining coverage.

What is a systematic allocation between (i) the loss component of the liability for remaining coverage and (ii) the liability for remaining coverage, excluding the loss component, under GMM?

The entity should track the remaining loss component (LC). If a group of contracts is onerous, there is no CSM. The entity shall allocate the subsequent changes in FCF of the LRC on a systematic basis between (i) the LC and (ii) the LRC, excluding the LC, with the following considerations:

- estimates of the present value of future cash flows for claims and expenses released from the LRC because of incurred insurance service expenses;
- changes in the risk adjustment (RA) for nonfinancial risk recognized in profit or loss because of the release from risk; and
- insurance finance income or expenses.

What is the treatment for contracts that become more or less onerous in subsequent measurement?

See Table 2 (pg. 32) for a summary of treatment for contracts that become more or less onerous in subsequent measurement.

Table 2
Summary of Treatments for Contracts That Become More or Less Onerous in Subsequent Measurement

Subsequent Measurement/ Measurement Model	GMM	VFA	Implications to SCI
Contract becomes onerous or more onerous	Unfavorable changes relating to future service in the FCF arising from changes in estimates of future cash flows and RA exceed the carrying amount of the CSM	Decrease in the amount of the entity's share of the fair value of the underlying items or increase in FCF relating to future service that exceed the carrying amount of the CSM	An entity shall recognize an LC (or additional LC) depicting the losses in SCI to the extent of the excess listed. Subsequently, this LC is then presented in SCI as reversal of losses on onerous groups and is consequently excluded from the determination of insurance revenue.
Onerous contract with favorable changes related to future service	Any subsequent decreases relating to future service in the FCF arising from changes in estimates of future cash flows and RA	Any subsequent increases in the amount of the entity's share of the fair value of the underlying items or decrease in FCF relating to future service	An entity shall allocate the changes solely to the LC until the LC is reduced to zero and subsequently allocate the remaining portion of changes (if any) to CSM after the LC is depleted

Table 3
Projected Best Estimate Cash Flows (BECFs) and Initial Measurement

BECFs/Year	Yr1	Yr2	Yr3
Premium income	70	80	90
Claims and expense outgo	10	10	250
Investment component (included in the outgo)	3	3	75
Initial Measurement			
Initial loss	20		
Initial loss ratio	7.8%		

Table 4
SCI

SCI/Year	Yr1	Yr2	Yr3
Insurance revenue	6.5	6.5	161.3
Insurance service expense			
Claims and expenses incurred	(7.0)	(7.0)	(175.0)
Losses on new onerous contracts	(20.0)		
Allocation of subsequent changes in FCF to LC	0.5	0.5	13.7
Insurance finance income and expenses (IFIE)			
IFIE allocated to LRC, excluding LC	(1.1)	(2.4)	(5.3)
IFIE allocated to LC	(0.3)	(0.3)	(0.5)
Total profit	(21.5)	(2.7)	(5.8)

ILLUSTRATIVE EXAMPLE FOR SYSTEMATIC ALLOCATION UNDER THE GMM

The IASB considered whether to require specific methods to track the LC but concluded that any such methods would be inherently arbitrary. It therefore decided to require an entity to make a systematic allocation as noted above.

A simple three-year endowment product is created to illustrate one possible way of the allocation of subsequent changes in FCF of the LRC on a systematic basis between (i) the LC and (ii) the LRC, excluding the LC.

Table 3 summarizes the key fact pattern. We assumed no RA, time value of options and guarantees, and investment income. With the discounting applied, FCF equals 20, which means that the expected outflow is larger than the expected inflow; it is an onerous contract with an initial loss of 20. The initial loss ratio is calculated as the initial loss divided by the present value of total outgo (some also suggested the total outgo should exclude the investment component, which is not illustrated here).

Table 4 summarizes the items to be shown in SCI in this simplified example:

- Insurance revenue equals *Insurance component of the outgo * (1 - loss ratio)*
- For the insurance service expense, (i) the total outgo, excluding the investment component, is presented assuming everything goes as expected, (ii) the initial loss is recognized immediately in the SCI, and (iii) the allocation of subsequent changes in FCF to LC equals *Insurance component of the outgo * loss ratio*.
- For the insurance finance income and expenses, (i) IFIE allocated to LC equals *PV of total outgo_t * discount rate_t * loss ratio*, and (ii) IFIE allocated to LRC excluding LC equals *FCF unwinding minus Reversals of losses (IFE)*.
- Certain checking needs to be performed for the SCI: (i) The total insurance revenue is the amount of premiums paid to the entity, adjusted for a financing effect and excluding any investment components; (ii) the total reversal of loss plus the loss component part of investment component should equal the initial loss recognized in SCI; and (iii) total profit should tie with the net CFs (given no investment income is considered in this example).

CONCLUSION

While onerous contracts may not be a significant part of an entity's portfolio generally, the entity should consider its logic during

system development to ensure the SCI and corresponding disclosures can be handled properly by the IFRS 17 reporting systems.

The illustrative example included in this article provides only one of the approaches that fulfill the standard requirements under GMM, and we expect there are other ways of performing the systematic allocation. Similar to experience with Solvency II, it is generally expected that certain market consensus will converge on the approaches. The related methodology and considerations should be properly documented and approved within the entity's governance structure, and agreed with the entity's auditor. It is also important for individual entities to understand both the financial and operational impacts of the onerous contracts at the beginning of the implementation journey.

The views reflected in this article are the views of the authors and do not necessarily reflect the views of the global EY organization or its member firms. ■



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ENDNOTE

- 1 The references quoted by [] represent text or extracts from "IFRS 17 *Insurance Contracts* incorporating amendments as proposed in Exposure Draft Amendments to IFRS 17" (released as of June 26, 2019, by the International Accounting Standards Board) and Basis for Conclusions.

Financial Reporting Research Update

By David Armstrong and Ronora Stryker

Research is a primary mission of the Financial Reporting Section and a significant use of our section dues revenue. Here is an update, as of September 2019, on projects in process and those recently completed.

CURRENTLY IN PROCESS

“Mortality Improvement Trend Analysis.” This research examines the key drivers of mortality improvement and how they vary. Work has yet to begin on the project, as a researcher is being sought to perform the study.

“Predictive Modeling in Life Insurance Underwriting.” This study uses a case study approach to create a resource to help practitioners develop, evaluate, implement and monitor predictive models used in underwriting. This project is in the early stages.

“Simplified Methods for Principle-Based Reserve Calculations.” This project is in the late stages.

“Delphi Study of Economic Variables.” This study uses a Delphi Study framework to gather insights on the thought processes experts employ to estimate future values of economic variables. Work is in the mid-project stage.

“Macroeconomics-Based Economic Scenario Generation.” This project intends to find a practical way to improve economic scenario generators by studying the causes of economic development, economic volatility and capital market volatility. Work is in the late-project stage.

“Modeling and Forecasting Cause-of-Death Mortality.” This study will develop mortality projection models and produce cause-of-death mortality forecasts. Work is in the late-project stage.

RECENTLY COMPLETED

“The Application of Credibility Theory in the Canadian Life Insurance Industry.” This survey of credibility practices of Canadian life insurers compares and contrasts credibility methods used by the companies. The Financial Reporting Section contributed to the funding for this project.

<https://www.soa.org/resources/research-reports/2019/application-credibility-theory/>

“A Machine Learning Approach to Incorporating Industry Mortality Table Features in Mortality Analysis.” This research applies a machine learning approach that enables a practicing actuary to incorporate key industry mortality table features into insured mortality analysis.

<https://www.soa.org/resources/research-reports/2019/2019-machine-learning-approach/>

“The Use of Predictive Analytics in the Canadian Life Insurance Industry.” This project surveys Canadian life insurers on the use of predictive analytics in practice. The Financial Reporting Section contributed to the funding for this project.

<https://www.soa.org/resources/research-reports/2019/predictive-analytics-canadian-life-insurance/>

COMPLETED IN 2018

“Earnings Emergence Insurance Accounting Under Multiple Financial Reporting Bases.” This expands a 2015 research report on earnings emergence under multiple financial reporting bases. The original report looked at deferred annuities and term life insurance under U.S. SAP, U.S. GAAP, IFRS, CALM and market-consistent balance sheet approaches. This expanded report adds universal life and makes updates for principle-based U.S. statutory reserves, targeted changes to U.S. GAAP, and the new IFRS for insurance products. <https://www.soa.org/resources/research-reports/2018/earnings-emergence/>

“Survey of Waiver of Premium/Monthly Deduction Rider Assumptions and Experience.” This report summarizes the practices and assumptions that different companies use for waiver of premium and waiver of monthly deduction benefits. Survey topics included mortality, valuation and pricing, and they may be valuable to companies as they prepare for

a principle-based framework. <https://www.soa.org/research-reports/2018/survey-waiver-premium-monthly-deduction-rider/>

REQUEST FOR RESEARCH PROPOSALS

Do you have an idea for a research topic you would like to see the Financial Reporting Section consider for funding? If so, we want to hear from you! For more information, please contact Dave Armstrong or Ronora Stryker. ■



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MARK YOUR CALENDAR FOR KEY 2020 SOA EVENTS

ReFocus Conference

March 1–4 | Las Vegas, NV

Health Meeting

June 8–10 | Chicago, IL

Annual Meeting & Exhibit

Oct. 25–28 | Seattle, WA

Life & Annuity Symposium

May 4–5 | Saint Louis, MO

Valuation Actuary Symposium

Aug. 31–Sept. 1 | New Orleans, LA



For an updated listing of professional development opportunities,
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