

# The Financial Reporter

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SECTION

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CHAIRPERSON'S CORNER

# Time to Reflect

By Tara Hansen

As I sit here writing my last chairperson's corner, we are entering the dog days of summer. It is a time to sit back with our feet up knowing that the last of the 2014 financial statements have been filed and perhaps we can take some time to reflect and recharge for the 2015 reporting season which will very soon be upon us.

Although the upcoming developments in financial reporting are few in terms of new regulations and requirements, the emergence of new products and new environments has forced us to look harder at existing practices and processes which we may not have in the past. In some cases we have to look for problems where none previously existed (profits followed by losses emerging in the low interest rate environment). In others, we are looking to refine our practices with respect to existing valuation approaches as temporary short cuts are no longer good enough for blocks of business that are rapidly growing (GAAP valuation for IUL business). In still others, we have to look at valuation practices in a new light because of the low interest rate environment (PGAAP and the emergence of no or negative VOBA).

All of those items, as well as others I have neglected to mention, are keeping the financial reporting community on its toes as we plan for 2015 year end.

Looking forward, we are awaiting direction from the FASB on targeted improvements to US GAAP and we can see the IFRS insurance standard peaking at us on the horizon, although moving very slowly. In anticipation of the coming IFRS insurance standard, Tom Herget and

Jim Milholland are leading the charge on outlining and drafting the IFRS textbook, sponsored by our section. The author group has begun drafting its chapters after an all-hands meeting in June, so production of that book is underway, with the goal of having it ready when the standard is finalized as an aid to implementation. I would like to thank Tom and Jim for driving that effort forward.

Beyond that, as my time as a member of the financial report-

ing section council draws to a close, I want to thank my fellow council members and countless volunteers for everything you do for the section. It has been a tremendous experience for me and I am so honored to have served with all of you. ■



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# Dynamic Assumption-Setting for Variable and Non-Variable Annuities

Part 1: Full Surrender Rates for Variable Annuities with Guaranteed Lifetime Withdrawal Benefits

By Marianne Purushotham and Mark Birdsall

Assumption-setting is the foundation of a professional actuary's work. In traditional applications, actuaries know how to set assumptions when there is relevant, credible historical data available to use, but constantly changing environmental conditions and new product features bring advanced challenges.

What can actuaries do to incorporate the impact of dynamic factors such as the current interest and equity environment, current economic indicators, and current policy values in modeling processes? And how can actuaries set reasonable assumptions when there is a new benefit and experience is just emerging?

This article is the first of a three-part discussion that proposes an approach to develop dynamic assumptions using a combination of available experience data and simple predictive modeling techniques. In this article (Part 1), we will introduce the approach and apply it to develop full surrender assumptions for variable annuities (VAs) with guaranteed lifetime withdrawal benefits (GLWBs). In Part 2, we will use the approach to determine GLWB utilization assumptions for VAs. In Part 3, we will apply

the approach to non-variable annuities (NVAs) with guaranteed lifetime income benefits (GLIBs) and contingent deferred annuities (CDAs), and will propose a methodology for applications with limited historical data.

## PROPOSED METHODOLOGY

We propose a three-step methodology using simple predictive models to provide a means for actuaries to incorporate dynamic assumption structures to improve internal models.

Step 1: Develop a set of base experience assumptions by exploring the impact of various factors on currently available data.

Step 2: Incorporate the key factors identified in Step 1 to construct a predictive model to allow us to quantify the impact of dynamic factors on base experience assumptions.

Step 3: Use the predictive model constructed in Step 2 to develop a dynamic adjustment to base experience assumptions.

## STEP 1: Develop a Set of Base Experience Assumptions

The first step in a predictive modeling process is to explore the available experience data. In this article, we are looking to develop a base set of full surrender rates as well as understand what factors are the most likely candidates for inclusion in the development of a predictive model.

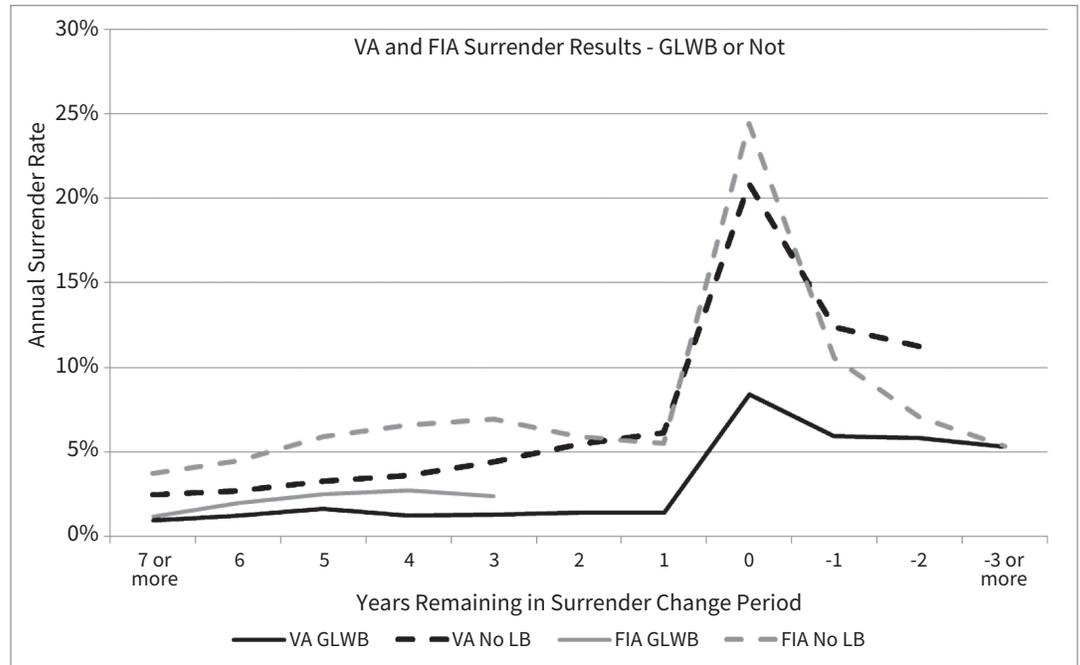
The data exploration in Step 1, will provide insight into setting the base full surrender assumptions and will also help identify key factors impacting full surrender rates that can be used in developing a dynamic surrender function using predictive modeling techniques.

## Full Surrender Experience for Contracts with and without Guaranteed Lifetime Withdrawal Benefit

Let's start with industry data on the impact of the presence of a GLWB or GLIB benefit on the full surrender rates of VAs and Fixed Indexed Annuities (FIAs). Exhibit 1 below shows rates of full surrender for 2013 on VA and FIA contracts as compiled by Ruark Consulting (used with permission).

This data is presented with the horizontal axis representing years remaining in the surrender charge period rather than

**Exhibit 1—Rates of Full Surrender – VA and FIA contracts**  
Presence of GLWB/GLIB Benefit



duration from issue, permitting the alignment of experience from products with different surrender charge periods.

As expected, for VA and FIA contracts without GLWBs or GLIBs, there is a large spike in full surrender rates at the end of the surrender charge period, between 20 percent and 25 percent, followed by large decreases in full surrender rates to about 6 percent for FIAs.

And based on this data, it appears that VA contracts with and without GLWB have a different level and pattern of full surrenders and therefore should be studied separately. For Part 1 of the discussion, this article will focus on the development of assumptions for VA contracts with GLWBs as dynamic factors are anticipated to have a significant impact in the presence of the GLWB.

Care must be taken in interpreting these data for VAs and

FIAs with GLWBs or GLIBs. Focusing on the solid lines in the above graph, data for both VA and FIA contracts with GLWBs include full surrender experience for contracts both before and after the utilization of the withdrawal benefit. However, Ruark notes that for FIAs to date, very few contractholders have begun to utilize the withdrawal benefit. Therefore, the FIA with GLWB line essentially represents pre-GLWB utilization rates of full surrender, while the VA with GLWB line includes a significant amount of surrender experience for VAs with GLWBs both before and after the exercise of the withdrawal benefit.

### FULL SURRENDER EXPERIENCE BY BENEFIT UTILIZATION STATUS

Next we look at variations in the VA with GLWB full surrender experience from the most recent LIMRA/SOA study by benefit utilization status. For

this purpose, we define the following contract benefit utilization categories in Table 1.

Exhibit 2 shows rates of full surrender by current benefit utilization status.

Note that here the horizontal axis represents duration from issue as most companies currently define base surrender

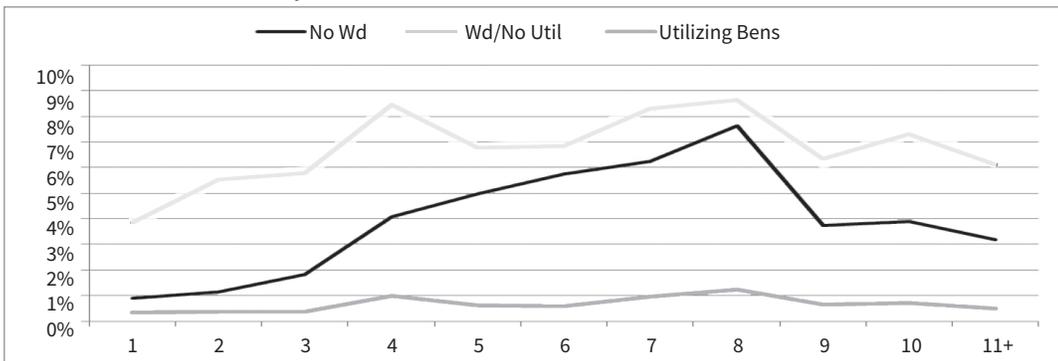
rate assumptions in terms of duration from issue, and we have taken that approach for this example. There are clear differences in the level and pattern of surrender experience by current benefit utilization status. Based on this data, base surrender experience rates will be developed separately for each benefit utilization status.

**Table 1**

Benefit utilization Status	Description	2013 Study Exposure	Comments
Status A	The contract holder has taken no withdrawals to date.	72%	
Status B	The contract holder has taken withdrawals, but the GLWB has not yet been utilized.	11%	This status includes withdrawals taken outside of 90% to 110% of the contractual maximum GLWB with no apparent pattern associated with GLWB utilization.
Status C	The contract holder is utilizing the GLWB benefit.	17%	Both Ruark and LIMRA consider that a contract is utilizing its GLWB benefit if the contract holder is taking regular withdrawals in the range of 90% to 110% of the contractual maximum GLWB.

### Exhibit 2—VA Contracts with GLWB

Rates of Full Surrender by Benefit Utilization Status



CONTINUED ON PAGE 6

### FULL SURRENDER EXPERIENCE BY ATTAINED AGE

Exhibits 3-9 (pgs. 6-9) examine the impact of other potential predictive factors on full surrender rates for pre-GLWB utilization contracts (Benefit Utilization Status A). This is the largest category of current industry in-force business representing just more than 70 percent of the total.

Exhibit 3 looks at full surrender rates by attained age group and policy duration from issue.

So surrender rates vary by attained age group but more significantly at durations 4 and later for contract holders between 70 and 80. The drop in full surrender rates after duration 8 may represent those contracts that have a longer roll-up period or second roll-up period for which the contract holder anticipates larger benefits.

### FULL SURRENDER EXPERIENCE BY SURRENDER CHARGE LEVEL

Exhibit 4 shows rates of full surrender by policy duration and surrender charge level.

As exemplified in the Total row of Exhibit 4, the impact of surrender charge level on surrenders is very significant and follows a similar pattern to Exhibit 3. The SC=0 column also follows this pattern of increases, followed by decreased surrender rates.

### FULL SURRENDER EXPERIENCE BY DISTRIBUTION CHANNEL

Exhibit 5 (pg. 7, top) shows rates of full surrender by policy duration and distribution channel. While banks appear to have higher overall rates of full surrender at several durations, other factors including product design must be considered

in comparing results by distribution channel. Perhaps most noteworthy is the similarity of the pattern of surrenders across all of these distribution channels: full surrender rates gradually increasing to a jump in duration 4, then increasing to a peak in duration 8, followed by decreased surrender rates.

### FULL SURRENDER EXPERIENCE BY IN-THE-MONEYNESS

Exhibit 6 (pg. 7, bottom) shows rates of full surrender by policy duration and in-the-moneyness (ITM). For this purpose, ITM is defined as the benefit base divided by the contract account value. Note the significant impact of ITM across the spectrum of values.

**Exhibit 3—Benefit Utilization Status A**  
Full Surrender Rates by Attained Age and Duration

Duration from Issue	Attained Age						Grand Total
	Under 60	60-64	65-69	70-74	75-79	80+	
1	0.9%	0.8%	0.8%	1.0%	1.1%	1.5%	0.9%
2	1.2%	1.1%	1.1%	1.1%	1.3%	1.3%	1.1%
3	1.8%	1.8%	1.7%	1.8%	2.1%	1.7%	1.8%
4	3.8%	4.0%	4.1%	4.8%	4.9%	4.0%	4.1%
5	4.6%	4.9%	5.0%	5.7%	5.9%	5.0%	5.0%
6	5.3%	5.6%	5.9%	6.7%	5.9%	6.0%	5.7%
7	5.9%	5.8%	5.8%	8.5%	6.8%	7.8%	6.3%
8	7.2%	6.6%	8.0%	9.7%	7.7%	8.6%	7.6%
9	3.4%	4.1%	3.2%	4.2%	2.6%	*	3.7%
10	4.8%	4.3%	3.0%	4.6%	1.1%	*	3.9%
11+	3.7%	3.7%	2.1%	4.6%	*	*	3.1%

\*Insufficient data

**Exhibit 4—Benefit Utilization Status A**  
Full Surrender Rates by Level of Surrender Charges and Duration

Duration	Overall	.09	.08/.085	.07/.065	.06	.05	.04	.03	.02	.01	0
1	0.9%	0.8%	1.0%	0.8%	0.1%	1.2%					2.2%
2	1.1%	1.1%	1.3%	0.9%	1.0%	1.6%	2.2%				2.5%
3	1.8%	0.9%	1.5%	2.2%	1.2%	2.0%	3.7%	2.3%			3.0%
4	4.1%	1.1%	2.2%	2.2%	5.4%	3.5%	2.8%	5.1%	3.6%		6.6%
5	5.0%		1.7%	2.6%	6.0%	2.9%	2.7%	3.4%	22.5%		8.1%
6	5.7%		1.4%		2.7%	3.3%	5.2%	3.7%	11.3%	10.1%	8.1%
7	6.3%						2.4%	3.2%	6.7%	9.9%	6.8%
8	7.6%						*	2.5%	4.8%	5.6%	8.1%
9	3.7%								2.3%	10.0%	3.9%
10	3.9%										3.9%
11+	3.1%										3.1%
<b>Total</b>	<b>2.5%</b>	<b>1.0%</b>	<b>1.3%</b>	<b>1.3%</b>	<b>2.4%</b>	<b>3.2%</b>	<b>3.2%</b>	<b>4.2%</b>	<b>7.0%</b>	<b>9.8%</b>	<b>6.2%</b>

\*Insufficient data

**Exhibit 5—Benefit Utilization Status A**

## Full Surrender Rates by Distribution Channel

Duration	Overall	Banks	Career Agents	Independent Agents/Brokers	Stockbroker/Wirehouse
1	0.9%	0.8%	0.7%	0.9%	0.6%
2	1.1%	1.1%	0.9%	1.1%	0.9%
3	1.8%	1.4%	1.9%	1.6%	1.1%
4	4.1%	4.7%	3.8%	4.0%	4.2%
5	5.0%	5.7%	4.1%	4.9%	4.6%
6	5.7%	7.1%	4.0%	5.6%	4.9%
7	6.3%	8.9%	5.6%	5.9%	7.3%
8	7.6%	9.8%	7.0%	7.0%	8.0%
9	3.7%	4.3%	3.9%	3.6%	4.3%
10	3.9%	2.8%	2.9%	4.1%	2.8%
11+	3.1%	2.7%	2.8%	3.0%	2.4%

**Exhibit 6—Benefit Utilization Status A**

## Full Surrender Rates by In-the-Money (ITM)

Duration	Overall	ITM<100%	100% < ITM < 125%	125% < ITM < 150%	ITM >=150%
1	0.9%	0.8%	0.9%	3.4%	*
2	1.1%	1.6%	1.1%	1.9%	*
3	1.8%	3.0%	1.7%	1.5%	*
4	4.1%	5.2%	4.2%	3.6%	3.6%
5	5.0%	8.1%	7.3%	3.5%	3.1%
6	5.7%	6.8%	7.4%	4.5%	3.8%
7	6.3%	12.5%	7.2%	4.6%	4.2%
8	7.6%	14.0%	7.3%	3.6%	2.3%
9	3.7%	2.4%	3.5%	4.1%	2.8%
10	3.9%	1.5%	4.3%	4.0%	4.3%
11+	3.1%	3.1%	3.6%	2.4%	*

\*Insufficient data

CONTINUED ON PAGE 8

For ITM > 125 percent, the full surrender rates become very flat, with no noticeable shock lapse. In this context, ITM incorporates the impact of economic scenarios on the contract account values, as well as product design including richness of benefit.

**FULL SURRENDER EXPERIENCE BY LEVEL OF INVESTMENT RESTRICTION ON THE GUARANTEED FUNDS**

The difference between these two categories of contracts is striking (see Exhibit 7). To the extent the investment restrictions are due to the GLWB, this provision may increase the prominence of the withdrawal benefit guarantee to the contractholder. The pattern of full surrenders for contracts with investment restrictions shown above had a similar impact to higher ITM—a significantly smaller spike in the surrender rate followed by decreasing surrender rates for the durations analyzed.

**FULL SURRENDER EXPERIENCE BY SIZE OF CONTRACT**

Exhibit 8 indicates that the larger the contract account, the lower the full surrenders for contracts in Status A. As with Exhibits 6 & 7, this pattern may reflect the greater prominence of the guaranteed withdrawal benefit as the prospective benefit size and its associated rider fees increases.

**Exhibit 7—Benefit Utilization Status A**  
Full Surrender Rates by Duration and Investment Restrictions versus No Restrictions

Duration	Overall	No Investment Restrictions	Investment Restrictions
1	0.9%	1.1%	0.8%
2	1.1%	1.5%	1.0%
3	1.8%	1.8%	1.8%
4	4.1%	5.6%	3.5%
5	5.0%	8.1%	3.9%
6	5.7%	9.2%	4.8%
7	6.3%	12.3%	4.5%
8	7.6%	12.0%	3.4%
9	3.7%	5.6%	3.3%
10	3.9%	6.3%	3.2%
11+	3.1%	3.4%	2.9%

**Exhibit 8—Benefit Utilization Status A**  
Full Surrender Rates by Duration and Size of Account Value at Beginning of Year (AV BOY) in \$1,000s

Duration	Overall	AV BOY 10	AV BOY 25	AV BOY 50	AV BOY 100	AV BOY 250	AV BOY 500
1	0.9%	2.5%	1.4%	1.0%	0.7%	0.6%	0.6%
2	1.1%	3.1%	2.0%	1.3%	0.9%	0.8%	0.8%
3	1.8%	4.3%	2.5%	2.0%	1.6%	1.4%	1.4%
4	4.1%	6.5%	4.7%	4.2%	4.0%	3.5%	3.9%
5	5.0%	7.0%	5.8%	5.1%	4.9%	4.1%	4.5%
6	5.7%	8.5%	6.6%	5.8%	5.5%	5.0%	4.8%
7	6.3%	9.4%	8.0%	6.3%	6.0%	5.2%	5.2%
8	7.6%	12.3%	7.5%	8.1%	6.9%	7.4%	5.3%
9	3.7%	8.8%	5.4%	3.6%	3.8%	2.8%	2.6%
10	3.9%	3.2%	4.4%	3.8%	3.1%	4.3%	4.5%
11+	3.1%	1.2%	7.7%	3.4%	3.0%	2.7%	1.2%

**Exhibit 9—Benefit Utilization Status A**

Full Surrender Rates by Duration and Back-Loaded AV with GLWB, Investment Restrictions, ITM > 100 percent, AV > \$50,000

Duration	Overall	Back-Loaded, IR, ITM>100%, AV>\$50K
1	0.9%	0.6%
2	1.1%	0.9%
3	1.8%	1.2%
4	4.1%	1.7%
5	5.0%	2.2%
6	5.7%	3.4%
7	6.3%	4.1%
8	7.6%	3.8%
9	3.7%	3.3%
10	3.9%	4.2%
11+	3.1%	1.8%

**Exhibit 10—Benefit Utilization Status B**

VA with GLWB-Level of Withdrawal and Duration

Duration From Issue	Under 75%	75%-90%	110%-125%	Over 125%	Grand Total
4	3.8%	1.2%	0.7%	6.1%	3.9%
5	6.3%	1.0%	0.8%	7.7%	5.5%
6	6.8%	1.2%	1.1%	7.4%	5.8%
7	10.2%	2.5%	2.2%	9.8%	8.4%
8	8.5%	2.5%	2.0%	7.0%	6.8%
9	8.9%	2.6%	2.0%	6.0%	6.8%
10	11.1%	4.1%	1.8%	6.7%	8.3%
11+	8.9%	3.3%	1.0%	7.7%	7.5%

**FULL SURRENDER EXPERIENCE BY RICHNESS OF BENEFIT**

Benefit prominence as exemplified by richness of benefit and higher rider fees, fewer investment restrictions, and larger account values, produces a strikingly different pattern of full surrenders as compared to the overall experience for these contracts. For example, consider Exhibit 9 that compares the overall surrender experiences with the experience of contracts with greater benefit prominence (contracts that are back-end loaded), with fewer investment restrictions, ITM >= 100 percent, and account value >= \$50,000.

To the extent that a richer benefit may be more sensitive to variations in full surrender rates than more modest benefits, these differences in full surrender experience can have important ramifications for pricing and reserving.

**FULL SURRENDER EXPERIENCE BY WITHDRAWAL LEVEL (BENEFIT UTILIZATION STATUS B)**

Contracts in benefit utilization status B are exemplified by the contract holder taking withdrawals at levels significantly higher or significantly lower than the maximum guaranteed withdrawal amount according to the terms of the GLWB.

Therefore, perhaps to address an urgent need for funds, the contractholder has withdrawn money from the contract, but not in the sense of taking regular income.

Exhibit 10 illustrates the impact of the level of withdrawal as a percentage of the GLWB maximum withdrawal amount, as well as the impact of duration for contracts in this status.

Note that the 90 percent to 110 percent band is excluded. As stated previously, withdrawals in this band are considered by both Ruark and LIMRA to represent utilizations of the GLWB.

While the Grand Total full surrender rates in Exhibit 10 are somewhat comparable to the corresponding full surrender rates by duration from issue in the Grand Total column of Exhibit 3 (Benefit Utilization Status A), the variation by withdrawal level is significant. Note also that the surrender rates in the later durations in Exhibit 10 are much higher than the corresponding rates in Exhibit 3.

Care must be taken in modeling contracts in this benefit utilization status, perhaps more than either of the other two contract statuses. These contract holders may be more varied in their motivations for taking specific actions. Some may be withdrawing money to deal with a

current, urgent economic issue while others may simply be using their annuity as an occasional source of additional income.

**FULL SURRENDER EXPERIENCE BY ATTAINED AGE (BENEFIT UTILIZATION STATUS C)**

While the “duration” in Exhibit 11 is measured from issue for consistency with the general structure of base surrender rates, it may also be useful to examine experience for contracts in Status C by increasing ITM and duration from the start of GLWB utilization. Just before and after utilization, the degree of ITM-ness is similar, but as withdrawals are taken over several years, the account value decreases until it may reach zero. At that point, there would be no cash alternative for the contract holder and surrenders should be zero.

**STEP 2: Construct a simple predictive model to estimate the impact of changes in these factors on base experience**

Based on the full data exploration, from which we provided some examples above, the following factors were identified as potential predictors in the modeling process.

- Benefit utilization status
- Policy Duration
- Attained Age of Policyholder
- Market (qualified, non-qualified)
- Surrender Charge Level
- In-the-Money (ITM) of the guarantee

**Exhibit 11—Benefit Utilization Status C**

Full Surrender by Attained Age and Duration after the start of GLWB utilization

Duration From Issue	Ages						Grand Total
	Under 60	60-64	65-69	70-74	75-79	80+	
1	1.3%	0.4%	0.3%	0.3%	0.3%	0.3%	0.3%
2	1.3%	0.6%	0.4%	0.3%	0.2%	0.1%	0.4%
3	1.1%	0.5%	0.4%	0.3%	0.4%	0.4%	0.4%
4	2.5%	1.4%	1.0%	0.8%	0.9%	0.9%	1.0%
5	1.2%	0.8%	0.6%	0.6%	0.6%	0.7%	0.6%
6	2.2%	0.9%	0.5%	0.5%	0.6%	0.7%	0.6%
7	1.8%	1.5%	0.7%	0.9%	0.8%	1.1%	0.9%
8	5.3%	0.8%	1.4%	1.8%	0.5%	0.3%	1.2%
9	5.9%	1.3%	0.3%	0.3%	1.0%	0.7%	0.6%
10			0.5%	0.9%	1.8%		0.7%
Greater than 10 yrs						3.1%	0.5%
<b>Total</b>	<b>1.7%</b>	<b>0.8%</b>	<b>0.6%</b>	<b>0.6%</b>	<b>0.5%</b>	<b>0.6%</b>	<b>0.6%</b>

- Account Value Size
- Distribution Channel
- Investment Restriction Indicator
- Current withdrawal as percent of maximum withdrawal level (for Status B only)
- Share Class (a proxy for product design: back-loaded, front-loaded, no load)
- Issue Age of the Policyholder
- Policy Charge Level (M&E)
- Size of VA with GLWB block/Company Indicator

A separate model selection process was implemented for each of the three benefit utilization statuses described above. Using SAS/Stat, R, and KNIME modeling tools, the selection process considered generalized

linear models (GLMs), logistic regression, and decision tree family model forms. As part of the process, variable reduction was employed to limit the number of independent variables in each model to the extent possible without giving up significant model accuracy.

The GLM model considers a continuous response variable form, so in building a GLM model for the three benefit utilization statuses the response variable was set equal to the “rate of full surrenders.”

For the logistic regression and decision tree family models, the response variable takes the form of a binary result. So the response variable (surrender) is equal to zero if the model predicts a particular policyholder will not take a full surrender and is equal to one if the model predicts a particular policy-

holder will take a full surrender during the experience period.

For each model form considered, each of the three datasets (representing each of the three benefit utilization categories) was randomly split into model training and model validation subsets using 70 percent of the data for training and 30 percent for validation purposes. Model fit, significance of predictors, accuracy of prediction, and validation results were all considered in the final model selection process.

For the logistic regression and decision tree models, Table 2 indicates the primary statistic considered in selecting a particular member of the model family. The “Concordance Statistic” (c statistic) represents the percentage of the time that a model correctly predicts an “event”/“non-event” and is re-

**Table 2**

Logistic Regression and Decision Tree Model Statistics

	Benefit Utilization Status A		Benefit Utilization Status B		Benefit Utilization Status C	
	Logistic Regression	Decision Tree	Logistic Regression	Decision Tree	Logistic Regression	Decision Tree
c statistic	.77	.70	.75	.68	.80	.73

lated to the “Receiver Operating Characteristic” curve.

For the GLM model family, a Poisson distribution was assumed and Table 3 shows the R-squared values for the models in the GLM family selected for consideration. R squared represents the percentage of the total variance in the response variable explained by a particular model.

Consideration of the model fit and validation results as well as the ease of application to an implementation plan, led to the selection of the following models for each of the benefit utilization status populations (Table 4).

Logistic regression is appealing in that it allows for a more straightforward implementation of the model results to a typical actuarial model.

Finally, each of the selected models was run to predict results of the response variable for the validation datasets and accuracy of predictions were reviewed across the models. Model sensitivity and specificity were in the range of 77–82 percent and 67–70 percent respectively. And, based on a 70 percent cut off level, full surrenders are predicted accurately by the above models for between 77–82 percent of the policies.

**Table 3**

GLM Model Statistics

	Benefit Utilization Status A	Benefit Utilization Status B	Benefit Utilization Status C
R squared	.72	.69	.81

**Table 4**

Selected Models for Variable Annuity with GLWB Rates of Full Surrender

Benefit Utilization Status A	Benefit Utilization Status B	Benefit Utilization Status C
Logistic Regression Predictors: policy year surrender charge level ITM account value size attained age distribution channel	Logistic Regression Predictors: policy year surrender charge level withdrawal as % of max account value size attained age distribution channel	Logistic Regression Predictors: market attained age

**STEP 3: Use the predictive model to develop a dynamic adjustment to base experience assumptions**

The results of the data exploration and model selection process led us to select the following factors to include in the base tables of full surrender rates:

- Benefit Utilization Status A: policy year and surrender charge level;
- Benefit Utilization Status B: attained age group, surrender charge level and distribution channel; and
- Benefit Utilization Status C: attained age group and market.

Note that the above selections may be different at the individual company level.

Also, it is important to consider that in applying this process, the user should avoid the temptation to “over model.” For example, for contracts in post-GLWB utilization status (Status C above), a base full surrender assumption is likely sufficient. For these contracts, the industry data does not indicate any significant impact on this group from dynamic factors, and the experience data is credible at the industry level. However, this statement is made with the caveat that considering the post-GLWB utilization contracts with respect to duration

from the GLWB utilization data may produce additional insights about the dynamic nature of those surrenders.

Based on the modeling results, the following formulas are used to predict the probability of a full surrender (that accounts for key dynamic factors) for contracts in Benefit Utilization Statuses A and B. For contracts in Benefit Utilization Status C, only base full surrender tables appear to be necessary at this point in time.

CONTINUED ON PAGE 12

**Probability of Full Surrender =  $[e^{(\text{sum of } B_i \cdot X_i)}] / [1 + (e^{(\text{sum of } B_i \cdot X_i)})]$**

where the  $B_i$  are the maximum likelihood estimates for the logistic regression models and are shown in the tables below and the  $X_i$  are the parameter values.

**Table 5**

Benefit Utilization Status A  
Maximum Likelihood Estimates

Parameter	Parameter Value	Maximum Likelihood Estimate	Probability > Chi Sq
Intercept		-2.5052	<.0001
Policy Yr		-0.0348	<.0001
distrib_ch	other/unknown	-0.0557	0.777
distrib_ch	Stockbroker/Wirehouse	0.2063	<.0001
distrib_ch	Independent Agents/Brokers	0.2038	<.0001
distrib_ch	Career Agents	-0.5480	<.0001
surr_chg level	9%	-0.3738	<.0001
surr_chg level	8/8.5%	-0.4953	<.0001
surr_chg level	7/6.5%	-0.5772	<.0001
surr_chg level	6%	-0.2305	<.0001
surr_chg level	5%	0.0479	0.064
surr_chg level	4%	0.0473	0.122
surr_chg level	3%	0.2828	<.0001
surr_chg level	2%	-0.1091	0.128
surr_chg level	1%	1.0366	<.0001
acct value	500K and over	-0.4981	<.0001
acct value	250K-499K	-0.4928	<.0001
acct value	100K to 249K	-0.3602	<.0001
acct value	50K to 99K	-0.1153	<.0001
acct value	25K to 49K	0.3508	<.0001
age_grp	Under 60	0.5409	<.0001
age_grp	85 and over	-0.2355	<.0001
age_grp	70-85	-0.4512	<.0001
ITMrange	Under 100%	-0.0717	0.001
ITMrange	150% and over	-0.00626	0.790
ITMrange	125% to 150%	-0.0328	<.0001
M_E_1 Level	Medium	-0.0267	0.0721
M_E_1 Level	Low	-0.1457	<.0001

**Table 6**

Benefit Utilization Status B  
Maximum Likelihood Estimates

Parameter	Parameter Value	Maximum Likelihood Estimate	P Value
Intercept		-2.9164	<.0001
Policy Yr		-0.0388	<.0001
withpct_range	Under 75%	0.7167	<.0001
withpct_range	Over 125%	0.5901	<.0001
withpct_range	75 to 90%	-0.4682	<.0001
distrib_ch	other/unknown	-0.0353	0.858
distrib_ch	Stockbroker/Wirehouse	0.2307	<.0001
distrib_ch	Independent Agents/Brokers	0.2253	<.0001
distrib_ch	Career Agents	-0.6278	<.0001
surr_chg level	9%	-0.3325	<.0001
surr_chg level	8/8.5%	-0.4305	<.0001
surr_chg level	7/6.5%	-0.5802	<.0001
surr_chg level	6%	-0.1767	<.0001
surr_chg level	5%	-0.00752	0.767
surr_chg level	4%	0.0249	0.420
surr_chg level	3%	0.2786	<.0001
surr_chg level	2%	-0.0830	<.0001
surr_chg level	1%	0.9097	<.0001
acct value	500K and over	-0.4270	<.0001
acct value	250K-499K	-0.4523	<.0001
acct value	100K-249K	-0.3431	<.0001
acct value	50K-99K	-0.1210	<.0001
acct value	25K-49K	0.3185	<.0001
age_grp	Under 60	0.4332	<.0001
age_grp	85 and over	-0.1353	<.0001
age_grp	70-85	-0.4076	<.0001

We have included the Wald Chi Squared test significance values in the last column of Tables 5 and 6. Based on this information, there are some areas for model simplification and this can be considered in allowing for a simpler implementation process.

These formulas produce a total full surrender rate. For implementation purposes, the dynamic surrender adjustments could then be estimated as the percent differences, positive or negative, between the modeled total full surrender rate and the modeled total full surrender rate by dynamic factor level (i.e., ITM, account value size, and/or withdrawal percent of the maximum level) for each of the base table rates.

### APPLY THE PROCESS AT THE COMPANY LEVEL

Experience aggregators (or Statistical Agents as the PBR Valuation Manual refers to them) such as LIMRA and Rurark collect certain data fields that are common across most companies offering a particular product or benefit. However, in our analysis, company indicator was one of the most predictive factors for experience at the industry level. This indicates the importance of applying any such process at the individual company level to the extent possible.

If a company has a significant amount of VA with GLWB experience, there are opportunities at the company level to apply the analytical roadmap outlined in this article using actual company data to walk through the process, including

Key factors that drive experience should be identified ... and used to adapt the experience to a particular situation.

data exploration and predictive modeling, to develop a company level dynamic surrender function for VAs with GLWBs. Companies can examine additional data fields that may have significant predictive value and are available at the company level but not necessarily at the industry level. There will also be a need to evaluate the credibility of company experience. If Actuarial Guideline 43 (AG 43) is applicable to the particular situation, the credibility of company experience will impact the confidence interval in setting prudent best estimate assumptions per Section 3.B.8 and, if there is not relevant, credible historical data, the credibility of company experience should be considered in developing the plausible range as specified in Appendix 9.1 of AG 43.

If the company does not have a significant amount of VA with GLWB company experience, then industry experience can be used as the basis for the process with adjustments for differences in relevant company factors related to distribution channel, product design including investment restrictions, and so forth.

### CONCLUSIONS

1. VAs and FIAs with GLWBs and GLIBs, respectively, have much lower full surren-

der rates than VAs and FIAs without those benefits.

2. VAs with GLWBs have very different surrender experience based on benefit utilization status with respect to the GLWB: the highest full surrender rates are seen on contracts for which withdrawals have been taken, but the GLWB not yet utilized. From Exhibit 2, surrenders for contracts that have utilized the GLWB are usually less than 1 percent by duration from issue. For VAs with GLWBs without any withdrawals under the contract to date, the surrender rates are in between the other two categories, but the pattern of surrenders can vary significantly by a number of factors, some affecting the prominence of the GLWB.

3. Industry data should be used with care, not relying on simple averages of overall experience across contracts in different benefit utilization statuses. Key factors that drive experience should be identified (if possible at the company level) and used to adapt the experience to a particular situation.

4. Even a very simple predictive model can be a useful starting point to bring dynamic structures into experience assumptions that are

strongly impacted by dynamic factors.

5. While industry data may provide a credible amount of experience data and a useful benchmark for comparison, where possible the unique profile of each company needs to be more fully recognized and additional information available at the company level should be incorporated into the process of developing the base full surrender rates and dynamic adjustments. ■



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# Update on Regulatory Developments

By Francis de Regnaucourt

This is a quarterly update on developments at the National Association of Insurance Commissioners (NAIC), the International Association of Insurance Supervisors (IAIS), the Federal Reserve and affiliated entities, as well as other groups who may get involved in insurance supervision, with emphasis on those that may be important to members of the Financial Reporting Section. In general, this update does not report on principle-based reserves, as they are usually covered elsewhere.

The NAIC does not have an in-person meeting during the second quarter, but the Life Actuarial Task Force (LATF) and its working groups continue to push many initiatives forward. At this writing, there are no new finished items, but recent initiatives include:

- Review of AG 43 to make it applicable to Contingent Deferred Annuities (CDA);
- Exempting CDA from non-forfeiture (this charge is being hotly disputed by the Center for Economic Justice (CEJ)); and
- Drafting a new Indexed Universal Life (IUL) Life Illustration Actuarial Guideline (currently exposed).

The NAIC held its International Forum in May, and the issue of International Capital Standards (ICS) was at the forefront of many discussions. The deadline for ICS has been postponed indefinitely, partly because there is such a strong division of views on how they should be developed.

Similarly, the NAIC's Com-Frame Development and Analysis Working Group held discussions on ICS at its March 2015 meeting. Even within the U.S., members showed a strong divergence of opinions.

At the same meeting, ex-Commissioner Hamm (ND), the NAIC (non-voting) representative to the U.S. Treasury's Financial Stability Oversight Council (FSOC), criticized FSOC's approach to insurance companies.

The Office of Financial Research (OFR), the research arm of the FSOC, issued its annual report at the end of 2014. Several issues in this report are directly relevant to insurance companies.

**NAIC INTERNATIONAL FORUM, WASHINGTON, D.C., MAY 21 AND 22, 2015**

Commissioner Lindeen (MT) opened the forum with a new definition of two time eras: BC



(before the crisis) and AD (after Dodd-Frank).

**Cybersecurity:** In April, the NAIC adopted a set of 12 guiding principles<sup>1</sup> for state insurance regulators on the protection of the insurance sector's data security and infrastructure.

A few interesting observations were made:

- The Federal Trade Commission singled out identity theft as the single biggest source of complaints they receive.
- The insurance industry is targeted by hackers because it is a larger user of personal information, both financial and personal (e.g., health) than virtually all others ("Why rob a 7-Eleven when you can rob a bank?").
- Customer data is a valuable commodity and should be accounted for, just like policyholder funds, according to the CEJ.

- Two areas of "low hanging fruit" for policyholder data security are data encryption and eliminating non-essential data.
- The cybersecurity industry is still not mature. Problems include: shortage of experts, the need for more cooperation, and proliferation of different sets of rules.

**Group Supervision:** The panel agreed that group supervision is a useful tool, but is not a substitute for entity supervision. The group view can obscure things like double leverage and specific risks at unregulated entities within the group.

One speaker from the Fed said that shadow insurance keeps him up at night. He was referring to reinsurance transactions within a group that move risks from one part of the group to another where regulation is less stringent, or disclosure requirements less transparent.

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The views—from panelists and audience members—broke down into two groups with very different positions on capital standards, summarized as follows:

- The NAIC is continually improving regulation and will continue to do so. It is better to continue the gradual change process than to make a sweeping change, which takes a long time and creates dislocation. The current tools, including ORSA, are sufficient to assess capital adequacy, and will continue to evolve as new situations develop.
- Adoption of a single set of ICS is necessary to avoid jurisdiction-shopping. The change in global markets, especially the growth in Asia and developing markets, requires standards that are truly international. Supervisory colleges need a common standard, even if it is developed and implemented gradually.

Two interesting questions came from the audience; there was no time for answers, though:

- Do the costs of meeting all these standards, which are rising quickly, justify the benefits?
- What authority do the supervisory colleges really have, and what authority do they really need?

**Centralized vs De-centralized Corporate Governance:** A panel of four speakers from the Dubai Financial Authority, a large U.S. P&C insurer, a U.S.-based insurer SIFI, and

the Dutch Central Bank discussed these two approaches to corporate governance. Salient observations:

- Recognition of local culture, while still meeting group-wide standards, is crucial. Regulatory colleges, by the same token, can best understand local culture by relying on local regulators.
- Governance is only as good as the behaviors of the people and the “tone at the top.” Better to evaluate outcomes than rely on prescriptive rules.
- Insurer representatives said that there was good cooperation between regulators and management, but politely expressed some frustration with the cost of complying, and with regulators’ perceived risk-avoidance bias in an industry that earns its profits by taking risks.

**Global Insurance Capital Standards:** The division of opinions was very similar to the NAIC session on Group Supervision, with a similar division of opinions. Panelists were: a New York State Senator who is president of the National Conference of Insurance Legislators (NCOIL), the CEO of the NAIC (a retired U.S. Senator), the secretary general of the IAIS, a law school professor, and a senior Insurance and Pensions expert at the European Union (EU). A few key observations:

- Solvency II got buy-in because the cost of having 28 different regulatory standards made the cost of

cross-border business prohibitive within Europe. Maximum harmonization (with few options by country) was chosen over a broad-brush approach.

- The huge growth in Asian insurance markets highlights the need for a truly global regulation tool beyond Europe and North America.
- Six U.S. states, if they were independent countries, would rank in the largest 20 countries in the world (this argument given in support of keeping state regulation in the U.S.)

#### NAIC COMFRAME DEVELOPMENT AND ANALYSIS WORKING GROUP

This working group is charged with developing national capital standards and representing the U.S. in the development of ICS. With respect to national standards, there were essentially two views among U.S. NAIC members:

- One group contends that the U.S. need not follow Europe or the IAIS standards for Globally Systemically Important Insurers (G-SII), pointing out that there are different issues and different business models at play. Support for this view is based on the demonstrated, long-term strength of the U.S. regulatory system and the possible unintended consequences of a global group capital standard.
- The other group argues that if U.S. insurers want to retain any relevance internationally

going forward, they need to comply with international standards. Supporters of this view point out that insurance customers are becoming more global and insurers are operating more globally, creating a need for a consistent global capital standard.

#### NAIC FINANCIAL STABILITY (EX) TASK FORCE

Adam Hamm, a former NAIC president, appeared before the Task Force, accusing the FSOC of regulatory malpractice. Hamm, who serves in a non-voting advisory capacity to the Council, voiced concern over the FSOC’s decision to designate MetLife as a SIFI and the overall FSOC process. At this writing, MetLife is contesting its designation as a SIFI.

Hamm indicated that FSOC members:

- Do not understand the NAIC’s requirements;
- Make decisions based primarily on the size of the company, ignoring other factors;
- Impose a virtually impossible burden of proof on insurers to dispute a SIFI designation;
- Presume implausible outcomes relating to the liquidation of assets in policyholder surrender scenarios;
- Do not recognize the positive impact of regulatory intervention by the states; and
- Fail to provide guidance to insurers about what the risks

are and how they can be mitigated.

## OFR ANNUAL REPORT

In late 2014, the OFR issued its 2014 Annual Report to Congress.<sup>2</sup> The OFR was established by the Dodd-Frank Act to support the FSOC with research and analysis of the financial system, including insurance. The report has three main sections:

- Analysis of threats to the financial stability of the United States,
- Status of OFR efforts in meeting its mission, and
- Key findings from OFR's research and analysis.

The report is excellent reading for anyone interested in the Financial Services industry, but we limit our coverage to two areas directly relevant to life insurers, even those that are not Fed-regulated. In his cover letter, the director of the OFR summarizes financial stability risks as follows:

“The three most important [risks] are excessive risk-taking in some markets, vulnerabilities associated with declining market liquidity, and the migration of financial activities toward opaque and less resilient corners of the financial system.”

## CAPTIVE REINSURERS

The report's analysis of threats to financial stability has three themes:

- excessive risk-taking during an extended period of low interest rates and low volatility;

- an increase in market fragility resulting in declining market liquidity and persistent risks of asset fire sales and runs; and
- migration of financial activity away from banks toward less regulated parts of the financial system.

The third theme (migration) has particular relevance to life insurers, especially those with captive reinsurers. The OFR lists the dramatic growth in captive reinsurers as one of its top concerns with life insurers. A paper entitled “Shadow Insurance,”<sup>3</sup> by Kojien (London Business School, Centre for Economic Policy Research) and Yogo (Federal Reserve Bank of Minneapolis) is summarized in the abstract below:

“Liabilities ceded by life insurers to shadow reinsurers (i.e., less regulated and unratified off-balance-sheet entities) grew from \$11 billion in 2002 to \$364 billion in 2012. Life insurers using shadow insurance,<sup>3</sup> which capture half of the market share, ceded 25 cents of every dollar insured to shadow reinsurers in 2012, up from 2 cents in 2002. Our adjustment for shadow insurance reduces risk-based capital by 53 percentage points (or 3 rating notches) and increases default probabilities by a factor of 3.5. We develop a structural model of the life insurance industry and estimate the impact of current policy proposals to limit or eliminate shadow insurance. In the counterfactual without shadow insurance, the average company using shadow insurance would raise prices by 10

to 21 percent, and annual life insurance underwritten would fall by 7 to 16 percent for the industry.”

Later in the report, (“Addressing Data Gaps”), the OFR lists three data concerns with captives:

- Statutory statements are publicly available for life insurers, but not for captive reinsurers;
- Incomplete disclosure of captives in SEC filings, especially on the use of parental guarantees to secure reserve collateral; and
- Offshore captives may have even less by way of substantive or disclosure requirements.

## SECURITIES LENDING AND REVERSE REPURCHASE AGREEMENTS

Securities lending and reverse repurchase agreements are not particular to life insurers, but many insurers participate to significant degrees. The FSOC considers securities lending and reverse repos a factor in determining the degree to which an institution is systemically important; it is mentioned specifically in the Basis for Determination of all three insurer SIFIs.

The primary concerns about securities lending and reverse repos are:

- Data gaps, especially in the bilateral repos markets (where transactions are settled directly between the parties, without a third party settlement bank);

- Dependence on short-term funding (which can dry up quickly in times of stress);
- Counterparty exposure; and
- Interconnections between participants.

“The repo market is ... susceptible to fire sales and runs when a borrower cannot roll over or renew short-term funding backed by collateral.”

Not everyone agrees with these assessments, but the OFR's contribution to the debate over regulation of insurers in the U.S. appears thoughtful and articulate. ■

## ENDNOTES

- <sup>1</sup> The guiding principles can be found at: [www.naic.org/documents/committees\\_ex\\_cybersecurity\\_tf\\_final\\_principles\\_for\\_cybersecurity\\_guidance.pdf](http://www.naic.org/documents/committees_ex_cybersecurity_tf_final_principles_for_cybersecurity_guidance.pdf)
- <sup>2</sup> The full report can be found at: <http://financialresearch.gov/annual-reports/files/office-of-financial-research-annual-report-2014.pdf>.
- <sup>3</sup> Swiss Finance Institute Research Paper No. 14-64. Available at SSRN: <http://ssrn.com/abstract=2320921>



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# FASB Deliberations on Accounting for Assumption and Discount Rate Changes

By Leonard Reback

The Financial Accounting Standards Board (FASB) met on May 21, 2015 to discuss its ongoing project to make targeted improvements to accounting for long-duration insurance contracts. The meeting was an education session, with no decisions made. However the Board appeared to narrow its choices as to how to implement previous decisions to update assumptions and current market discount rates for FAS 60, FAS 97 limited-pay and SOP 03-1 reserves.

The Board initially discussed four possible options for how to handle the net premium ratio (or benefit ratio for SOP 03-1) when reserve assumptions or current market discount rates are revised:

1. Lock in the net premium ratio—Under this approach the net premium ratio calculated at issue would remain locked in. To the extent the change in cash flow assumptions or discount rates causes the present value of future cash flows to change, the full amount is reflected in the change in reserves and in net income.
2. Prospectively unlock the net premium ratio—Under this approach the net pre-

mium ratio is unlocked as of the time of the cash flow assumption or discount rate change to the extent of the change in present value of future cash flows. Under this approach, assuming there are future premiums to be paid in the contract, there is no immediate impact to the reserve or to net income (at least if there is no premium deficiency). The full impact of the change emerges over future periods.

3. Retrospectively unlock the net premium ratio—This approach is somewhat intermediate between (1) and (2), and is similar to the way DAC is unlocked today for universal life-type contracts when assumptions change. Under this approach, the net premium is unlocked as if the cash flow assumption or discount rate change was known at the time the contract was issued. Assuming there are future premiums to be paid in the contract, some of the impact of the assumption or discount rate would impact the reserve and net income, while the remainder would revise the net premium ratio and emerge over time. More of the impact would flow through the reserve immediately for older

contracts than for newly issued contracts.

Retrospective unlocking would also presumably require truing up actual experience as it emerges differently than previous assumptions. Again, this is similar to universal life DAC calculations. Such truing up could mitigate volatility from actual experience deviations, which some may view positively (under a viewpoint that less income volatility is good) and others may view negatively (under a viewpoint that the full impact of actual experience should be reflected in income). Such truing up would likely significantly increase the cost of implementation, as it would essentially require all the current universal life DAC amortization mechanisms (creating cohorts, tracking experience, allocating experience deviation to cohorts) to be applied to FAS 60 contracts.

4. Prospectively unlock the net premium ratio for cash flow assumption changes but lock in the net premium ratio for discount rate changes—for some reason, this split approach was not discussed with retrospective unlocking for assumption changes.

During the discussion, a fifth approach came up. Under this approach, the net premium ratio would be locked in for purposes of reporting the reserve on the balance sheet, but retrospective unlocking would be used to determine net income. The difference between the two calculations would be re-

ported in other comprehensive income (OCI).

Neither prospective unlocking approach (with or without locking in the net premium ratio for discount rate changes) seemed to gain any traction with the Board. So staff seems to be focusing on and further developing the other three approaches:

- a. Lock in net premium ratio for all changes;
- b. Retrospectively unlock net premium for all changes; and
- c. Lock in for all change on balance sheet, retrospectively unlock for net income, with the difference through OCI.

## POSSIBLE EFFECTS OF THESE APPROACHES

For cash flow assumption changes, I think any of these approaches can be justified, although they have different costs and impacts to the financial statements. Lock in is probably the most practical to implement, while retrospective unlocking is probably the least practical, especially if true ups are required. Lock in would create the most income volatility when assumptions change.

However, for discount rate changes I think all of the approaches that seem to be under consideration have significant issues.

### *Lock in approach*

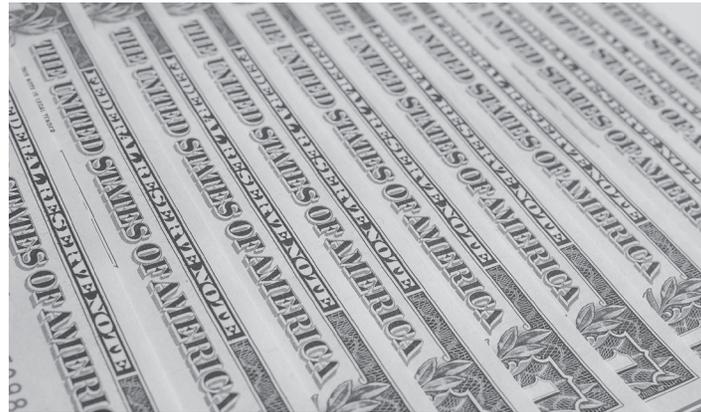
Under the lock in approach, net income could become very volatile. The full impact of assumption and discount rate changes will impact the

reserves on the balance sheet through net income. In some instances, a large loss could be shown in the current period for profitable products. That could be the case when there is an assumption or discount rate change that is adverse to the insurer, but not so severe as to wipe out all future profits. In that case, the full present value of the future cash flows from the change will be reported in net income currently, and the previously estimated profits will flow unaltered through net income in the future.

A benefit of this approach is that there may be a better match on the balance sheet between the fair value of invested assets and the liability discounted at a current discount rate. However, if the assets and liabilities are not very closely matched, this could result in significant volatility to net income. During the joint project between the IASB and FASB that led to the 2013 exposure draft, these impacts would have been reported in OCI.

#### **Retrospective unlocking approach**

Under a retrospective unlocking approach, there would be some offset to the impact of assumption changes, mitigating volatility to some extent. Retrospective unlocking would also mitigate volatility to the liability value from changes in discount rates. However, this is not necessarily desirable. Even after retrospective unlocking, a change in current market discount rates could still have a very large impact to the liability. But this impact would be smaller than the impact to fair value of a perfectly matched



asset portfolio. So the impact to the liability from changes in discount rates would not match income from assets on either an amortized cost basis or a fair value basis. There is no asset measurement model that would be consistent with retrospective unlocking. Thus, there would be substantial net income and balance sheet volatility resulting from this accounting mismatch, even to the extent there is a perfect economic match between assets and liabilities.

#### **Retrospective unlocking for net income/Lock in for balance sheet**

Using a hybrid approach may appear to address some of the concerns from using a pure retrospective unlocking approach or a pure lock in approach, but I do not think it does. There would be some benefits to such an approach. To the extent the assets and liabilities were economically matched, and to the extent the assets could be reported at fair value on the balance sheet, this approach would achieve the benefits of the pure lock in approach of matching the asset fair values with liability values on the balance sheet. And this approach

would mitigate some of the net income volatility from assumption changes, as per the pure retrospective unlocking approach. But this approach would still use retrospective unlocking for changes in discount rates when reporting net income. So we would still have potentially huge volatility to net income from mismatched accounting bases between assets and liabilities.

#### **Other possibilities**

Hopefully, FASB will recognize the issues created by the options currently on the table and will consider alternatives (perhaps by the time you read this). I hope they will consider solutions in which assumption changes and discount rate changes are treated differently. At the meeting, some Board members expressed practical concerns about splitting these effects (for example, a change in mortality assumption may impact the liability duration), but I don't think these should be particularly difficult to separate for FAS 60 or FAS 97 limited pay contracts in particular, and any interaction effects are likely to be small. If they consider applying different treatment to assumption changes versus dis-

count rate changes, that could permit them to unlock the net premium ratio for assumption changes (mitigating some volatility) while locking it in for discount rate changes (mitigating accounting mismatches with asset fair values). And since they seem to be willing to consider OCI, if they do lock in the net premium ratio for discount rate changes, perhaps they will permit the impacts to flow through OCI, avoiding much of the volatility from discount rate changes if assets and liabilities are not perfectly matched. ■

#### **ADDENDUM**

At their meeting July 24, 2015, FASB addressed these issues. FASB's tentative decision on discount rate changes was to lock in the net premium ratio, with the impact of the change reported in other comprehensive income (OCI). The tentative decision on other assumption changes was to retrospectively unlock the net premium ratio, with the impact reported in net income. The retrospective unlocking would cover truing up actual versus expected experience deviations. All reserve changes, whether from discount rates, assumption changes, or experience, would only be reported in 4th quarter.



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# No-See-Ums

By Henry Siegel

I spent the last full week of June vacationing in Belize. The day I arrived, I covered myself in suntan lotion and bug repellent. The next day I went out and bought anti-itch medication because the repellent hadn't worked. I essentially spent large parts of the rest of the week itching. The culprits in this were no-see-ums, also called sand flies. The problem with these bugs is, as their name suggests, you don't know they're there until they bite you. When they do, the itch stays for longer than you would think. (By the way, notwithstanding the itching I really enjoyed the diving and spelunking I did in Belize—see photos.)

I thought of the International Accounting Standards Board (IASB) as I was going through this torture. They, too, are enduring a lot of suffering. Why? Because so many times they have thought they had solutions to the problems of accounting for insurance contracts only to find some unexpected problem that bites them.

They thought using Other Comprehensive Income would solve the problem of getting assets and liabilities on the same basis. It didn't. They thought that mirroring would work for

participating contracts. It didn't work for the types of contracts most important to the European industry. They are now proposing the use of the Variable Fee Method for certain participating contracts. I predict they will find this also doesn't completely work, as it was designed to fit those certain European contract types and excludes several types of contracts that are important elsewhere in the world, such as Universal Life.

The problem with all these solutions is the more they move away from a principle basis toward a solution that works for particular types of contracts, the more they find it doesn't work for other types. Those other types of contracts then arise like no-see-ums to bite the nearest person. The past quarter, the board seems to have settled on moving forward with the Variable Fee Method. We'll see what no-see-ums turn up when the industry has a chance to completely study it.

Again this quarter, the IASB held mainly educational sessions on the insurance contracts project. In fact, they didn't discuss the subject at all in April. They did, however, have an important tentative decision making session at the end of June.

## MAY EDUCATION SESSION

On May 19, 2015, the IASB held an education session in which it discussed additional implications of the variable fee approach for certain participating policies with respect to the following issues:

- mutualization;
- revenue; and
- transition requirements.

The most interesting discussion to me was on "mutualization." This topic came up for a variety of reasons, not necessarily to deal with mutual insurers. In Europe, there are blocks of policies where dividends are determined based on the performance of the entire block. The block may include issues of many years and many types of contracts with the key attribute

being that 90 percent (or some other high percentage) of total profits are paid out to policyholders. For these blocks, the concept of losses being measured at the policy level, as the board has previously discussed, does not work well since losses on one set of policies can be offset by profits on another. This offsetting is the mutual property that the board discussed. Discussions revolved around what requirements a block has to meet to allow such offsetting of profits.

One concern is that the board discussed the need for policyholders to be "aware" of this arrangement or that it is included in the policy language. Unless an insurer wrote its policies in the specific language being discussed, the business may not be included even if in practice the





contracts were identical. How this will affect U.S. policies remains to be seen.

In addition, the IASB also discussed:

- the treatment that would apply to contracts with participation features that would not be accounted for using the variable fee approach;
- whether to provide an accounting policy choice when an entity presents interest expense—to use the effective yield approach or the current period book yield approach; and
- an update from the staff on the interaction between International Financial Reporting Standard 9 (IFRS 9) Financial Instruments and the Insurance Contracts project.

As usual, no decisions were made; however, the discussion about IFRS 9 was to continue the following quarter.

## JUNE MEETINGS

In June, there was an education session and then a decision making session.

The education session focused primarily on the issue of IFRS 9 changes to asset valuation being implemented before the insurance contracts standard is finished. This could cause asset/liability mismatches since choices are required to implement IFRS 9 that might be different if the liability valuation is simultaneously changed.

After extensive discussion, including recognition of the complexity of deferring the introduction of IFRS 9, the staff agreed to look at possible amendments to the current IFRS 4 to ameliorate the situation. Those possible changes include:

a) introduction of shadow accounting when,

- (i) gains or losses from assets don't directly affect the measurement of liabilities, or

- (ii) when those gains and losses would be attributable to the insurer and not the policyholder.

b) permitting insurers to recognize an adjustment for the differences between the change in value of the assets under IAS 39 and the change in their fair value under IFRS 9, if those changes are recognized in profit or loss.

Several board members expressed support for these ideas and the staff will develop them further after discussion with users. We'll see what no-see-ums arise when they report back.

At the decision making session the board tentatively approved use of the variable fee approach for certain par contracts that have been discussed since the beginning of the year. This is how the staff update describes it:

### *“Variable fee approach for direct participation contracts*

“The IASB tentatively decided that, for insurance contracts with direct participation features, it would modify its general measurement model for accounting for insurance contracts so that changes in the estimate of the fee that the entity expects to earn from the contract are adjusted in the contractual service margin. The fee the entity expects to earn from the contract is equal to the entity's expected share of the returns on underlying items, less any expected cash flows that do not vary directly with the underlying items. ...

“The IASB tentatively decided that contracts with direct participation features should be defined as contracts for which:

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**ENDNOTES**

<sup>1</sup> <http://media.ifrs.org/2015/IASB/June/IASB-Update-June-2015.html#1>

<sup>2</sup> *ibid*



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- a. the contractual terms specify that the policyholder participates in a defined share of a clearly identified pool of underlying items;
- b. the entity expects to pay to the policyholder an amount equal to a substantial share of the returns from the underlying items; and
- c. a substantial proportion of the cash flows that the entity expects to pay to the policyholder should be expected to vary with the cash flows from the underlying items.”<sup>1</sup>

profit or loss on the basis of the passage of time.”<sup>2</sup>

These decisions leave lots of holes for actuarial practice to fill. For instance, what is a “clearly identified pool of underlying items”? Does the entity need to hold the assets or is an index acceptable? Is a proportion of a defined pool OK? If so, can that proportion vary over time?

How does one recognize the CSM over time for a contract without a specific term (e.g., for an immediate annuity)? One suggestion is that if the maximum life of the policy anticipated is 50 years, then 2 percent of the CSM is released each year plus the CSM on any policies that terminate during the year. This would make the actual release of the CSM highly dependent on policy termination and for some policy types

make it very front-end loaded. For others, like Long-term Care or immediate annuities, it might make profit recognition very deferred.

All of this makes it necessary for well thought-out actuarial guidance on implementing the eventual standard. The International Actuarial Association has more than 20 working groups looking to produce International Actuarial Notes on these and other subjects. This reminds us again why

***Insurance Accounting is too important to be left to the accountants! ■***

At the same meeting, the IASB tentatively decided that “for all insurance contracts with participation features, an entity should recognize the contractual service margin (CSM) in

# IAA Report

By Jim Milholland

It's been business as usual at the IAA since the last report. While there is much activity, agendas have not changed much and little has come to completion. There is, however, news of sorts coming from the conversations in the hallways that take place during the meetings.

To recap, major activities of the Insurance Accounting Committee (IAC) and the Education and Practice Subcommittee (EPS) include:

- Writing International Actuarial Notes (IANs) on the new accounting standard—IFRS for insurance. There are 25 topics that will be combined into an as-of-yet undetermined number of notes. When done, the IANs will provide fairly comprehensive guidance on the accounting standard. When they will be done is of course a function of the progress of the IASB. Much of the work on the IANs to date has been updating existing IANs on the current IFRS 4 and otherwise opportunistically beginning writing where the direction of the IASB with respect to the new standard is fairly clear.

- Working with or developing relationships with other supranational organizations. The IAA has a memorandum of understanding with the IASB, and a member of the IAC, Micheline Dionne, is a member of the consultative advisory group, the IFRS Advisory Council. The IAC may have some involvement with the IASB's research project on discount rates. Another member, William Hines, is a member of the consultative advisory group to the International Auditing and Assurance Board. Members of the IAC and members of the Pensions Committee have regular communications with staff of the International Valuation Standards.
- Publishing a monograph on the adjustment for risk. The firm preparing the monograph, Deloitte, is progressing well, although there is the standard caveat that the monograph cannot be finished until the IASB completes the insurance standard.

The Insurance Accounting Task Force of the Actuarial Standards Committee continues with the development of an

Notwithstanding the silver lining, one wonders if the number of reports and analyses is not creating overload ...

International Standard of Actuarial Practice that will relate to the new IFRS standard on insurance. While very active, the Task Force is, like the EPS, able to progress only so far without a final IFRS for insurance.

The silver lining on the fact that IFRS continues to get pushed into the future is the fact that actuaries are already stretched thin with reporting and compliance requirements. Perhaps by the time that the new IFRS for insurance comes into effect, companies will be in a better position to deal with the requirements. They likely will have actuarial platforms, developed for other purposes—such as Solvency II—that they can leverage. This includes not only projection systems, but the requisite tools and procedures around the cash flow projects. These are the analyses and considerations that support the inputs—mortality, lapse, and expense, to name a few—that likely can be used for IFRS as well. Inputs may not be the same, but there should be a rationale for differences, and one is likely a modification of the other. Most importantly, a common robust model office can be used for all the projections.

Notwithstanding the silver lining, one wonders if the number of reports and analyses is not creating overload on actuar-

ies. Actuarial departments are stretched to produce figures for multiple purposes. The number of analyses and the reporting deadlines can create an operating environment that is oriented to compliance; i.e., meeting deadlines. The value that might be derived from the reports may be lost in the rush to meet the next deadline. Too much time is spent producing figures and too little time is spent understanding them.

Do you share my concern? Have I over-reacted to the number of requirements, or do you, like me, wonder what would really be beneficial to the various stakeholders? Which reports and which analyses would address the information needs of shareholders and regulators? Certainly actuaries want to be responsive to the needs of the various parties, but shouldn't we be more involved in shaping the standards? While there is not a forum for responses, comments to me or letters to the *Financial Reporter* are welcome. Let us know what you think. ■



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# Covering the Bases

By Tom Herget

Have you possibly been overwhelmed by the many changing and emerging accounting bases that are encircling us? If retirement is not an option, then you need to be on top of not only what you will be reporting, but your competitors, too.

To support this need, the Society of Actuaries Financial Reporting Section along with the Committee on Life Insurance Research and the Reinsurance Section commissioned a study to compare the emergence of earnings on five different accounting bases. Ernst & Young stepped up to the plate and delivered a solid hit with the recently-released study, “Earnings Emergence: Insurance Accounting under Multiple Financial Reporting Bases.” It can be found at <https://www.soa.org/Research/Research-Projects/Life-Insurance/2015-earnings-emergence.aspx>.

Rob Frasca managed the project; his lineup included Asad Khalid, Francis Rahil, Bruce Rosner and Joy Zhang. Sam Keller was project oversight group chair.

While the research report is more than a hundred pages long, its graphic display of results makes it an easy read. The

team took two vanilla products, term life and fixed deferred annuity, through baseline and alternate scenarios, and projected balance sheets and income statements. The bases calculated are US Statutory, US GAAP, Canadian valuation (CALM), IFRS and Solvency II. The term product has both direct and ceded. The ceded illustra-

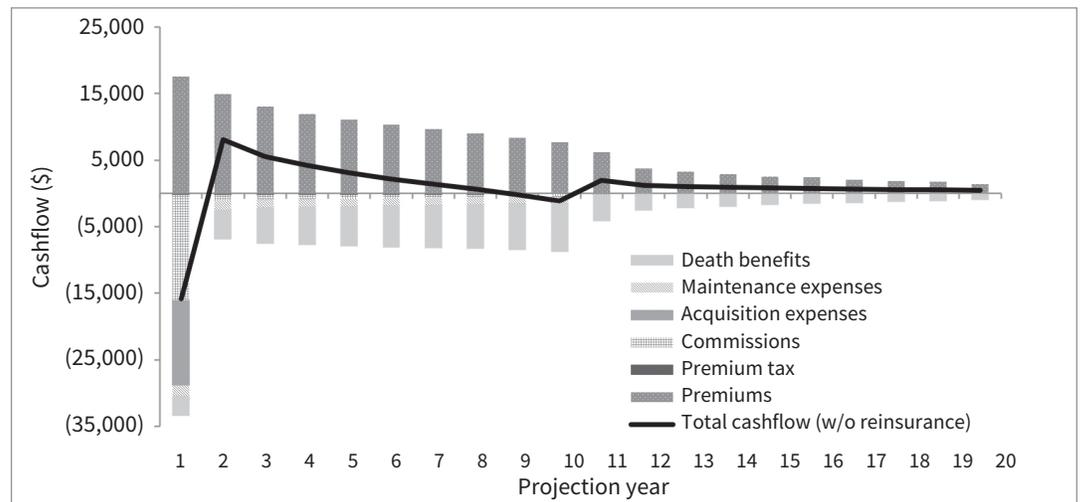
tion shows both a regular co-insurance arrangement and the results if reinsured to a captive.

The objective of the report is to help the reader interpret and compare results under these accounting regimes.

Here are some sample graphs from the report:

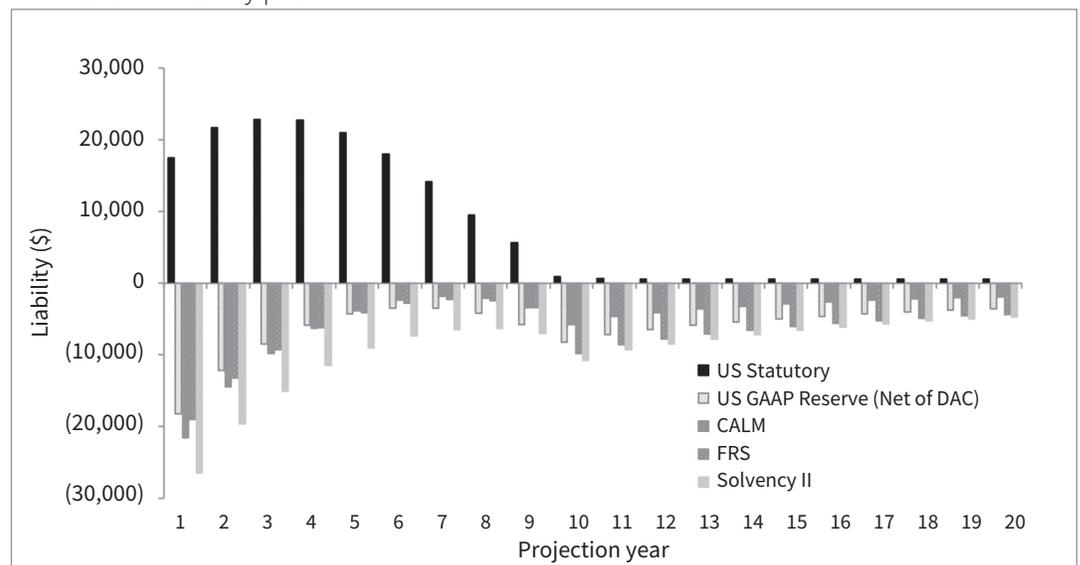
**Figure 1**

Term Life cashflows



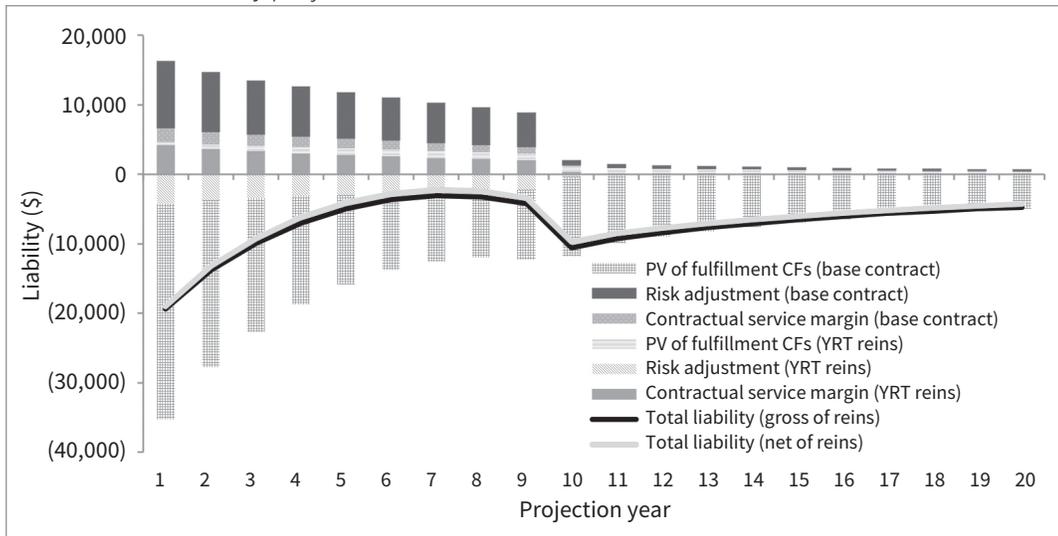
**Figure 2**

Term Life net liability positions

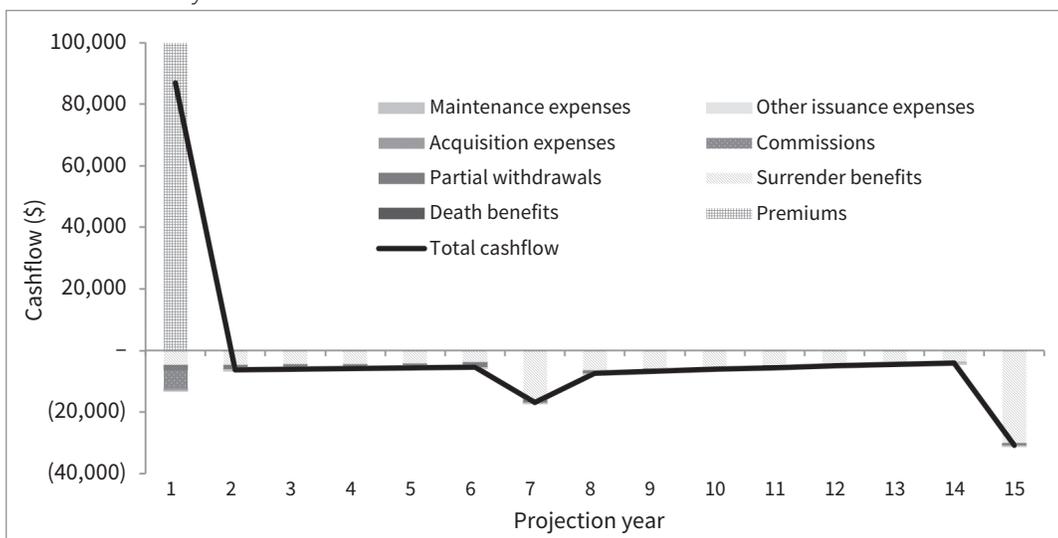


There are more than 50 graphs illustrating important levels and comparisons of liabilities and earnings.

**Figure 3**  
Term Life IFRS liability projections



**Figure 4**  
Deferred Annuity cash flows



The variation in product design causes the differentiating features of the measurement bases to manifest themselves quite differently across the two products.

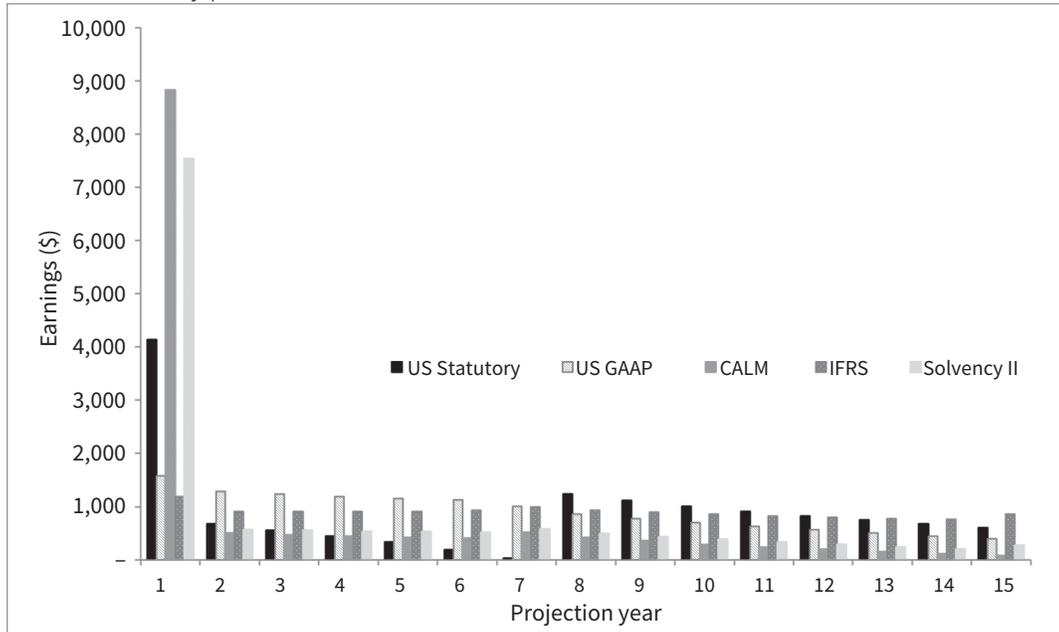
For term life, the two balance sheet focused bases (U.S. Statutory accounting and the market consistent balance sheet) show the most extreme results. U.S. Statutory exhibits large losses at issue due to a conservative rules-based formula designed to protect solvency, while the market consistent balance sheet shows “profits” at issue, as it is unconstrained by any need for conservatism in a market-value world. The other bases lie somewhere in between, with US GAAP showing perhaps the least volatile income due to its tying of earnings emergence to premium income, with CALM and IFRS emergence tied to the less predictable provisions for adverse deviation and provisions for risk respectively.

By contrast, for the annuity product, U.S. Statutory and the market consistent balance sheet show more front-ended income emergence than either US GAAP or IFRS. This, however, is a consequence of the construct of the various bases. The lack of significant insurance risk elements provides little opportunity to incorporate pads within the U.S. Statutory valuation while the market consistent balance sheet shifts to be slightly more conservative, ef-

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**Figure 5**

Deferred annuity pre-tax income



ffectively penalizing the product for its real-world foundation for crediting interest. CALM front-ends the earnings further still, it finding nothing significant to pad while adhering to a real-world view of investment returns that renders it less conservative, at least in that regard, than Solvency II. US GAAP and IFRS, on the other hand, are content to wait and recognize earnings as revenue or release-from-risk emerge. There is a more deliberate measurement of income arising from bases that place paramount importance on earnings emer-

gence rather than treating it as an afterthought.

This is merely a high-level summary of the observations made. The full report shows the projected income emergence on each basis for baseline runs as well as for a variety of sensitivity tests. Differences in earnings emergence can be subtle and a thorough analysis of the modeled projections is needed to appreciate their sources. Even at that, this study can only hope to present in broad terms and for an admittedly small selection of products the differences in reporting that

the various measurement bases may generate.

Don't hesitate to access this study. The first one hundred to download it will be able to follow any quarterly earnings conference call in almost any country. ■



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# Update to U.S. EU Solvency Assessment Research

By Tom Herget

PwC has completed its assignment to update its original research on Life Insurance Regulatory Structures and Strategy. This research compares the regulatory methods used to assess solvency between the European Union (EU) and the United States. It also includes a comparison to the Insurance Core Principles (ICP) promulgated by the International Association of Insurance Supervisors (IAIS).

The original work was released in May 2013. Enough activity has transpired to warrant an update. Most notably, there were delays to the implementation of the Solvency II regime. The EU tested and agreed on a package of measures in the Solvency II framework, particularly the approach to balance sheet volatility for long-term insurers. There were also amendments to the Solvency II regulations on equivalence which has implications for U.S. insurers with EU parents.

In terms of global developments, the IAIS moved forward with its development of the common framework for large insurance groups. Basic capital requirements were developed and a consultation on a global capital standard was launched in late 2014. This is likely to

have wide-ranging consequences for the largest global insurance companies.

In the fall of 2014, PwC, with contributions from Brian Patton, Dana Hunt, Richard Isherwood, and David Scheinerman, was re-recruited to create the sequel.

The original paper segmented the content into six sections:

- An introduction including historical context, environmental influences and developments underway;
- Financial sector activities including the life company environment in the U.S. and EU;
- Overview of current and expected changes in reserving and capital standards in the EU and U.S.;
- Valuation implications, including capital levels, total balance sheet, liability valuation, capital additions, equivalence internal models, supervisory implications and opinions;
- Impacts on product development; and
- Risk management and governance.

The EU tested and agreed on a package of measures in the Solvency II framework ...

This research report is bolstered by an appendix that lays out the differences between the IAIS ICPs, the U.S. solvency regime, and the EU's Solvency II framework.

Highlights of the substantive revisions are:

- Section 3.1 contains an update to reflect developments in ComFrame including the proposed International Capital Standards and the treatment of large insurance groups. There were updates to reflect the latest position of the International Accounting Standards Board (IASB) and the Financial Accounting Standards Board (FASB) insurance contract projects, and the Federal Reserve supervision for banks and Systemically Important Financial Institutions (SIFI).
- Section 3.2 now includes an update from the July 2014 paper on the EU-U.S. insurance project.
- Section 4.2.1 has been updated for the August 2013 white paper on Solvency Modernization Initiative (SMI).
- Section 4.2.2 contains recent developments in Solvency II. This includes the Long-Term Guarantee LTG package, transitional measures, recovery period and

equivalence. It also includes the Capital Requirements Regulation developments impacting structured securitizations.

- Section 5.1 has been updated for the recovery period of insurers under Solvency II (SII).
- Section 5.6 includes the latest developments on equivalence.
- Appendix A contains an update to reflect implementation timetables as well as the SII discount rate.
- Appendix C includes the new acronyms.
- Appendix E contains the status of EU and G20 countries.

The SOA salutes the researchers and encourages members to spend time reinforcing, if not learning how, the two sides of the Atlantic measure insurer solvency. ■



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