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PBA Corner

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On August 2, the National Association of Insurance Commissioners (NAIC) Life Actuarial Task Force (LATF) adopted the Valuation Manual (VM) in its entirety. On August 17, the NAIC Life Insurance and Annuities (A) Committee also adopted the VM. During September and October 2012, LATF continued to hold conference calls on topics which remained open, primarily in VM-20, specifying the minimum reserve requirements for life insurance. On Dec. 2, 2012, during the NAIC Fall National Meeting, the required super-majority of NAIC members voted affirmatively to adopt the Valuation Manual.

Looking forward, both the Standard Valuation Law (SVL), as revised in 2009 to allow for a VM specifying principle-based reserves, and the VM itself are ready to be presented to state legislatures during calendar year 2013. Section 11 of the SVL details the necessary thresholds that must be met prior to the VM becoming operative. In addition to the super-majority affirmative vote of the NAIC, there must be same or similar legislation enacted by states representing 75 percent of the direct premium written in 2008 and same or similar legislation enacted by 42 of 55 jurisdictions. If all these thresholds are met by July 1, the VM becomes operative on the following January 1.

IMPACT STUDY PHASE III TESTING

Subsequent to the NAIC's VM-20 Impact Study, which was performed during 2010–11, the LATF acted on certain recommendations that came about because of the study. In July 2012, the American Council of Life Insurers (ACLI) set out to determine the impact of these recent changes to VM-20 by requesting that member companies use the Impact Study models and provide some of the same calculations from Phase I and Phase II, updating these where applicable for the changes implemented since then. For purposes of this article, the analysis is referred to as Phase III.

The data requested for the Phase III evaluation was a much-scaled down subset of the original NAIC Impact Study. Because the changes to VM-20 since Phases I and II primarily impact term insurance and universal life insurance with secondary guarantee (ULSG), the ACLI data request targeted those companies modeling these lines of business in the earlier phases. A brief review of the significant changes to VM-20 are listed below.

- **Net premium reserve (NPR) method for ULSG policies**
  The NPR calculation for ULSG policies, per VM-20 Section 3.B.6, is shown below. The NPR during the secondary guarantee period is the greater of this amount and the Section 3.B.5 NPR. The Section 3.B.5 NPR is the NPR for policies without secondary guarantees.

$$NPR\ Section\ 3.B.6 = Min\left[\frac{ASG_{x+t}}{FFSG_{x+t}}, 1\right] \cdot NSP_{x+t} - E_{x+t}$$

- **Asset Modeling**
  The LATF adopted reinvestment alternative 2[1] but with a more conservative cap on the assumed aggregate reinvestment rate used in the model. VM-20 Section 7.E.1.g specifies the minimum reserve must not be less than the minimum reserve that would be obtained by substituting an alternative investment strategy in which all fixed income reinvestment assets are public noncallable corporate bonds with gross asset spreads, asset default costs, and investment expenses by projection year that are consistent with a credit quality blend of 50 percent PBR credit rating 6 (A2/A) and 50 percent PBR credit rating 3 (Aa2/AA). This change represents a more conservative requirement since the original cap was expressed as a 50 percent PBR credit rating 6 (A2/A) and 50 percent PBR credit rating 9 (Baa2/BBB) corporate bonds.

- **Mortality Assumption for Modeled Reserves**
  The mortality assumption for deterministic reserve (DR) and stochastic reserve (SR) calculations was modified to allow more recognition of company experience. A company can use its experience data for a number of years, where the number of years is dependent upon the sufficient data period. Grading in to the industry table (2008 VBT) is dependent upon the credibility of the experience data within the sufficient data period. The lower the credibility, the earlier the company must begin grading into the industry table. Refer to VM-20 Section 9.C for detail on mortality requirements.

The companies were asked to use the same model used in Phases I and II of the Impact Study in completing the data request for Phase III. This meant using the same asset and liability population files, the same scenarios

and the same assumption set. In this way, the revised results could be calibrated back to the Phase I and II results, allowing for the differences to be readily quantified as percentage changes in reserve.

The companies produced most, if not all, of the following data.
- Reserve amounts including NPR, DR and SR, for the one-year and five-year blocks of business, with and without reinsurance as applicable.
- Modeled reserves (DR and SR) over a series of mortality sensitivities including company experience mortality with improvement, company experience mortality without improvement, the VM-20 exposure draft requirement and the June 19 exposure version of the mortality requirement.[2]
- Modeled reserves ignoring explicit margins.
- Projected reserves beyond the five-year issue block to a 10-year and 15-year issue block; alternatively, a one-year issue block projected out to future years.
- Modeled reserves using an alternate set of scenarios; these scenarios reflect the June 30, 2012, U.S. Treasury rates and an updated mean reversion parameter in the economic scenario generator.

The interest rate environment has changed considerably since the Dec. 31, 2009, valuation date used in the Impact Study. For the last sensitivity listed above, the data request included a revised set of 1,000 scenarios that had been generated using the June 30, 2012, U.S. Constant Maturity Treasury curve and an updated mean reversion parameter. Both sets of data are shown in Table 1 for reference. Although the underlying scenarios were updated, consistent asset spread and default data was not available, and, as a result, the default and asset spread data used by the contributing companies were not necessarily consistent with the economic scenarios tested.

SUMMARY OF PHASE III OUTCOMES

As was expected, the modeled reserves (deterministic and stochastic) have decreased when comparing Phase III outcomes to Phase I. Anecdotal feedback from some participants indicate they believe this is largely driven by the changes in mortality requirements. As expected, term insurance blocks demonstrate a higher percentage decrease than do ULSG products. The range of percent-

Table 1

U.S. CMT	NAIC Impact Study Phases I and II December 2009	Phase III June 2012
3 Month	0.06%	0.09%
6 Month	0.20%	0.16%
1 Year	0.47%	0.21%
2 Years	1.14%	0.33%
3 Years	1.70%	0.41%
5 Years	2.69%	0.72%
7 Years	3.39%	1.11%
10 Years	3.85%	1.67%
20 Years	4.58%	2.38%
30 Years	4.63%	2.76%
Mean Reversion Parameter	5.25%	4.75%

age change in modeled reserves from Phase I to Phase III (using the LATF adoption version of mortality) on a direct basis for ULSG is -3 percent to -15 percent with one outlier at -30 percent. Similarly, for term insurance, the range is -25 percent to -80 percent. These amounts of change are not inconsistent with the amount of change seen in the Phase II mortality sensitivities.

A recommendation emerging from Phase I testing was to modify the NPR calculation for ULSG policies such that it represented a better statutory floor reserve. For the five ULSG companies producing data testing that recommendation, the NPR has decreased to varying degrees. The range of percentage change for NPR is -4 percent to -33 percent.

Because of the changes in the individual reserve components, the VM-20 minimum reserve is also shown to have changed from Phase I. The minimum reserve has decreased, but the component driving the minimum reserve (i.e., NPR, DR or SR) remains the same for most companies. Percentage changes in minimum direct basis reserve for ULSG blocks ranges from 0 percent to -13 percent and 0 percent to -25 percent for term insurance blocks.

How the VM-20 mortality requirements impact any given block or company depends upon the company's

Table 2

	Change in Direct Deterministic Reserve Mortality Attribution Sensitivity 5-Year Issue Block		
ULSG	Average	Min	Max
Remove qx Improvement	20%	9%	31%
VM-20 Mortality	31%	5%	96%
Total	42%	7%	127%
TERM INSURANCE			
Remove qx Improvement	87%	27%	230%
VM-20 Mortality	78%	11%	201%
Total	147%	38%	305%

credibility and sufficient data period. Table 2 (above) summarizes the outcome of the mortality attribution sensitivity. This is a multilevel sensitivity. The attribution starts with the DR using the company's best estimate mortality assumption. Progressive steps add layers of conservatism that can be quantified by comparing back to the reserve based on best estimate assumptions.

Table 3

	Change in Direct Deterministic Reserve Updating Scenarios to June 30, 2012, Sensitivity 5-Year Issue Block		
	Average	Min	Max
ULSG	26%	5%	67%

Table 4
20 Year US Treasury Rate from ESG
Scenario 12: Deterministic Scenario
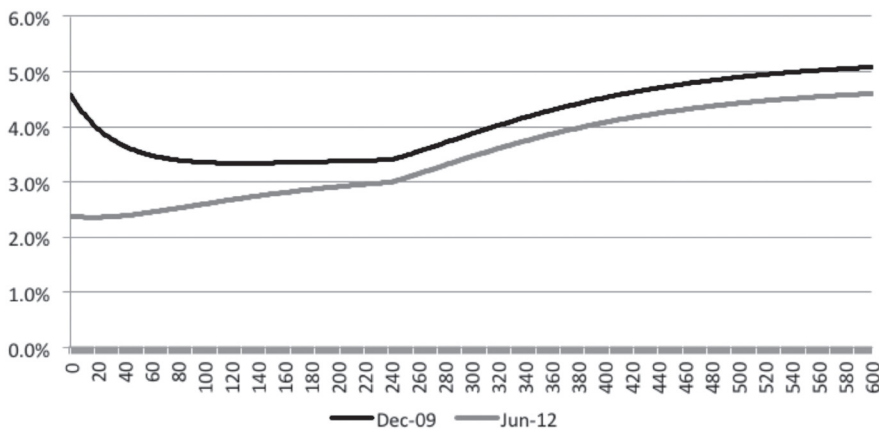
Updating the scenarios to June 30, 2012, economic conditions produces material increases to modeled reserves when compared to baseline. Table 3 (left, middle) measures the percentage change in direct basis deterministic reserve from Phase I to Phase III over this sensitivity. The data set for term insurance included only two companies and is omitted.

The deterministic reserve is dependent upon one scenario, scenario 12 from the set of stochastic exclusion test scenarios. In the economic scenario generator (ESG), scenario 12 applies uniform downward shocks each month for 20 years, sufficient to get down to the 80 percent point on the distribution of 20-year shocks. After 20 years, shocks are at a level that keeps the cumulative shock at the 80 percent level.[3] Table 4 (left, bottom) depicts the 20-year constant maturity treasury rate from scenario 12 at December 2009 and at June 2012. This comparison of the deterministic scenarios provides context for the percentage change figures in Table 3.

In general, outcomes of the Phase III testing support the suggestion that the modifications made to VM-20 as a result of the NAIC Impact Study made progress in addressing the excessive conservatism demonstrated in the Phase I and Phase II testing. The LATF will continue to work on specific areas of VM-20 through 2012 and while the PBR package goes through the state legislative process.[4] ■

END NOTES

[1] Alternative 2 is the method of determining the reinvestment asset return suggested by the American Academy of Actuaries and uses investment spreads over treasuries that grade from current spreads to historical averages. Alternative 1 was a more simplistic approach wherein reinvestment spreads were determined using a formulaic approach.

[2] The June 19 version of mortality was the version briefly adopted in an exposure draft and suggested by LATF's member from Alabama.

[3] VM-20, Appendix 1

[4] Details of the outcomes of the Phase III testing for each participating company can be found in a report on the ACLI website.