

Principle-based Reserves Update

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Agenda for Session

- VM-20 Overview
- VM-20 Timeline
- Major Issues to be addressed
 - Aggregate Assumption Margin
 - Prescribed Reinvestment Spreads
 - Net Premium Reserve
 - Mortality Assumption
- PBR Review and Updating Process



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VM-20 Overview

- Three components:
 - Stochastic Reserve (SR) - calculated in the aggregate
 - Deterministic Reserve (DR) - calculated in the aggregate
 - Net Premium Reserve (NPR) - calculated seriatim and summed
- The Minimum Reserve equals the greater of the three, compared in the aggregate, with an adjustment for any deferred premium asset
 - The adjustment for the deferred premium asset grosses up the SR or the DR if the SR or DR is greater than the NPR.
- The company may elect to exclude one or more groups of policies from the SR and/or the DR requirements if exclusion tests are passed.



VM-20 Adoption Timeline

- Revisions to the NAIC Standard Valuation Law (SVL) were completed in 2009
- Adoption of the Valuation Manual
 - NAIC target is to adopt Valuation Manual at August NAIC meeting
 - SVL and VM package will be sent to states after adoption
- Earliest effective date of the Valuation Manual appears to be 1/1/2015
- But that still requires two “extraordinary” events to occur
 - NAIC will have to adopt the VM and forward the SVL/VM to the states in 2012
 - 42+ state legislatures will have to adopt in 2013 and 2014



VM-20 Timeline

- Commissioner Kitzman (TX) and Commissioner McPeak (TN – “A” Committee Chair) led off Spring LATF meeting with support for a target of June for LATF adoption of the VM.
 - Clear message is VM does not have to be perfect.
 - It is understood additional work will continue on the VM after a June adoption.
- Intent is for the Standard Valuation Law, changes to the Standard Nonforfeiture Law for life insurance, and an NAIC adopted VM to be presented as a package for 2013 state legislative consideration.



VM-20 Timeline

- LATF exposed the entire VM for comments at March LATF meeting
- LATF will address remaining major issues for a targeted June LATF VM adoption.
- LATF intent is to provide a complete enough VM to enable states to consider SVL adoption during their 2013 legislative sessions.
- Work will continue on the VM after a targeted June LATF VM adoption.



Four Major Issues To Address Prior to Target June LATF Adoption

- Four major issues were targeted to address at the Fall 2011 NAIC Meeting.
- Two of these four major issues have been addressed since the fall meeting. These two issues were:
 1. Margins on individual assumptions vs. an aggregate margin
 2. Return assumption on reinvested assets
- Two remaining major issues are:
 1. Net Premium Reserve Method
 2. Mortality assumption



Aggregate Margin

- VM-20 currently requires a margin on each individual assumption.
- Proposal to determine an aggregate margin using a cost of capital approach was submitted by the Academy several years ago, but rejected by LATF.
- Due to concerns on the impact of individual margins on the reserve from the NAIC Impact Study, a proposal to permit the use of an aggregate margin was submitted to LATF in early 2012.
- Due to timing issues, LATF deferred the decision on the use of an aggregate margin until after the June adoption of the Valuation Manual.



Reinvestment Spread Methodology

- Approach proposed by the Academy (for public non-callable bonds):
 - Gross spreads are determined based on actual current and historical market data, using the same tables used in the calculation of default costs.
 - The prescribed gross spreads start at current average market spreads in effect at the valuation date and grade to a long-term benchmark spread over 4 years.
 - Prescribed default costs are then deducted explicitly for purchased assets, using the same approach to calculate default costs as for existing assets (but ignoring step 3: maximum net spread adjustment factor) to determine the net reinvestment spread.
 - For investments other than public, non-callable corporate bonds, gross spreads are not prescribed, but are to be consistent with and in reasonable relationship to the prescribed spreads for public, non-callable corporate bonds.
- Approach proposed by NY:
 - The net yield on reinvestment assets equals the then-current U.S. Treasury interest rate curve times 104% plus 25 basis points.
 - Since the net spread is prescribed, no assumption is needed for default costs.



Reinvestment Spread Methodology

- The methodology proposed by the Academy incorporates a minimum floor.
 - The company's model investment strategy together with the prescribed and non-prescribed spreads must not produce a lower minimum reserve than would result using an alternative investment strategy made up solely of a 50/50 blend of "A2/A" and public, non-callable corporate bonds along with their associated prescribed spreads.
 - The proposed blend of 50% A and 50% BBB is intended to represent an approximate equivalent of the industry average asset allocation. This is based in part on data incorporated in a NAIC Rating Agency Work Group report.
- LATF decision:
 - Adopted Academy proposal, but modified the minimum floor.
 - Alternative investment strategy blend was changed to 50/50 blend of "A2/A" and "Aa2/AA" (not "Baa2/BBB") public, non-callable corporate bonds along with their associated prescribed spreads.



Net Premium Reserve (NPR) Method

- ACLI reported more work is needed for the NPR methodology for universal life insurance products with secondary guarantees (ULSG). Based on the PBR study and input from member companies the ULSG NPR was difficult to apply in some cases and results were not as expected.
- Given the short period of time prior to a targeted June LATF adoption, ACLI will have up to weekly status calls to help LATF be up to speed when the final ULSG NPR is submitted.



Mortality Development in VM-20

- Feedback from NAIC Impact Study was that mortality assumption was complex and difficult to implement.
- The Academy submitted a proposal to address concerns that the VM-20 mortality development was too confusing, complicated, and conservative.
- LATF exposed this proposal for comment at March meeting.
- Academy was asked to provide input on:
 - The “X” factor which relates to the number of claims for a single duration to be considered to have sufficient data.
 - Margin table
 - Examples to test extremes



Procedure to determine Prudent Estimate Mortality Assumption

- Used in deterministic and stochastic reserves
- Net Premium reserve uses separate CSO tables
- Procedure
 1. Determine mortality segments
 2. For each mortality segment, determine:
 - a. Company experience mortality rates
 - Can default to industry table if experience is limited
 - b. Applicable industry mortality table
 - c. Anticipated experience assumptions
 - Sufficient data period
 - Credibility of experience data
 - d. Margin



Mortality Segments

- Level at which separate prudent estimate mortality assumptions determined
- Group of policies expected to have similar mortality experience
- VM-20 currently provides flexibility in how to set the mortality segments
 - Likely to have a mortality segment for each mortality class but can be otherwise
 - E.g., male vs. female, smoker vs. non-smoker, preferred vs. super-preferred vs. residual, etc.



Mortality Segments

Examples of mortality segments

Example 1

- Mortality segment 1 = Male, Non-smoker, Preferred Classes
- Mortality segment 2 = Male, Non-smoker, Residual Standard Class
- Mortality segment 3 = Female, Non-smoker, Preferred Classes
- Mortality segment 4 = Female, Non-smoker, Residual Standard Class
- Mortality segment 5 = Male, Smoker
- Mortality segment 6 = Female Smoker

Example 2

- Mortality segment 1 = Male, Non-smokers
- Mortality segment 2 = Female, Non-smokers
- Mortality segment 3 = Male, Smoker
- Mortality segment 4 = Female, Smoker

Example 3

- Mortality segment 1 = Male, Non-smoker, Super Preferred Class
- Mortality segment 2 = Male, Non-smoker, Preferred Class
- Mortality segment 3 = Male, Non-smoker, Residual Standard Class
- Mortality segment 4 = Female, Non-smoker, Super Preferred Class
- Mortality segment 5 = Female, Non-smoker, Preferred Classes
- Mortality segment 6 = Female, Non-smoker, Residual Standard Class
- Mortality segment 7 = Male, Preferred smoker
- Mortality segment 8 = Male, Standard smoker
- Mortality segment 9 = Female, Preferred smoker
- Mortality segment 10 = Female, Standard smoker



Company Experience Mortality Rates

- Only determined if do not elect to use industry mortality table
 - Essentially the “best estimate” mortality assumptions
- Sources for experience
 - Actual company experience for book of business within the mortality segment
 - Experience from other books of business within the company with similar underwriting
 - Experience data from other sources, if available and appropriate
 - If the source has underwriting and expected mortality experience characteristics that are similar to policies in the mortality segment
- Company can base the mortality rates on more aggregate experience and use other techniques to further sub-divide the aggregate class into various sub-classes or mortality segment
- Requirements regarding frequency of experience studies, justification for assumptions and documentation



Applicable Industry Mortality Table

- Determine appropriate industry table to blend with own experience
 - Using SOA Underwriting Criteria Scoring Tool or other methods, if more appropriate
- Currently, table is specified as 2008 VBT Tables, all forms
 - New tables being worked on
- A modified industry basic table is permitted in a limited number of situations where an industry basic table does not appropriately reflect the expected mortality experience
 - joint life mortality
 - simplified underwriting
 - substandard or rated lives



Anticipated Experience Assumptions

- Determine period for which sufficient data exists (based on policy duration)
- Determine aggregate credibility over sufficient data period
- Grade own company experience mortality rates to applicable industry table following method specified
- Make any adjustments for reasonableness of relationships between classes



Anticipated Experience Assumptions, cont'd

- **Determining sufficient data period**
 - Last policy duration at which sufficient company experience data exists
 - Period ends at the last policy duration which has a minimum of [X] claims per year of exposure period.
 - e.g., if the exposure period is 5 years, the last policy duration at which total # claims is greater than or equal to 5 times X.
 - X is currently under discussion. Academy has proposed a value of 20.
 - May be determined at a more aggregate level than the mortality segment if the company based its mortality on aggregate experience and then used a methodology to sub-divide the aggregate class into various sub-classes or mortality segments.
- **Determining credibility of experience data over sufficient data period**
 - No method specified other than must follow common actuarial practice as published in actuarial literature.
 - Much flexibility in how to determine.



X is used to determine grading period from company experience into applicable industry table

- Grade company experience rates into applicable industry table using following proposed schedule:

(1)	(2)	(3)	(4)
Credibility of company data over sufficient data period	Maximum # of years for data to be considered sufficient	Maximum # of years in which to begin grading after sufficient data no longer exists	Maximum # of years in which the assumption must grade to 100% of an applicable industry table (from the duration where sufficient data no longer exists)
0-19%	10	2	10
20-39%	20	4	15
40-59%	30	6	18
60-79%	40	8	20
80-100%	50	10	25

- Must grade into 100% of the applicable industry table mortality by the later of attained age [95] or 15 years after policy underwriting



Mortality Example

- 10 Mortality segments, 6 NS, 4 SM
 - M/F Super Preferred NS, Preferred NS, Residual NS, Preferred SM, Standard SM
- Company experience mortality viewed as NS/SM, M/F Preferred and better, Standard NS, SM with conservation of total deaths used to split out into sub-classes
- Assume experience study has 5 years of exposure
- Assume $X = 20$ claims per exposure year



Mortality Example

Overall mortality experience, all genders, Nonsmoker risks with credibility determined using Limited Fluctuation at 95% with 3% margin of error

Company ABC Mortality Study													
Experience period: January 1, 2005 to December 31, 2009 Combined													
Traditional Life by Duration													
Gender: All													
Tobacco Status: Nonsmoker													
Underwriting Classes: All, excluding substandard													
Expected Basis: 2008 VBT RR80 ANB													
Duration (All Ages Combined)	Exposure		Actual Claims		Expected Claims		Actual to Expected Ratio		Mortality Rate per 1000	Confidence Interval		Count needed to be fully credible	Percent Credibility
	Count	Amount	Count	Amount	Count	Amount	Count	Amount		Min	Max		
1	780,000	224,064,000	210	96,852	241	69,170	0.872	1.400	0.31	0.27	0.35	15,852,088	22%
2	721,500	162,840,000	270	65,040	286	64,606	0.943	1.007	0.40	0.35	0.44	11,404,098	25%
3	910,000	222,000,000	288	75,348	287	70,001	1.004	1.076	0.32	0.28	0.35	13,484,955	26%
4	650,000	126,000,000	240	51,600	265	51,333	0.906	1.005	0.41	0.36	0.46	11,558,236	24%
5	455,000	114,000,000	211	46,860	221	55,344	0.953	0.847	0.49	0.42	0.55	9,219,814	22%
6	357,500	54,000,000	198	28,140	174	26,344	1.135	1.068	0.49	0.42	0.56	7,704,780	22%
7	253,500	36,000,000	126	21,330	125	17,698	1.011	1.205	0.49	0.41	0.58	8,585,570	17%
8	114,400	18,000,000	84	21,780	77	12,153	1.088	1.792	0.68	0.52	0.83	5,811,081	14%
9	37,700	9,600,000	12	3,600	28	7,199	0.424	0.500	0.75	0.47	1.03	13,407,896	5%
10	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	4,279,600	966,504,000	1,639	410,550	1,698	383,412	0.965	1.071	0.40	0.38	0.42	11,145,940	62%

Overall credibility for Nonsmoker Risks = 62%



Mortality Example

Mortality experience, Male Preferred and Better Nonsmoker risks

Company ABC Mortality Study								
Experience period: January 1, 2005 to December 31, 2009 Combined								
Traditional Life by Duration								
Gender: Male								
Tobacco Status: Nontobacco								
Underwriting Classes: Preferred and Super Preferred								
Expected Basis: 2008 VBT RR80 ANB								
Duration (All Ages Combined)	Exposure		Actual Claims		Expected Claims		Actual to Expected Ratio	
	Count	Amount	Count	Amount	Count	Amount	Count	Amount
1	400,529	111,219,768	82	21,215	87	24,034	0.946	0.883
2	431,808	78,142,845	104	22,140	120	21,702	0.867	1.020
3	418,887	112,634,297	103	25,092	92	24,861	1.114	1.009
4	361,296	67,740,750	107	16,957	103	19,319	1.035	0.878
5	252,048	53,451,750	92	16,335	86	18,164	1.078	0.899
6	168,320	22,512,600	47	8,395	62	8,237	0.760	1.019
7	140,376	19,849,500	69	10,020	62	8,782	1.105	1.141
8	63,528	9,627,750	20	10,506	34	5,200	0.591	2.020
9	21,072	5,544,000	8	2,160	21	5,405	0.380	0.400
10	-	-	-	-	-	-	-	-
Total	2,257,864	480,723,260	631	132,821	666	135,704	94.8%	97.9%

- If $X = 20$, # claims for sufficient data period must be ≥ 100 , then
- Sufficient data period = last duration at which # claims is 100 or higher = duration 4



Mortality Example

- Using table in Section 9C.4.b.iv

(1)	(2)	(3)	(4)
Credibility of company data over sufficient data period	Maximum # of years for data to be considered sufficient	Maximum # of years in which to begin grading after sufficient data no longer exists	Maximum # of years in which the assumption must grade to 100% of an applicable industry table (from the duration where sufficient data no longer exists)
0-19%	10	2	10
20-39%	20	4	15
40-59%	30	6	18
60-79%	40	8	20
80-100%	50	10	25

- Using table and sufficient data period of 4 years (i.e., sufficient data no longer exists at duration 5), must begin grading from own experience to industry experience in duration 12 (4 + 8) and be at 100% industry experience in duration 24 (4 + 20)



Mortality Example

Setting anticipated experience assumption, Male Preferred and Male Super Preferred Nonsmoker risks

Years	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25+		
(1) % own exp	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	92%	85%	77%	69%	62%	54%	46%	38%	31%	23%	15%	8%	0%	0%		
(2) % industry table	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	8%	15%	23%	31%	38%	46%	54%	62%	69%	77%	85%	92%	100%	100%		
Experience Mortality Assumption																											
% 2008 VBT RR80	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25+		
Assumption as % 08VBT	90%	92%	98%	94%	94%	94%	94%	94%	94%	94%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	98%	98%	98%	98%	98%		
Using Conservation of total deaths																											
Super Preferred NS (35%)																											
% 2008 VBT RR80	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25+		
(3) % own exp	82%	84%	90%	86%	86%	86%	86%	86%	86%	86%	87%	87%	87%	87%	87%	87%	87%	87%	87%	90%	90%	90%	90%	90%	90%		
(4) % industry table	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%		
Preferred NS (65%)																											
% 2008 VBT RR80	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25+		
(5) % own exp	94%	96%	102%	98%	98%	98%	98%	98%	98%	98%	99%	99%	99%	99%	99%	99%	99%	99%	99%	102%	102%	102%	102%	102%	102%		
(6) % industry table	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%		
Anticipated Experience Assumption																											
Male, SPNS	82%	84%	90%	86%	86%	86%	86%	86%	86%	86%	87%	87%	87%	87%	87%	87%	87%	87%	87%	90%	90%	90%	90%	90%	90%		
Male, PMS	94%	96%	102%	98%	98%	98%	98%	98%	98%	98%	99%	99%	99%	99%	99%	99%	99%	99%	99%	102%	102%	102%	102%	102%	102%		
Weighted	90%	92%	98%	94%	94%	94%	94%	94%	94%	94%	95%	95%	95%	95%	95%	95%	95%	95%	97%	97%	97%	98%	98%	98%	98%		
Check > Aggregate	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass		



Determining the Margin

- A single margin in the form of a %
- Margin % varies by issue age
- Margin % still to be determined
- Margin should be increased to reflect situations involving greater uncertainty



Determining the Margin – Current Factors

Percentage margin table for company variation risk

Issue Age	Load	Issue Age	Load
<45	21%	58-59	14%
46-47	20%	60-61	13%
48-49	19%	62-63	12%
50-51	18%	64-68	11%
52-53	17%	69-76	10%
54-55	16%	77+	9%
56-57	15%		



Margin Consideration For Gross Premium Reserve

- Margin considerations for gross premium reserve are different than for net premium reserve
 - Under Net Premium method, a flat % margin increases both the benefits and the net premiums
 - However, under Gross Premium method, only the benefits are increased as the Gross Premium is not affected
- A margin more consistent with the approach used in Canada is preferable
- Unlike current Net Premium reserve method, the mortality assumptions must be re-evaluated each year so should not need to be as high
- Current margin took this into account in determining the % loads; however, was meant to be used in combination with another margin for companies that used their own experience
 - Current table is too conservative for companies that use their own experience



Margin Consideration For Gross Premium Reserve, cont'd

- The margins are specific to the underlying VBT table and experience of the contributors relative to the mean (i.e., the variation around the mean)
- Margins/loads will need to be re-evaluated once 2014 VBT is complete
- In interim, suggest just modifying the current table to be based on attained age rather than issue age



Determining the Margin - Proposed

Percentage margin table for company variation risk

Attained Age	Load	Attained Age	Load
<45	21%	58-59	14%
46-47	20%	60-61	13%
48-49	19%	62-63	12%
50-51	18%	64-68	11%
52-53	17%	69-76	10%
54-55	16%	77+	9%
56-57	15%		



PBR Review and Updating Process

- A well-conceived and designed PBR Review and Updating Process (formerly referred to as a "PBR Feedback Loop") is essential to ensure that there is an ongoing evaluation of the effectiveness of the PBR methodology and prescribed assumptions defined in the Valuation Manual.
- Academy developed a proposal that provides a summary of the importance, purpose, and goals of such a process.
- A key element of the PBR Review and Updating Process is providing support to state insurance regulators regarding the necessary expertise, resources, data, and tools to effectively review PBR models and reporting for products subject to PBR requirements.
- LATF adopted the Academy proposal (with some modifications) in section VM-00 of the Manual.



Q&A

