

PBR for Regulatory Actuaries

November 20, 2013

American Academy of Actuaries

Dave Neve, FSA, MAAA, CERA

Cande Olsen, FSA, MAAA



Agenda

- VM-20 Overview

Dave Neve, FSA, MAAA, CERA

Chairperson, Life Financial Soundness/Risk
Management Committee

- PBR Actuarial Standard of Practice Exposure Draft

Cande Olsen, FSA, MAAA

Chairperson, Life Principle-Based Reserves
Strategy Subgroup



VM-20 Overview

Dave Neve, FSA, MAAA, CERA

Chairperson, American Academy of Actuaries

Life Financial Soundness / Risk Management Committee



Current Formula-based Valuation System

- Formula-based valuation began in 1858 with Massachusetts legislation
- Formula specified was Net Level Premium Reserve Method
 - Reserve = Present Value of Future Guaranteed Benefits less Present Value of Future Net Level Premiums
 - Prescribed valuation mortality table: 1843 British Mortality Table
 - Prescribed valuation interest rate: 4.0%
- Very little has changed over the last 155 years
 - Still a formula-based valuation system (CRVM)
 - Prescribed valuation mortality table: 2001 CSO for life reserves
 - Prescribed valuation interest rate: 4.0% (2013 issues for life insurance)
 - No actuarial judgment allowed in formula calculation
 - 1990's Asset Adequacy Analysis added to test adequacy of formula-based reserve



Why Change Reserves?

- The nature of insurance products continues to change, from relatively simple to more complex



- “Right-sizing reserves” - The new approaches more fully reflect the risks in:
 - secondary guarantees and policyholder options
 - the probability of exercising those guarantees and options
 - the availability of cash flows from company investments to support those values



Benefits of a Principle-based Valuation System

- Addresses all of the identifiable, quantifiable and material risks, benefits and guarantees within an insurance contract
- “Right Sizes” reserves based on risk profile of the insurance company and product features and guarantees
- Consumers are not over charged because of redundant reserves or under charged because of insufficient reserves
- Reserves reflect actual product and company risks and risk management processes
- Eliminates constant regulatory or legislative action to make adjustments to formulas or rules
- Retains the ability to establish a minimum floor if needed



Comparison of Valuation Systems

Formula-based

- Formula for broad categories of products may not address all risks or contract benefits
- Same assumptions and margins for all companies
- Calculated using formula for each policy
- Assumptions locked in at issue date
- Uses industry average assumptions

Principle-based

- Model-based calculations for groups of policies
- Reflects all risks in products
- Reflects company experience in assumptions
- Reflects current economic conditions, and possible changes to future economic conditions
- Reflects risk management business practices
- Assumptions can be unlocked to reflect changes in experience



PBR Observations

- Relies more on professional actuarial judgment
- Requires a stronger governance process to be in place for companies, auditors and regulators
- Increases the need for communication from management to regulators
- Requires greater discipline around the valuation and financial reporting process
- Consistent with a company's ERM and ORSA processes
- Consistent with regulatory risk focused examinations



Principle-based Valuation System Challenges

- Developing modeling expertise within the regulatory community
- Collecting and analyzing a vast array of company experience data
- Development of industry-wide benchmarks for experience data
- Implementing enhanced controls and governance around the actuarial function
- Explaining changes in reserves/volatility
- Verifying/Validating model reserves for complex and risky products



PBR Valuation System Framework

- Amendments to the Standard Valuation Law (NAIC Model 820)
- Amendments to the Standard Non-forfeiture Law (NAIC Model 808)
- Valuation Manual (VM)
 - Contains details of valuation minimum standards for all lines of business
 - Contains details on collection of company experience data and data formats
 - Contains details on actuarial opinion and memorandum requirements
 - Contains details on actuarial reporting and documentation requirements under PBR
 - Contains corporate governance requirements under PBR
- Amendments to Model 820 and Model 808 have to be adopted by state legislatures



PBR Valuation System Framework

- Valuation Manual becomes operative on January 1 of the first calendar year following the first July 1 as of which all of the following have occurred:
 - 1) Valuation Manual is adopted by the NAIC with an affirmative vote of at least 42 of the 55 U.S. jurisdictions (50 states, American Samoa, American Virgin Islands, District of Columbia, Guam and Puerto Rico) or 75% of members voting whichever is greater. Valuation Manual adopted by NAIC December 2012
 - 2) Legislative enactment of SVL amendments by at least 42 of the 55 U.S. jurisdictions (50 states, American Samoa, American Virgin Islands, District of Columbia, Guam and Puerto Rico)
 - 3) Legislative enactment of SVL by states representing greater than 75% of direct premiums written as reported in annual statements submitted for 2008.
- 7 states adopted the amendments to both laws (SVL and SNFL) in 2013
 - Arizona, Indiana, Louisiana, Maine, New Hampshire, Rhode Island, Tennessee



PBR for Life Insurance Products (VM-20)

- PBR for Life products only applies to new policies issued after the new PBR requirements go into effect.
- All Life products will be subject to new PBR requirements except credit life and pre-need.
- SVL allows commissioner to make an exemption from PBR for specific product forms or product lines if a domestic company is licensed and doing business only in a single state
- Companies have the option to phase in the new PBR requirements over three years once PBR becomes operational.
- Regulators will be building more tools and will be implementing data collection requirements to enhance regulatory oversight.



Minimum Reserve under VM-20

- Three components:
 - **Net Premium Reserve (NPR)** - calculated seriatim and summed.
 - **Deterministic Reserve (DR)** - calculated in the aggregate.
 - **Stochastic Reserve (SR)** - calculated in the aggregate.
- The Minimum Reserve equals the greatest 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 Deterministic Reserve and Stochastic Reserve require the use of a cash flow model.
- The company may elect to exclude one or more groups of policies from the SR and/or the DR requirements if prescribed exclusion tests are passed.



Net Premium Reserve

- Serves as a minimum floor
- Uses only prescribed assumptions (not company experience assumptions)
- Uses a reserve methodology that is designed to comply with the tax code
- Policy-by-policy reserve calculation
 - Prescribed assumptions, mortality tables, and interest rates
 - Similar to current CRVM and more consistency with tax code
 - Policy floors of cash surrender value and cost of insurance
- Similar to current CRVM approaches, but allows modification for products such as term life
 - Expense allowances are expanded from the current CRVM
 - Lapse is considered for products without cash surrender values

VM-20 Reserve components:

- **Net Premium Reserve**
- Deterministic Reserve
- Stochastic Reserve



Net Premium Reserve

- VM20 defines NPR to be:
 - Current CRVM for products other than Term insurance or Universal Life with Secondary Guarantees (ULSG)
 - New NPR method for Term insurance or ULSG
- Future changes are needed to accommodate other individual life products
- Defines reserve computations separately for fund based and non-fund-based life products to clearly delineate product designs and to address various UL designs. While the methods are defined separately, they are intended to provide a consistent basis.
- Differences from current CRVM
 - Updated expense allowance that is better aligned with industry expenses and includes limited renewal allowances.
 - Lapse for certain products
 - Higher interest for products with no CSV

VM-20 Reserve components:

- **Net Premium Reserve**
- **Deterministic Reserve**
- **Stochastic Reserve**



The Deterministic Reserve

- Based on a Gross Premium Valuation methodology (present value of benefits and expenses less the present value of premium and other inflows)
- Uses cash flow model to project revenue, benefits, and expenses
- Is an aggregate reserve, and the company can group policies into modeling cells to project future cash flows
- Cash flows are projected under a single prescribed economic scenario (interest rate movements and equity returns)
- Present Values are calculated using discount rates that equal the path of projected Net Asset Earned Rates (i.e., the company's projected portfolio rate)
- Different Net Asset Earned Rates are determined for each “model segment” that reflect the company's investment strategies for different products
- Net Investment Income is not included in the cash flows; investment earnings are reflected in the reserve via the discount rate
- Is not designed to capture tail risks⁴
- Serves as a floor for the Stochastic Reserve

VM-20 Reserve components:

- Net Premium Reserve
- **Deterministic Reserve**
- Stochastic Reserve



The Stochastic Reserve

- Multiple economic scenarios are used to project revenue and benefits for a group of policies (model segment)
 - Intended to capture “tail risk” – risks that could have high impact, but low probability
- Approach to determine the stochastic reserve component:
 - Rank the amounts calculated for each economic scenario from highest to lowest
 - Take the average of the highest amounts above the 70th percentile of ranked results (i.e., the average of the highest 30%)
 - Also known as Conditional Tail Expectation 70 or “CTE 70”
- Closer to a “true” principle-based reserve, since it more accurately captures the risks related to the contract

VM-20 Reserve components:

- Net Premium Reserve
- Deterministic Reserve
- **Stochastic Reserve**



The Stochastic Reserve

- Similarities to the Deterministic Reserve:
 - Both use cash flow models
 - Both use the same assumptions for non-economic assumption (mortality, policyholder behavior, expenses) with a few exceptions
- Differences from the Deterministic Reserve:
 - Focus is on risks that have high impact but low probability
 - Based on the outcomes under multiple economic scenarios, not just one
 - Uses a GPVAD method (Greatest Present Value of Accumulated Deficiencies), not a Gross Premium Reserve
 - Discount rate is prescribed, not the company's projected portfolio rates
 - Will typically include dynamic policyholder behavior assumptions that reflect the behavior expected from the environment depicted in the scenario

VM-20 Reserve components:

- Net Premium Reserve
- Deterministic Reserve
- **Stochastic Reserve**



Direct, Ceded & Net Calculations

- The minimum reserve defined in Section 2 of VM-20 is a “post-reinsurance-ceded” (Net) reserve
- The “pre-reinsurance-ceded” (Gross) reserve is calculated under same requirements of VM-20, but EXCLUDING the effect of reinsurance
- The reported reinsurance credit is therefore the gross reserve less the net reserve



What are Cash Flow Models?

- System of population data, assumptions and software to produce future cash flow streams
- Produce projected cash flows based on specific benefits and options available in a company's liabilities and assets
- Companies typically will utilize modeling software from an outside vendor
- VM-20 requirements for cash flow models
 - Can group policies and assets into modeling cells, but must be consistent with insurer practice for segmenting liabilities and assets
 - Assign each policy to one and only one modeling cell
 - Project cash flows to a period far enough into the future that no obligations remain
 - Simplifications and modeling efficiency techniques may be used
 - Cash flow model requirements must be applied consistently to both deterministic and stochastic projections
 - Federal income taxes are ignored
 - All material product features are to be reflected – both guaranteed and non-guaranteed



Major Risks in Life products

- Mortality is higher than expected
- Earned Interest is lower than expected
- Lapses occur before acquisition expenses are recouped
- Surrenders occur at different times than expected
- Expenses are higher than expected
- Premium patterns are different than expected



Major Risks in Life products

- Will vary by product as to importance
- Examples:
 - Term Life – Mortality, lapse and expenses
 - Whole Life – same as Term, plus:
 - Reinvestment rate
 - Surrenders
 - Universal Life – same as Whole Life plus:
 - Premium patterns;
 - Credited rate strategy
 - Partial withdrawals



VM-20 Assumptions

- Assumptions used in VM-20 will fall into one of three categories
 - Prescribed Assumptions
 - Stochastically Modeled Assumptions
 - Prudent Estimate Assumptions



Prescribed Assumptions

- These are deterministic assumptions used for risks where the company has very little or no influence or control over the outcome
 - For example, asset default costs
- For these types of risks, all companies will be required to use the same assumptions
- Prescribed assumptions are used in all three of the reserve components
 - The Stochastic and Deterministic components use prescribed assumptions for some of the risk factors in those calculations
 - The Net Premium Reserve component uses only prescribed assumptions

Types of Assumptions in VM-20:

- **Prescribed Assumptions**
- Stochastically Modeled Assumptions
- Prudent Estimate Assumptions



Stochastically Modeled Assumptions

- These are used for risks that are more properly modeled through a stochastic process
- These are used only in the stochastic reserve component
- Currently, only interest rate movements and equity returns are required to be modeled stochastically
 - However, VM-20 allows other risk factors to be modeled stochastically within the stochastic reserve component

Types of Assumptions in VM-20:

- Prescribed Assumptions
- **Stochastically Modeled Assumptions**
- Prudent Estimate Assumptions



Prudent Estimate Assumptions

- These are used where the company has some degree of influence on the outcome of the risk factor
 - Equals the actuary's best estimate of the future (anticipated experience) plus a margin for adverse deviation and estimation error
 - Margins reflect the degree of uncertainty in the anticipated experience assumption and provide an element of conservatism
 - Determination of margins can be complicated if there is a lack of credible experience data
 - Determination of margin involves actuarial judgment
 - The resulting valuation assumptions for this category could differ by company, reflecting the different risk profiles of the company.
- Must be documented, reviewed periodically and updated as appropriate
- Prudent estimate assumptions are used in both the Stochastic and Deterministic components of VM-20

Types of Assumptions in VM-20:

- Prescribed Assumptions
- Stochastically Modeled Assumptions
- **Prudent Estimate Assumptions**



Anticipated Experience Assumptions

- **Anticipated experience assumptions** are generally based on the actual experience of the company, or if not known, on industry experience (or a combination of the two)
- Much discussion took place by regulators on how to establish Anticipated Experience assumptions when there is a lack of credible data
- Adopted Academy proposal on guidance regarding appropriate methods to “blend” company experience with industry data, depending on type of risk factor
- Includes use of actuarial judgment on risk factors when there is no company or industry experience

anticipated experience assumption + margin = prudent estimate assumption



General Margin Requirements

- Margins provide for adverse deviations and estimation error
- Will be determined by the actuary using professional judgment, subject to any guidelines established by the NAIC and Actuarial Standards of Practice (ASOPs)
 - One exception: mortality margins include several prescribed elements
- Must establish a margin on each assumption
- The greater the uncertainty in the Anticipated Experience Assumption, the larger the required margin. For example:
 - When experience data is not relevant, credible, quality, etc.
 - Anticipated changes in company circumstances or policies
- Margins move in the direction to produce a larger reserve
 - Larger margins are needed if experience is less relevant, less credible, or of lower quality, or if modeling limits how the risk factor is reflected
 - Margins are not required if variations in the assumptions are immaterial
- LATF is discussing the possible use of an aggregate margin approach



Primary Prudent Estimate Assumptions

- Mortality
- Policyholder Behavior*
 - Premium persistency
 - Surrenders and withdrawals or lapses
 - Premium patterns
 - Benefit utilizations
- Expenses*
- Non-guaranteed elements*

* may be dynamically modeled, so the assumption includes a formula of expected behavior (i.e., will vary by scenario)



VM-20 Mortality Calculation

- Group policies into “mortality segments” that are expected to have similar mortality experience (e.g. preferred classes, smoker and non-smoker classes)
- Determine company experience rates (or use applicable industry table) for each mortality segment. “Company experience” can include other blocks with similar underwriting (from affiliates or reinsurance pools)
- Determine the applicable industry table for each mortality segment to grade company experience to the industry basic table
- Determine the level of credibility of the underlying company experience
 - The credibility may be at either the mortality segment level or at a more aggregate level
 - VM-20 does not prescribe the credibility method, but must satisfy certain conditions
- Apply prescribed mortality margins. Separate mortality margins are determined for company experience mortality rates and the applicable industry basic tables.
- Grade company experience to an industry table using a prescribed grading table based on the level of credibility of the data



Investment Return Assumptions

Existing assets

- **Top down approach**
- Start with gross investment return, and subtract default costs and investment expenses
- Gross investment return is available from each investment (coupon on bonds, loan interest on mortgages, etc.)
- Default assumptions in VM-20 follow a prescribed methodology
- Actual default losses will be very lumpy. VM-20 assumes a smooth annual “default cost” by reducing the gross investment return with a charge for expected defaults.



Investment Return Assumptions

Reinvestment assets

- Future investments purchased in model from projected cash flows each year
- Model reinvestment asset allocations following an assumed “Model Investment Strategy” set by the company
- **Bottom up approach** (don’t have gross investment return like existing assets)
 - Start with prescribed treasury rate, and then add a prescribed gross spread to get gross investment return
 - Gross investment return is also impacted by tenor of modeled investments
 - Then subtract prescribed default costs and investment expenses, similar to existing assets



Examples for Gross Investment Return for Reinvestments

<u>“A” rated corporate bond</u>	<u>3 year</u>	<u>10 year</u>
Current Treasury Rate:	2.0%	4.0%
Prescribed Market spread (bp):	110	140
Gross investment return:	3.1%	5.4%
<u>“BBB” rated corporate bond</u>		
Current Treasury Rate:	2.0%	4.0%
Prescribed Market spread (bp):	180	220
Gross investment return:	3.8%	6.2%



Economic Scenarios Defined by VM-20

- An “Economic Scenario” is a prescribed path of future interest rate and equity return assumptions
- **Deterministic Reserve:** uses a single economic scenario
- **Stochastic Reserve:** uses multiple economic scenarios
 - VM-20 requires that the company use a **prescribed economic scenario generator** (ESG) to generate multiple scenarios
 - The company cannot use its own proprietary generator (as in C3P2 and AG43) by satisfying calibration criteria; it is expected the NAIC will use the Academy Economic Scenario Generator
 - Starts with 10,000 stochastic scenarios
 - Company can utilize **scenario reduction techniques** to reduce the number of scenarios



Evaluating Assumptions

- Exam procedures – Assumption controls and governance
 - Review how the studies were done (what was looked at – e.g., lapse rates by premium pattern)
 - Review inputs
 - Review outputs
 - Review assumptions based on these studies
- Consistency with other companies
- Consistency with prior reviews
- Reasonableness; actual to expected relationships for assumptions



Stochastic Reserve Calculation

- Cash flows are projected under multiple economic scenarios from a prescribed stochastic generator that randomly projects future interest rate movements and equity returns
- The process starts with an estimated value of the final reserve and then adjusts it for the amount of the greatest asset deficiency over the lifetime of the product
- For each scenario, a **Scenario Reserve** is determined = the Greatest Present Value of Accumulated Deficiency (GPVAD), plus the amount of starting assets
 - At the valuation date, estimate the amount of starting assets that is equal to the estimated final reserve amount (a “catch-22” situation)
 - Project the accumulated value of assets (may be positive or negative) at the end of each future projection year
 - Accumulated deficiency = the negative of the accumulated assets
 - Discount the accumulated deficiency at each future year to the valuation date
 - Discount rate = 105% of 1-year Treasury rate
 - Scenario Reserve = the largest of discounted values (GPVAD), plus the starting asset amount
- **Stochastic Reserve** = average of highest 30% of Scenario reserves (70 CTE)



Stochastic Reserve Calculation Hypothetical Example

Starting Assets	1000
No. of Scenarios	10
Projection Period	5 years

Discount Rates

Year:	1	2	3	4	5
Scenario #1	4.0%	4.1%	4.2%	4.3%	4.4%
Scenario #2	4.0%	3.9%	3.8%	3.7%	3.6%
Scenario #3	4.0%	3.9%	3.8%	3.9%	4.0%



Stochastic Reserve Calculation Example

Accumulated Assets

Year:	Start	1	2	3	4	5
Scenario #1	1000	950	900	850	800	750
Scenario #2	1000	950	700	450	200	-50
Scenario #3	1000	1200	700	-50	-100	200

Present Value of Accumulated Assets

Year:	Start	1	2	3	4	5
Scenario #1	1000	896	800	712	630	555
Scenario #2	1000	896	624	379	159	-38
Scenario #3	1000	1132	624	-42	-80	150



Stochastic Reserve Calculation Example

Present Value of Accumulated Deficiency (Negative of Accumulated Assets)

Year:	Start	1	2	3	4	5
Scenario #1	-1000	-896	-800	-712	-630	-555
Scenario #2	-1000	-896	-624	-379	-159	38
Scenario #3	-1000	-1132	-624	42	80	-150

Greatest Present Value of Accumulated Deficiency

Scenario #1	-555
Scenario #2	38
Scenario #3	80



Stochastic Reserve Calculation Example

GPVAD for 10 Scenarios

Ranked in order of size

Scenario #1	-555	Scenario #10	-1234
Scenario #2	38	Scenario #1	-555
Scenario #3	80	Scenario #4	-416
Scenario #4	-416	Scenario #7	-208
Scenario #5	19	Scenario #5	19
Scenario #6	40	Scenario #2	38
Scenario #7	-208	Scenario #6	40
Scenario #8	47	Scenario #8	47
Scenario #9	99	Scenario #3	80
Scenario #10	-1234	Scenario #9	99

CTE(70) 75
 Average of the largest
 30%
 (Average of 47, 80, 99)

Stochastic Reserve = Starting Assets Plus GPVAD at CTE(70) = 1,000+75 = 1,075



Deterministic Reserve Calculation

	1	2	3	4	5	
<u>Projected Cash Flows</u>						
Premiums	4,000	3,796	3,599	3,404	3,306
Death Benefits	100	190	360	651	892
Surrender benefits	1,000	1,186	1,349	1,489	1,520
Expenses	200	190	180	170	160

Reserve Calculation

Present Value of Benefits

Death Benefits 15,031

Surrender Benefits 26,318

Present Value of Expenses 1,118

PV of Benefits and Expenses 42,467 A

Present Value of Premiums 22,354 B

Deterministic Reserve 20,113 A-B



NPR Term Product Example

- Under current CRVM (for a level premium product):
 - Net premiums = α (first year) and β (payable years 2 and later)
 - Difference between α and β is the expense allowance

- Under New NPR
 - Net Premium = N times adjusted gross premium
 - $N = \{PV \text{ Benefits} + 2.50 \text{ per } 1000 \text{ of face}\} \text{ divided by } \{PV \text{ Gross Premiums}\}$
 - After level premium period, net premium is limited, and can result in modification of N

- Under New NPR, Adjusted gross premium =
 - Year 1 = 0% GP
 - Year 2 – 5 = 90% GP
 - Year 6 + = 100% GP



Term Product Example

- After level premium period, net premium is limited, and can result in modification of N
- The limitation is that PVP (after level premium period) cannot be more than 135% of PVB (after level premium period).
- If ratio is over 135%, reduce net premiums post level premium period uniformly to 135%.
- Then increase net premiums during level premium period such that PVB (time 0) = PVP (time 0)



Term – Net Premiums for sample product

	Gross Premium	Adjusted Gross Premium	Uniform Percent	Trial Net Premium	Final Net Premium	Resulting Percent
1	0.61	0.00		0.00		
2 - 5	0.61	0.55	215.62%	1.18		
6 - 20	0.61	0.61	215.62%	1.32		
21	7.10	7.10	215.62%	15.31		
22	8.06	8.06	215.62%	17.38		
23	9.16	9.16	215.62%	19.75		



Term – Net Premiums for sample product

	Gross Premium	Adjusted Gross Premium	Uniform Percent	Trial Net Premium	Final Net Premium	Resulting Percent
1	0.61	0.00		0.00	0.00	N/A
2 - 5	0.61	0.55	215.62%	1.18		
6 - 20	0.61	0.61	215.62%	1.32		
21	7.10	7.10	215.62%	15.31	5.40	76.05%
22	8.06	8.06	215.62%	17.38	6.13	76.05%
23	9.16	9.16	215.62%	19.75	6.97	76.05%



Term – Net Premiums for sample product

	Gross Premium	Adjusted Gross Premium	Uniform Percent	Trial Net Premium	Final Net Premium	Resulting Percent
1	0.61	0.00		0.00	0.00	N/A
2 - 5	0.61	0.55	215.62%	1.18	1.25	227.55%
6 - 20	0.61	0.61	215.62%	1.32	1.39	227.55%
21	7.10	7.10	215.62%	15.31	5.40	76.05%
22	8.06	8.06	215.62%	17.38	6.13	76.05%
23	9.16	9.16	215.62%	19.75	6.97	76.05%



Exclusion Tests

- There are two exclusion tests
 - Stochastic exclusion test (SET)
 - Deterministic exclusion test (DET)
- Exclusion tests are applied to groups of policies
 - A company can have policies that pass different combinations of the exclusion tests (i.e., both, only one, or none)



Purposes of Exclusions

- PBR is based on risk analysis
 - When there is less risk, VM-20 exclusions permit less work for the company
- Smaller companies have fewer resources
 - Usually these companies have less risky products and assets, so less work as above
 - Some smaller companies may be willing to hold somewhat higher reserves as a trade-off for even less work



Stochastic Exclusion Test (SET)

- Exempts product groups with less interest rate and market risk from calculating the Stochastic Reserve
- Products such as term, traditional whole life, and possibly accumulation UL may be able to pass this test
- There are three ways to pass the SET
 - Stochastic Exclusion Ratio Test.
 - Using the cash flow testing model for the product group, run 16 prescribed interest rate/equity rate scenarios
 - Calculate the ratio of the maximum variation in the cash flow testing results from the baseline to the present value of benefits and expenses for the baseline
 - If this ratio is less than 4.5%, then the SET is passed and no Stochastic Reserve is required for that product group
 - Demonstration and Certification. Except for products classified as Universal Life with Secondary Guarantees (ULSG) or variable life, a qualified actuary can certify every three years that the product group does not have significant interest rate risk or asset return volatility by giving a demonstration that calculating the Stochastic Reserve would not increase the final reserve
 - Commissioner Exemption. Requesting approval from the commissioner that the company does not need to calculate the Stochastic Reserve



Deterministic Exclusion Test (DET)

- Exempts product groups with sufficient premiums from calculating the Deterministic Reserve
 - The product groups must be similar in liability characteristics
 - For certain products classified as ULSG, Deterministic Reserve must be calculated
 - If the product group does not pass the SET, then the Deterministic Reserve must be calculated
- Products such as less competitive term and some traditional whole life may be expected to pass this test
- Compare the gross and Net Premium Reserve (NPR) net premiums for the product group in aggregate
 - If the aggregate gross premiums for the product group are greater than the aggregate NPR net premiums for the product group, then the DET is passed and no Deterministic Reserve is required for that product group
- If no new business added to the product group and if passed DET for three straight years, then only need to recheck every 5th year thereafter



Aggregate Margin

- VM-20 currently requires a margin on each individual assumption
- In contrast, an aggregate margin approach starts with an reserve calculation with no margins in each individual assumption, but then adds an aggregate margin at the end
- 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 the NAIC Life Actuarial Task Force (LATF) in early 2012
 - Due to timing issues, LATF deferred the decision on the use of an aggregate margin until after adoption of the Valuation Manual by the NAIC
 - LATF has formed a subgroup, chaired by Mark Birdsall of Kansas to study the issue
 - LATF has asked the Academy to develop a recommendation on the use of an aggregate margin
- The Academy formed a task force, chaired by Patricia Matson, to make a recommendation
 - Proposal to determine an aggregate margin using a cost of capital approach was submitted by the Academy several years ago, but rejected by LATF
 - Goal is to submit recommendation to LATF before the end of 2013



Concerns with Individual Margins

- Per assumption margins are time-consuming to set and in many cases involve a high degree of judgment
- Poses the challenge of how to incorporate correlation between risks. In practice, quantifying such correlation is time consuming, onerous and rarely done or, if done, is performed on a very approximate basis.
- The cumulative individual margins are likely to produce a distorted picture of the cumulative uncertainty associated with the set of modeling assumptions, thereby producing overly conservative reserves
- It is very difficult to determine appropriate margins on certain policyholder behavior assumptions, such as premium pattern assumptions, and allocation between available investment funds
- Establishing assumptions for NGEs is problematic under an individual margin approach since the margin in each individual assumption represents adverse experience that the NGE assumptions are designed to mitigate



Recommendations of Academy Aggregate Margin Task Force

- Several methods were considered, but two methods rose to the top:
 - Cost of Capital Method
 - Confidence Interval Method
- The Academy Task Force tentatively recommended the Cost of Capital Method, pending further analysis of the practical implementation approach for such a method
- While the Academy Task Force considered some of the practical implementation issues in coming to this recommendation, a more in-depth analysis of possible implementation approaches is a critical next step
 - To the extent that that detailed implementation analysis results in significant issues in terms of implementing the Cost of Capital Method, an alternative approach may be required
 - In light of the potential for issues regarding implementation, the Academy Task Force also recommended that further analysis of the potential implementation approach for the Confidence Interval Method also be considered
 - The Academy Task Force said that both the Cost of Capital and the Confidence Interval Methods are robust methods that meet overall objectives



Valuation Manual

PBR Documentation Requirements

- PBR documentation requirements are provided in VM-31, “PBR Report Requirements For Business Subject To A Principle-Based Reserve Valuation”
- Referred to as “PBR Actuarial Report”
- PBR Actuarial Report includes:
 - Individual life insurance products whose reserves are calculated under the VM-20 deterministic or stochastic PBR reserve methods
 - Variable annuity products whose reserves are calculated under VM-21
- Documentation requirements are also found in VM-20 and VM-21 and reflected in the PBR Actuarial Report
- PBR documentation will include additional product lines as PBR is developed for these in the future



PBR Actuarial Standard of Practice Exposure Draft

Cande Olsen, FSA, MAAA

Chairperson, American Academy of Actuaries

Principle-Based Reserves Strategy Subgroup



What is an ASOP?

(from ASOP No. 1, Introductory Actuarial Standard of Practice)

- ASOPs identify what the actuary should consider, document, and disclose when performing an actuarial assignment
- ASOPs:
 - Are principle-based; do not dictate every step in an actuarial assignment
 - Are not narrowly prescriptive; do not dictate an approach or mandate an outcome
 - Provide the actuary with an analytical framework for exercising professional judgment
 - Identify factors that the actuary should consider when rendering an actuarial service

[Proposed Actuarial Standard of Practice - Principle-Based Reserves for Life Products](#)



The PBR ASOP

- The PBR ASOP is expected to:
 - Provide guidance to actuaries that are assisting companies in complying with the requirements of the Valuation Manual (VM)
 - Provide guidance to actuaries where the VM specifically anticipates additional guidance will be provided by the Actuarial Standards Board
 - Provide guidance to actuaries in areas that the VM does not fully address:
 - By emphasizing areas already covered by other ASOPs
 - By providing new guidance



ASOPs Must Serve Regulators as Well as Industry

- More regulator input and comment is needed/welcome
- Detailed comments that offer specific support or suggestions for change are most desirable, but broader/more general comments are also welcome and encouraged
- The LPC plans to make a general comment that it would be helpful to more clearly identify when the text is summarizing VM-20 requirements, and when the text is providing guidance not in VM-20
 - Do regulators agree?



Academy Letter to Joint Qualified Actuary (A/B/C) Subgroup

- [Academy Comment Letter of September 27, 2013](#) states that the ASB:
 - Has been reaching out to regulators for feedback on ASOPs that impact regulatory filings
 - Has tried to balance the need for broad application of ASOPs with the need for prescriptive ASOPs
 - Will adopt more prescriptive ASOPs when needed and appreciates regulatory feedback on those ASOPs, **including the newly exposed PBR ASOP**



Questions to Consider



Questions to Consider

- The text of the ASOP sometimes repeats or summarizes material in VM-20 to the extent needed to clarify the guidance. Is this overdone or, conversely, should there be more of it?



Questions to Consider

- Is the guidance provided clear and appropriate? If not, what specific changes do you suggest? Specific areas to think about include:
 - Grouping policies into modeling cells (Section 3.5.5)
 - Deciding on model granularity (Section 3.5.5)
 - Making adjustments when data prior to the valuation date is used (Section 3.5.6)
 - Doing stochastic analysis of nonproportional reinsurance (Should there be a section in the ASOP?)



Questions to Consider

- Is this standard of practice appropriately prescriptive? Is it too specific? Is it too broad? Why?



Questions to Consider

- If adopted, do you think that this standard of practice provides adequate guidance for actuaries responsible for determining principle-based reserves? If not, what changes would you suggest?



Questions

For more information, please contact:
John Meetz, Academy Life Policy Analyst
meetz@actuary.org
(202) 223-8196

