Session 021 TS - U.S. Statutory Update: Annuities

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2017 SOA Annual Meeting & Exhibit

CINDY BARNARD

Session #21: US Statutory Update – Annuities

October 16, 2017

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Agenda - US Statutory Issues Non-Variable Annuities

- Annuity Statutory Reserve Items
  - Valuation Manual
  - Statutory Interest Rates for Payout Annuities
  - Non-Variable Annuity PBR
  - Statutory Interest Rate Modernization for Deferred Annuities

- Risk-Based Capital
  - C2 Longevity Risk
  - C1 Bond Factors
  - C1 Real Estate
  - C4 Operational Risk

Annuity Statutory Reserve Items

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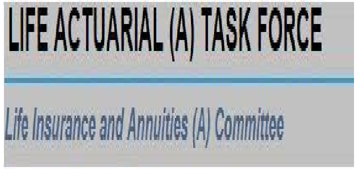
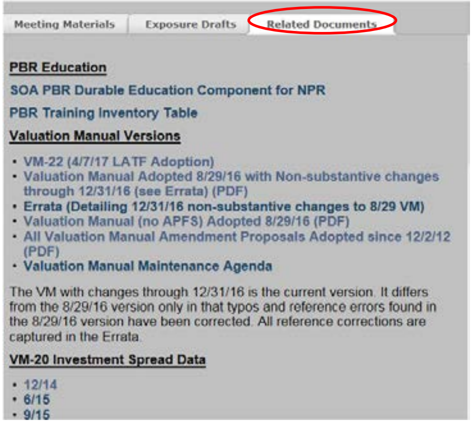
Valuation Manual

- ❑ Valuation Manual (VM) operative January 1, 2017
- ❑ VM-22 Amendment approved Summer 2017 NAIC meeting (Executive Committee)
  - Statutory Discount rates for Payout Annuities
- ❑ LATF continues to make amendments to the VM
  - Amendments primarily for Life Insurance PBR (VM-20); non-substantive for 2017
- ❑ Access to Valuation Manual and Amendments
  - LATF website under "Related Documents"
  - http://www.naic.org/cmte_a_latf.htm





- ❑ Academy Life & Health Valuation Law Manual - For Purchase
  - http://www.actuary.org/content/life-health-valuation-law-manual
  - 2017 version Includes VM with amendments through 8/26/2016

VM-22 Interest Rates for Payout Annuities

- Updates rate setting methodology to be more responsive to economic environment
  - Rates continue to be locked in for duration of the contract

- Effective 1/1/2018 for all new business (prospective)

- Effective for all states that have adopted the Valuation Manual

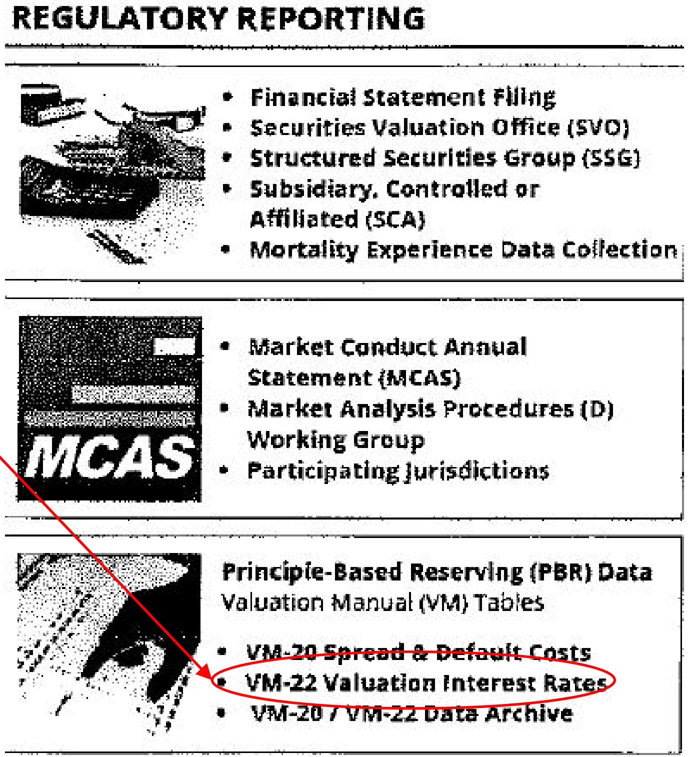
- Scope:

Immediate Annuities	Deferred Income Annuities
Group Pension Buy-outs	Structured Settlements
Annuitizations	GLIBs once contract funds exhausted

- Impact
  - Current Environment: Valuation Rates will be lower ↓

VM-22 Interest Rates: NAIC Resource

VM-22 Rates will be available on NAIC website approximately 5th business day of the quarter



VM-22 Payout Rates - Summary

	Item	Non-Jumbo	Jumbo
Application	Size	Premium < $250 million	Premium $\geq$ $250 million
	Rate Updates	Quarterly	Daily
	Reference Period	Based on Type of Annuity and Age	Based on Type of Annuity and Age
	Rate Buckets*	A through D	A through D
	Granularity	Contract Level/Certificate Level (Group)	Certificate Level
Calculation	Rate Basis	Treasuries plus Net Spreads	Treasuries plus Net Spreads
	Rounding	Nearest 25 basis points	Nearest basis point
	Formula	$I_q = R + S - D - E$	$I_d = I_q + C_d - C_q$

* Assigned as a Proxy for the liability duration

VM-22 Payout Rate Buckets and Reference Periods

- ❑ Rate Bucket assigned A through D
- ❑ Reference period for assignment is a proxy for liability duration
  - Length of Time from the Premium Determination Date to the date of the last non-life contingent payment
- ❑ Rate Bucket determined by initial (or rated) age and length of certain period payments

RATE BUCKETS

	Length of Reference Period (RP)			
Initial Age	RP ≤ 5Y	5Y < RP ≤ 10Y	10Y < RP ≤ 15Y	RP > 15Y
W/out Life	A	B	C	D
With Life				
90+	A	B	C	D
80-89	B	B	C	D
70-79	C	C	C	D
<70	D	D	D	D

VM-22 Non Jumbo Payout Annuity Rate Formula

$I_q = R + S - D - E$

- ❑ **R** is based on prior quarterly average Treasury Rates
- ❑ S is based on Spreads from VM-20
- ❑ D is based on Defaults from VM-20
- ❑ E is 0.25%

VM-22 Jumbo Payout Annuity Rate Formula

$I_d = I_q + C_d - C_q$

- ❑ I_q is quarterly valuation rate for calendar quarter
- ❑ C_d is daily corporate rate
- ❑ C_q is average daily corporate rate for period used to develop I_q

Corporate Rates: Bank of America Merrill Lynch Effective Yields

VM-22 Example – Non Jumbo Annuity $I_q = R + S - D - E$

- ❑ Single Premium Immediate Annuity
- ❑ Issued 4/30/2017
- ❑ Life only
- ❑ 72 years old

Rate Bucket “C” assigned to Contract

Length of Reference Period (RP)				
Initial Age	RP ≤ 5Y	5Y < RP ≤ 10Y	10Y < RP ≤ 15Y	RP > 15Y
Without Life	*A*	*B*	*C*	*D*
With Life				
90+	*A*	*B*	*C*	*D*
80-89	*B*	*B*	*C*	*D*
70-79	*C*	*C*	*C*	*D*
<70	*D*	*D*	*D*	*D*

VM-22 Weightings for Treasuries and Spreads and Defaults

$$I_q = R + S - D - E$$

- ❑ Derived to replicate approximate lifetime asset yield aligned with the liability cashflows
- ❑ Updated annually in Q4 using method prescribed in Appendix I of VM-22
- ❑ Applied to Treasuries and VM-20 Spreads and VM–20 Defaults

Weights				
Bucket	2 Year	5 Year	10 Year	30 Year
A	*26.8%*	*51.6%*	*20.7%*	*0.9%*
B	*10.1%*	*30.3%*	*50.0%*	*9.6%*
C	*4.7%*	*15.8%*	*50.2%*	*29.2%*
D	*2.5%*	*8.3%*	*28.8%*	*60.5%*

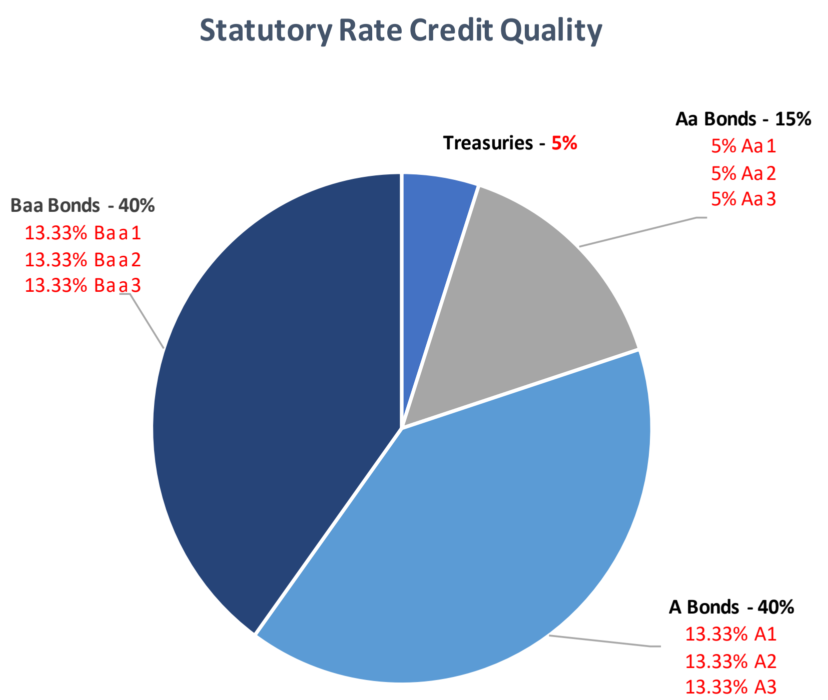
VM-22 Example – Non Jumbo Issue date 4/30/17

$I_q = R + S - D - E$

- ❑ R is the Treasury Rate weighted by Average Life for Bucket
- ❑ One quarter lag – 1/1/17 to 3/31/17
  - Source of Treasuries https://www.treasury.gov

WAL	2 Year	5 Year	10 Year	30 Year
(1) Avg Treasury 2Q 2017	1.24	1.95	2.45	3.05
(2) Bucket "C" Tsy Weights	4.7%	15.8%	50.2%	29.2%
Weighted Rate: (1) * (2)	0.0585	0.3078	1.2282	0.8895
"R" = Total Across WAL	2.48			

VM-22 Credit Quality %s for Spreads and Defaults



Example – Non Jumbo: Spreads

$I_q = R + S - D - E$

S is the Spread weighted by Quality and Average Life for Bucket

- Table F (3/31/2017) of VM-20 – Investment Grade Current Spreads
- Current Source: *Related Documents* on NAIC LATF site http://www.naic.org/cmte_a_latf.htm

Table F – Investment Grade Current Spreads (3/31/2017)										
WAL	Aa1/AA+	Aa2/AA	Aa3/AA-	A1/A+	A2/A	A3/A-	Baa/BBB+	Baa2/BBB	Baa3/BBB-	Wtd by Qual
2	41.36	53.23	57.98	62.74	67.49	76.66	85.82	94.99	156.54	**80.17**
5	51.13	60.43	67.82	75.21	82.60	97.89	113.19	128.49	173.29	**98.37**
10	73.21	79.28	88.35	97.42	106.49	125.38	144.27	163.16	190.62	**122.33**
30	130.88	144.91	150.17	155.44	160.71	185.50	210.30	235.10	226.59	**177.74**
Credit Quality %	*5.00%*	*5.00%*	*5.00%*	*13.33%*	*13.33%*	*13.33%*	*13.33%*	*13.33%*	*13.33%*	

WAL	2 Year	5 Year	10 Year	30 Year
(1) Avg Spread by Quality	80.17	98.37	122.33	177.74
(2) Bucket “C” Weights	*4.7%*	*15.8%*	*50.2%*	*29.2%*
Weighted Spread: (1)*(2)	3.77	15.54	61.41	51.90
“S” Total Across WAL	132.62			

Example – Non Jumbo: Defaults

$I_q = R + S - D - E$

D is the Default Cost weighted by Quality and Average Life for Bucket

- Table A (12/31/2016) of VM-20 Baseline Annual Default Costs
- Current Source: *Related Documents* on NAIC LATF site http://www.naic.org/cmte_a_latf.htm

Table A - Baseline Annual Default Costs in Basis Points										
WAL	Aa1/AA+	Aa2/AA	Aa3/AA-	A1/A+	A2/A	A3/A-	Baa/BBB+	Baa2/BBB	Baa3/BBB-	Wtd by Qual
2	0.32	0.84	2.01	3.91	7.40	9.96	18.61	32.46	75.42	19.85
5	0.97	2.13	4.45	8.19	14.69	18.71	28.28	42.35	85.89	26.78
10	1.49	2.98	5.97	10.48	18.08	23.09	33.63	48.84	88.11	30.15
Credit Quality %	*5.00%*	*5.00%*	*5.00%*	*13.33%*	*13.33%*	*13.33%*	*13.33%*	*13.33%*	*13.33%*	

WAL	2 Year	5 Year	10 Year
(1) Avg Spread by Quality	19.85	26.78	30.15
(2) Bucket “C” Weights	*4.7%*	*15.8%*	*79.4%*
Weighted Spread: (1)*(2)	0.9331	4.2318	23.9353
“D” Total Across WAL	29.10		

Final Rate Non Jumbo: Annuity Example

$I_q = R + S - D - E$

3.27% = 2.48% +1.33% - 0.29% - 0.25%

3.25% - Rounded to the nearest 25 basis points

Contrast: 2017 Type A Rate = 3.75%

R – Reference Rate	*2.48%*
S – Spread	*1.33%*
D – Default Cost	*0.29%*
E – 25 basis points	*0.25%*

VM-22 Payout Rates: Items for Discussion

- ❑ Product Specific - Nuances

- ❑ Exhibit 5 Reporting

- ❑ States without Valuation Manual Approval

VM-22 Payout Rates: Pricing Implications

- ❑ Updated Methodology should track better with current pricing rates
- ❑ Valuation Rate may not be determined at time of Pricing
  - Challenge exists today but stat rate not as sensitive
- ❑ Possible Disconnect between Rate Buckets e.g 15 yr period certain vs 16 year
- ❑ Quote Systems may not have same granularity of valuation buckets
- ❑ Annuitization/Two Tiered Annuity Pricing: Issue Date vs Annuitization Date

Non-Variable Annuity PBR

- Academy *Annuity Reserve Work Group* (ARWG)
  - Focus: PBR method consistent with Variable Annuities PBR (AG43/VM21)
  - Incorporating an Exclusion Test
  - Evaluating floor reserve approaches
  - Reviewing modifications to VM-21 to address Fixed Annuity Products
  - Monitoring VA QIS work

Modernization of Interest Rates for Deferred Annuities

- Academy *SVL Interest Rate Modernization Work Group*
  - Working on LATF request to update Statutory Rates for deferred annuities similar to work on SPIAs

- Deferred Annuity approach similar to work on SPIA
  - Single rate locked in at issue
  - Incorporates Representative Portfolio to link assets with liabilities
  - Consider Differentiation by Product Features including:
    - *Liquidity Provisions*
    - *Interest Rate Guarantees*
    - *Guarantee Duration*
    - *Guaranteed Living Benefits*
  - Coordination with PBR Work of ARWG

Risk Based Capital Items

RISK BASED CAPITAL ITEMS

- Risk Based Capital
  - C2 Longevity Risk
  - C1 Bond Factors
  - C1 Real Estate
  - C4 Operational Risk

RBC C-2 Longevity Risk

- ❑ Joint NAIC LATF/RBC Longevity Risk Subgroup
  - Subgroup Charge: Provide Recommendations for recognizing longevity risk in statutory reserves and/or RBC

- ❑ Academy *Longevity Risk Task Force (LRTF)* working on recommendation to present to NAIC
  - Evaluate current US and international practices for considering longevity risk in reserves and required capital for life and annuity products, and form a recommendation as to how an explicit longevity risk margin or charge should be incorporated into statutory reserve requirements, risk-based capital requirements, or both

- ❑ Risks Considered
  - Base table mis-estimation risk
  - Trend Risk (i.e. mortality improvement) ← Focus of LRTF
  - Short-term mortality volatility risk

RBC C-2 Longevity Risk – Findings/Conclusions to Date

- Reserves/Asset Adequacy Testing (AAT)
  - Current Consensus: Statutory reserves cover longevity risk via Asset Adequacy Analysis
  - Guidance added to Valuation Manual (VM-30) for Asset Adequacy Testing
    - Requires documentation of assumptions to include those related to mortality improvement
- RBC
  - Preliminary Approach is to develop simple factors
  - LRTF modelling to develop factors
- Field Study Proposal

RBC C1 Bond Factors

- C1 Bond Factors under review for several years
- Earliest effective date YE 2018
- Academy *Life Capital Adequacy C1 Work Group* developed recommendations
  - Updated proposal in June 2017 – NAIC exposed for comments
  - Comments received relative to the Portfolio Adjustment Factor
  - Updating their June 2017 proposal based on feedback
  - Expect refinements to proposed Portfolio Adjustment and Base Factors
- Resource: NAIC Investment RBC Working Group

  http://www.naic.org/cmte_e_investment_rbc_wg.htm

RBC C-1 Bond - Base Factors

- NAIC Bond Categories expanded from 6 to 20
- Generally: Investment Grade ↑ Below Investment Grade ↓

Bond Category	Current	June 2017 Proposal
Aaa	0.40%	0.22%
Aa1	0.40%	0.32%
Aa2	0.40%	0.44%
Aa3	0.40%	0.56%
A1	0.40%	0.68%
A2	0.40%	0.82%
A3	0.40%	0.98%
Baa1	1.30%	1.13%
Baa2	1.30%	1.32%
Baa3	1.30%	1.57%
Ba1	4.60%	2.88%
Ba2	4.60%	3.74%
Ba3	4.60%	4.89%
B1	10.00%	5.07%
B2	10.00%	6.89%
B3	10.00%	9.45%
Caa1	23.00%	13.87%
Caa2	23.00%	19.02%
Caa3	23.00%	29.06%

RBC C-1 Bond Portfolio Adjustment Factors

Portfolio Adjustment Factor: Reflect differences between a Company's bond portfolio and the representative portfolio used to derive base factors

Current Portfolio Adjustment Factors		
	# of Issuers	Factor
Up to	50	2.50
Next	50	1.30
Next	300	1.00
Over	400	0.90

June 2017 Portfolio Adjustment Recommendation		
	# of Issuers	Factor
Up to	20	6.75
Next	130	1.70
Next	250	1.05
Next	500	1.00
Over	900	0.95

	Old	Proposal
100 Issuers	{(50 * 2.50) + (50 * 1.30)}/ 100 = 1.90	{(20 * 6.75) + (80 * 1.70)}/ 100 = 2.71
500 Issuers	1.16	1.44
2500 Issuers	0.95	1.06

RBC C1 Bond Factors - Estimated Industry Impacts*

- C1 Charge for Bonds increased from 1.35% to 1.67%
  - Based on 12/31/2011 NAIC Data of 700 life insurance companies
  - Before-tax, before-covariance basis before any top 10 adjustments

- Individual insurers results will differ from the average

* American Academy of Actuaries " Updated Recommendation of Corporate Bond Risk-Based Capital (RBC) Factors" dated 6/8/17

RBC C-1 Real Estate

- Updated RBC Factors for Real Estate exposed March 2017
  - Factors to more accurately reflect sector's underlying risks and promote consistency with other asset classes
- Goal: Real Estate factors effective same time as new C-1 Bond Factors
- Proposal still under development

RBC C-4 Operational Risk

- NAIC Operational Risk (E) Subgroup formed to study Operational Risks

- Academy *Operational Risk Work Group* assisting NAIC with analysis
  - Comment Letter May 25, 2017

- 2018 Expected Implementation
  - Delay from 2017 effective date because of “double-counting” for subsidiaries

RBC C-4 Operational Risk

- "Add-on" Approach
  - Factor applied to Total Adjusted Capital (TAC)
  - Offset is given for the Current C-4a charge -

    i.e. Direct Premium Exposure (3.08% Premium) and 0.08% SA liabilities
  - Proposed 3% Floor
    - Current C-4a risk charge is assumed to include some operational risk

- Expectation of continued refinement after 2018

SOA Regulatory Resources

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Regulatory Resources

SOA Regulatory Resource Site

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Variable Annuities Statutory Reserve Framework Update

Rich Harris, FSA, FCIA, MAAA

VP & US Appointed Actuary

John Hancock

Development of Refinements to C3P2 and AG43

October 16, 2017

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AG43 & C3P2 Applicability

- Individual variable deferred annuities regardless of whether they contain living or death benefits
- Variable immediate annuities
- Group variable deferred annuities which contain living or death benefits

C3P2

- Enacted by NAIC in 2006 to address equity risk, interest rate risk, and expense recovery risk for covered products
- Uses stochastic valuation with post-tax CTE(90) calculation for determining Total Asset Requirement (TAR)
- Stochastic assumptions based on “prudent best estimate”, defined as best estimate with a margin for estimation error
- Deterministic standard scenario floor used if it produces a greater TAR than the stochastic calculation
- RBC is calculated as the excess (if any) of TAR over statutory reserves

AG43

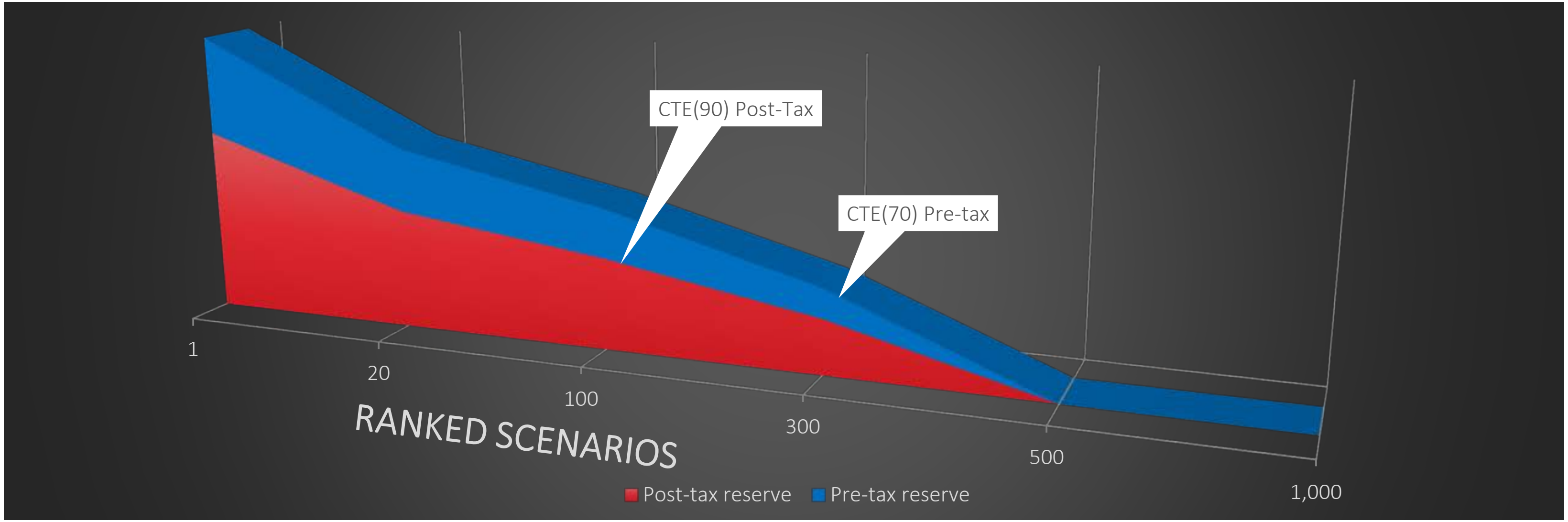
- Enacted by NAIC in 2009
- Defines CARVM for Variable Annuities, commonly called VACARVM
- Stochastic calculation is based on pre-tax CTE(70)
- Similar to C3P2 requirements in order to allow the same model to be used for both requirements
- Deterministic standard scenario floor used if it produces a greater reserve than the stochastic calculation

Differences in Reserve & Capital Requirements - Stochastic

AG43	C3P2

• Pre-tax CTE(70)
• Interest rates for reinvestment can be based on:
  • Integrated equity/interest rate model, or
  • Forward rates from current swap curve
  • AAA scenarios for C3P1
• Revenue sharing can be reflected with a prescribed phase-out for non-guaranteed payments
	• Post-tax CTE(90)
	• Interest rates for reinvestment can be based on:
	  • Integrated equity/interest rate model, or
	  • Forward rates from current swap curve
	• Revenue sharing can be reflected with an appropriate margin for uncertainty of non-guaranteed payments

CTE calculations under current AG43 & C3P2



- Total Asset Requirement = CTE(90) Post-Tax – CTE(70) Pre-tax (floored at zero)
- CTE(90) Post-tax calculated on C3P2 basis, CTE(70) Pre-tax calculated on AG43 basis

Differences in Reserve & Capital Requirements - Standard Scenario

AG43	C3P2
• Standard Scenario assumes equity shock followed by recovery • Prescribed margins for projected revenue • Issue year based discount rates	• More severe standard scenario equity shock and lower recovery rates • Smaller margins allowed • Discount rate based on 10-year treasury rate at valuation date

Shortcomings in Current Framework

- Disconnect between AG43 and C3P2 requirements causes capital and reserve movements to not be in tandem
- TAR can be less than AG43 reserve, leading to no capital requirement
- Differences between AG43 and C3P2 prevents effective hedging of statutory funding requirements
- Non-economic reserves caused by “working reserve”

Shortcomings in Current Framework (continued)

- Non-economic reserves caused by overly conservative phase-out of revenue sharing
- Capital requirements triggered by shocks often exceed payoffs from economic hedges
- Material disconnects between tax reserves and capital requirements can lead to large tax payments at the same time as capital requirement increases

Industry Reactions

- Disconnect between capital and reserve requirements have led to the common use of "voluntary reserves"
  - Since TAR and reserves are calculated independently, strengthening statutory reserves decreases the RBC requirements
  - A company that voluntarily holds a higher statutory reserve than required under AG43 can decrease the amount of capital needed under C3P2 to reach their target RBC ratio
- Capital volatility has led to common use of offshore or onshore captive reinsurance
- Some direct writers have reduced or eliminated new sales
- Reinsurance market has become more limited
- Framework puts companies that hedge to the economics of the business at a disadvantage. This may impact actual hedging strategies.

Framework Redesign – QIS

- In 2015 NAIC engaged Oliver Wyman (OW) to provide recommendations that would reduce captive reinsurance use and achieve the following specific goals:
  - Mitigate the asset-liability accounting mismatch between hedge instruments and statutory liabilities
  - Remove non-economic volatility in statutory capital charges and resultant solvency ratios
  - Facilitate greater harmonization across insurers and products for greater comparability
- After OW provided a preliminary assessment a Quantitative Impact Study (QIS) was performed in 2016
- Further refinements were made to the OW proposal after QIS and draft reserve and capital guidelines were produced

Framework Redesign – QIS2

- Another Quantitative Impact Study (QIS2) is currently underway to assess refined proposal
- 13 industry participants are contributing and being supported by input from the NAIC Variable Annuities Issues Working Group (VAIWG)
- Conducted in 3 distinct testing cycles
- Estimated completion for QIS2 is late 2017
- Regular communication between industry, OW and regulators is allowing testing requirements to be shaped by prior cycle results as well as requests from industry and regulators

Framework Redesign – Major Changes

- Align economically-focused hedge assets with liability valuations
  - Hedge accounting changes
  - Remove working reserve
  - Hedge effectiveness factor up to 100% when appropriate
- Reform Standard Scenarios (AG43 and C3P2)
  - Remove C3P2 standard scenario
  - Prescribed behavioral assumptions being refreshed to reflect industry experience since original AG43 experience studies
  - Aligning calculation methodology closer to stochastic
  - Ensure framework will work as intended for more robust portfolio of products

Framework Redesign – Major Changes (continued)

- Align TAR and reserves
  - Same framework will be used for AG43 and C3P2
- Revise asset admissibility for derivatives and DTAs
  - Increase admissibility for VA hedges
  - Increase VA reserve DTA admissibility
- Standardize capital markets assumptions
  - General account fixed income returns consistent with interest rate scenarios
  - Harmonize practices in scenario generation and increase consistency with real-world observations
  - Possible revisions to equity calibration criteria or scenario generation framework to reflect changing environments
  - Harmonize practice through additional prescription/calibration/governance

Framework Redesign – Major Changes (continued)

- “CTE High”
  - Proposal to use a significantly higher CTE level for required capital than current CTE(90)
  - Allows more tail risk to be reflected
  - Provides more benefit (or less penalty) from hedge programs
    - Many companies don’t see benefits from hedging until very high CTE levels
  - In order to maintain comparability with current level of risk embedded in C3P2 required capital, a scalar of the CTE High less CTE(70) value will be used for calculating required capital
  - Possible implementation is 25% scalar with CTE(98)
    - Other combinations of scalars and CTE levels are being considered

References

- Recommended Approach for Setting Regulatory Risk-Based Capital Requirements for Variable Annuities and Similar Products
  - http://www.actuary.org/pdf/life/c3_june05.pdf
- The Application of C-3 Phase II and Actuarial Guideline XLIII
  - https://www.actuary.org/files/VAPN%20FINAL%20WEB%20040511.4.pdf/VAPN%20FINAL%20WEB%20040511.4.pdf
- NAIC VA Reserve and Capital Reform – Recommended Revisions To AG43 & C3P2
  - http://www.naic.org/documents/committees_e_va_issues_wg_160823_rec_pre.pdf

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