2015

Casualty Loss Reserve Seminar

Atlanta, GA

P/C BCAR
The New Generation

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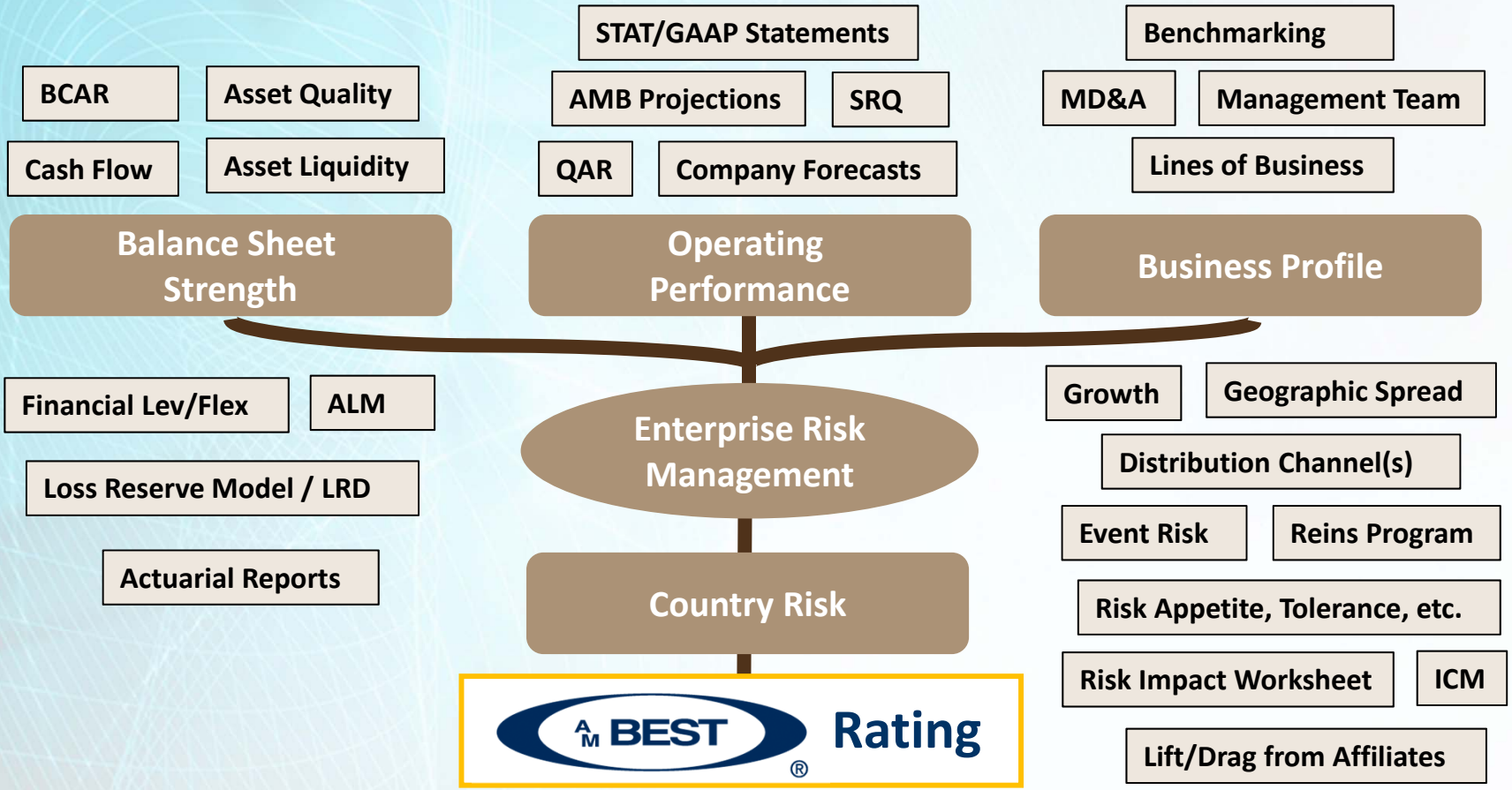
Disclaimer

Agenda

- AMB Rating Methodology – role of BCAR in the determination of a credit rating
- Current BCAR structure
- Reasons for proposed changes
- Overview of proposed changes & work to date
- Preliminary observations
- Next Steps
- Proposed implementation time frame

General Rating Process

What is the relationship between BCAR and a rating level?



How is BCAR Used?

- As an analytical tool
- Indication of current balance sheet strength
- Proforma projections
- Stress tests…Natural Cats…Terrorism
- Other what if scenarios
  - Changes to reinsurance
  - Business acquisition or disposition
  - Changes in asset (or liability) mix
  - US government default
- Most important … it is a basis for discussion

Current Structure – PC BCAR

BCAR Ratio = Adjusted Surplus / Net Required Capital

Adjusted Surplus (APHS)

- Reported Surplus (PHS)
- Equity Adjustments:
  - Unearned Premiums (DAC)
  - Equalization/Contingency Reserves
  - Loss Reserves
  - Assets
- Debt Adjustments:
  - Surplus Notes
  - Debt Service Requirements
- Other Adjustments:
  - Future Operating Losses
  - Potential Catastrophe Loss
  - Future Dividends
  - Goodwill
  - Other Intangible Assets
  - Minority Interests, etc.

Net Required Capital

- Gross Required Capital (GRC):
  - (B1) Fixed Income Securities
  - (B2) Equity Securities
  - (B3) Interest Rate
  - (B4) Credit
  - (B5) Loss and LAE Reserves
  - (B6) Net Premiums Written
  - (B7) Off-Balance Sheet
- Covariance Adjustment
- Net Required Capital (NRC)*

*NRC= $\text{SQRT}\left[(B1)^2+(B2)^2+(B3)^2+(0.5*B4)^2 +[(0.5*B4)+B5)]^2+(B6)^2 \right] + B7$

Reasons for Proposed Changes

- More sophisticated and faster software available now
  - Simulations / probability curves
  - Economic scenario generators (ESGs)
  - Correlations / diversification
  - Company specific detail
    - Assets
    - Reinsurers
    - Profitability
    - Volatility

Reasons for Proposed Changes

- Metrics better understood and utilized by industry
  - Tail Value at Risk (TVaR)…aka Conditional Tail Expectation (CTE)
    - ✓ Average loss beyond a given threshold
    - ✓ Threshold is a percentile (ie 99%)
    - ✓ Considers size of losses beyond threshold
  - Value at Risk (VaR) … aka Probability of Default
    - ✓ Probability loss will exceed a given threshold
- Consistent confidence intervals across risks
  - 98%, 99%, 99.5%, 99.8%, 99.9%

Reasons for Proposed Changes

- Consistent Time Horizon for risk factors
  - Runoff to Ultimate basis for PC UW capital factors
    - ✓Protects policyholders & claimants
    - ✓No change from current view
  - Some risks will need to use duration of liabilities as indicator for ultimate risk
    - ✓Credit risk on recoverables
  - Bonds – duration of bonds
  - Common stocks – one year

Overview of Proposed Changes & Work to Date

- Do not intend to change underlying view of the risks
  - Bonds – default risk
  - Common stock – price volatility
  - Reinsurance credit risk – uncollectible recoverables
  - Pricing risk – potential for UW loss on business written next year
  - Reserve risk – potential for unanticipated adverse reserve development
- Do not intend to change the main structure of the model
- Goal is to generate risk factors using stochastic simulations from probability curves & ESG

Overview of Proposed Changes & Work to Date

- Phase 1 – Bonds
  - Use Economic Scenario Generator
  - Update ***bond default*** risk factors
    - ✓ Reflect duration of company's bond portfolio (SRQ)
    - ✓ Reflect asset quality of company's bond portfolio (SRQ)
    - ✓ Reflect volatility in bond default assumptions (stochastic portion - tied to ESG)
    - ✓ Only defaults occurring in first 10 years are considered
    - ✓ Offset default with recovery on defaults (vary by rating)
    - ✓ Net defaulted amounts are present valued
    - ✓ Looked at TVaR metric
    - ✓ Currently looking at VaR metric

Overview of Proposed Changes & Work to Date

Bond Quality & Maturity SRQ question:

3b.FIXED INCOME PORTFOLIO ANALYSIS: Please complete the following Quality and Maturity Distribution of All Bonds Owned as of December 31, 2013. Please show US Governments on line 18, and show Parents, Subsidiaries, and Affiliates on line 19. Dollar amounts should be stated at Book/Adjusted carrying values (in $000s). Number of Issuers should be provided in whole numbers and represents the number of bond issuers associated with the dollar amount of bonds expiring at that maturity date and rating.

(01)	Maturing in 1 Year of Less		Maturing in Over 1 Year Through 3 Years		Maturing in Over 3 Years Through 5 Years		Maturing in Over 5 Years Through 10 Years		Maturing in Over 10 Years Through 20 Years		Maturing in Over 20 Years		Total
Rating (or equivalent to rating)	(02) Amount ($000)	(03) Number of Issuers	(04) Amount ($000)	(05) Number of Issuers	(06) Amount ($000)	(07) Number of Issuers	(08) Amount ($000)	(09) Number of Issuers	(10) Amount ($000)	(11) Number of Issuers	(12) Amount ($000)	(13) Number of Issuers	(14) Amount ($000)
1. AAA													
2. AA+													
3. AA													
4. AA-													
5. A+													
6. A													
7. A-													
8. BBB+													
9. BBB													
10. BBB-													
11. BB+													
12. BB													
13. BB-													
14. B+ to B-													
15. CCC+ to CCC-													
16. CC to C													
17. D (in or near default)													
18. U.S. Governments*		XXX		XXX		XXX		XXX		XXX		XXX	
19. Parents, Subsidiaries, & Affiliates**													
20. All Other													
21. TOTAL (Lines 1 through 20)***													

*Row 18 Column 14 Total should match NAIC annual statement Schedule D Part 1A Section 1 Line 1.7 Column 6 (divided by 1000).
**Row 19 Column 14 Total should match NAIC annual statement Schedule D Part 1A Section 1 Line 8.7 Column 6 (divided by 1000).
***Row 21 Column 14 Total should match NAIC annual statement Schedule D Part 1A Section 1 Line 9.7 Column 6 (divided by 1000).

Overview of Proposed Changes & Work to Date

- Phase 1 – Common Stock
  - Use Economic Scenario Generator
  - Update ***common stock*** risk factors
    - ✓Reflect type of stocks held by company (SRQ – Beta)
    - ✓Reflect volatility (stochastic portion – tied to ESG)
    - ✓Can cap simulated downside risk
    - ✓Looked at TVaR metric
    - ✓Currently looking at VaR metric

Overview of Proposed Changes & Work to Date

Common Stock Beta SRQ Question:

I. ASSET SECTION (Continued)

3c. **COMMON STOCK PORTFOLIO ANALYSIS:** Please enter the "Beta" and the associated "R-Squared" of your company's publicly traded common stock portfolio as of December 31, 2013 (including publicly traded Parent, Subsidiary, and Affiliated common stock). The "Beta" represents the level of movement in the market value of common stocks owned relative to the stock market as a whole over a specified period of time. "R-Squared" measures how reliable the calculated "Beta" is.

The stock portfolio should be separated based upon the country of the exchange in which the stock is traded. If a stock is traded on exchanges in multiple countries, only include it in one of the countries. If the total market value of the common stocks that are traded in a particular country is less than 5% of the rating unit's total publicly traded common stock portfolio market value, then a response for that country is not required.

Please use the Aggregate Method to calculate the portfolio Beta based upon the specified index shown. The Aggregate Method portfolio Beta at year end is determined by a simple linear regression using 52 weeks of time weighted rates of return for the entire portfolio. When using the value of the publicly traded common stock portfolio in the calculation of the Beta, do not include the effects of any hedging on the portfolio. For companies that do not want the administrative expense of calculating the portfolio Beta, please enter a Beta of 1.50 and R-Squared of 1.00 along with the market value of the common stocks in that portfolio.

Publicly Traded Common Stocks

(01) Location of Domestic Exchange on which Common Stocks are Traded	(02) Market Value @12/31/2013 (in $000s)	(03) Beta	(04) R-Squared	(05) Index Used to Calculate Beta & R-Squared
1. United States of America				S&P 500
2. Canada				S&P/TSX Composite
3. United Kingdom				FT All Shares
4. Japan				TOPIX
5. Other (please specify)				Please specify:
6. Other (please specify)				Please specify:
7. Other (please specify)				Please specify:
8. TOTAL (Lines 1 through 7)		X X X	X X X	X X X

Overview of Proposed Changes & Work to Date

- Phase 1 – Reinsurance
  - Update ***reinsurance credit*** risk factors
    - ✓ Reflect type of recoverable (paid, unpaid, upr)
    - ✓ Reflect rating of each reinsurer (Schedule F and ratings data)
    - ✓ Reflect concentration risk (how many reinsurers)
    - ✓ Reflect duration of recoverables (out to 30 years)
    - ✓ Reflect partial recovery when reinsurer impairment occurs
    - ✓ Simulate 10,000 impairment scenarios for each reinsurer
      - ✓ Only uses impairments occurring in first 10 years
      - ✓ Sums up entire amount of recovs associated with that impairment
        - ✓ (i.e. if impairment in year 1, and recovs collected over 30 years, then all 30 years of recovs counted in that impairment)
      - ✓ Amounts are present valued
    - ✓ Looked at TVaR metric
    - ✓ Currently looking at VaR metric

Overview of Proposed Changes & Work to Date

- Phase 1 – PC Premium
  - Update PC ***premium risk*** factors
    - ✓ Create Industry UW Loss probability curves
      - 21 Schedule P lines and 4 NPW size categories (VS,S,M,L)
      - 84 industry probability curves for premiums
    - ✓ Use company's NPW size (by line) to select industry probability curve
      - use company profitability (by line) to adjust curve
    - ✓ Simulate 10,000 UW profit/loss scenarios for each line
    - ✓ Reflect diversification across lines
      - use one of 4 industry correlation matrices
      - based on size of company's total NPW (VS,S,M,L)
    - ✓ Looked at risk factors based on TVaR metric
    - ✓ Currently looking at VaR metric

Overview of Proposed Changes & Work to Date

- Phase 1 – PC Reserves
  - Update PC ***reserve*** risk Factors
    - ✓ Create industry unanticipated adverse development probability curves
      - 21 Schedule P lines and 4 reserve size categories (VS,S,M,L)
      - 84 industry probability curves for reserves
    - ✓ Use company Reserve size (by line) to select industry probability curve
      - use company volatility (by line) to adjust curve
    - ✓ Simulate 10,000 reserve development scenarios for each line
    - ✓ Reflect diversification across lines
      - use one of 4 industry correlation matrices
      - based on size of company's total net reserves (VS,S,M,L)
    - ✓ Looked at risk factors based on TVaR metric
    - ✓ Currently looking at VaR metric

Overview of Proposed Changes & Work to Date

- Phase 1 – Natural Catastrophe
  - Update ***natural catastrophe*** approach – many questions:
    - ✓ Var or TVaR metric?
    - ✓ Occurrence vs. aggregate season?
    - ✓ Total all perils?
    - ✓ Currently different VaRs for EQ and Wind
    - ✓ Straight charge to PHS or add to NRC?
    - ✓ Confidence level?
    - ✓ Continue stress test approach?
  - ✓ Looked at TVaR Aggregate Season Total All Perils
    - ✓ Most conservative view

Overview of Proposed Changes & Work to Date

- Phase 1 – Natural Catastrophe
  - Update ***natural catastrophe*** approach –
  - Currently testing with:
    - ✓ Per Occurrence
    - ✓ Total all perils
    - ✓ Measured at various VaR levels
    - ✓ Risk added to Net Required Capital
    - ✓ Will continue stress test approach
    - ✓ Will stress higher VaR levels if concerned with tail risk
    - ✓ Reinstatement premium and Tax adjustments remain
    - ✓ Terrorism and other stress tests remain

Overview of Proposed Changes & Work to Date

Natural Catastrophe SRQ Question:

IV. OPERATIONS SECTION (Continued)

CATASTROPHE EXPOSURE (Cont.): (19a) _____

(Hurricane, Earthquake (incl. Fire), Tornado/Hail, Winter Storm/Freeze, Other, or All Perils Combined)

CATASTROPHE LOSS ANALYSIS METHODOLOGY: (19b) _____

(Computer Model #1, Computer Model #2, Computer Model #3, Other Estimate, or Management View)

If Computer Model, please list Catastrophe Model Vendor Name: _____ Model Version: _____ Modeling performed by: _____

If "Other Estimate" please explain : _____

20a. QUANTIFICATION OF POTENTIAL CATASTROPHE LOSS: In the table below, please state the estimated losses to your rating unit from the catastrophe risk exposure indicated within question 19 and its impact on your rating unit's 2014 year-end policyholders' surplus. We have requested probable maximum losses on both a per occurrence basis and on an aggregate basis for loss return periods of 20, 50, 100, 200, 250, 500, and 1,000 years in order to gauge your rating unit's relative exposure. A 50 year return period coincides with a 2% annual probability that such a loss will occur; a 100 year return period represents a 1% annual probability; and so forth. This should include your company's worldwide exposure. Please supply data for all loss return periods. Responses should exclude the benefits from catastrophe bonds, industry loss warranties, and other non-traditional risk mitigation transactions.

Indicated CAT Risk Based upon Worldwide Exposures	2014 GROSS LOSSES* (I)				2014 PRE-TAX NET LOSSES* (II)			
	PER OCCURRENCE		AGGREGATE**		PER OCCURRENCE		AGGREGATE**	
Loss Return Period (Annual Probability)	(01) Probable Maximum Loss (PML) ($000s)	(02) TVAR or TCE*** ($000s)	(03) Probable Maximum Loss (PML) ($000s)	(04) TVAR or TCE*** ($000s)	(05) PML (Including Reinstatement Costs) ($000s)	(06) TVAR or TCE*** (Excluding Reinstatement Costs) ($000s)	(07) PML (excluding Reinstatement Costs) ($000s)	(08) TVAR or TCE*** (Excluding Reinstatement Costs) ($000s)
1. 20 Years (5.0%)								
2. 50 Years (2.0%)								
3. 100 Years (1.0%)								
4. 200 Years (0.5%)								
5. 250 Years (0.4%)								
6. 500 Years (0.2%)								
7. 1,000 Years (0.1%)								

*Assume that events are equally likely to occur at any time in a 24 hour day (i.e. Random time).

**Reflects the impact of multiple events in a given year or season.

***TVAR (Tail Value at Risk) or TCE (Tail Conditional Expectation)

Overview of Proposed Changes & Work to Date

- Phase 2
  - Remaining asset classes
  - Life and annuity risks
    - ✓ Mortality
    - ✓ Longevity
    - ✓ Disintermediation
    - ✓ Product Guarantees
    - ✓ Long Term Care/Disability
  - Change net required capital formula to correlation matrix approach (instead of the square root rule)

Proposed Structure – PC BCAR

BCAR Ratio = Adjusted Surplus / Net Required Capital

Adjusted Surplus (APHS)

- Reported Surplus (PHS)
- Equity Adjustments:
  - Unearned Premiums (DAC)
  - Equalization/Contingency Reserves
  - Loss Reserves
  - Assets
- Debt Adjustments:
  - Surplus Notes
  - Debt Service Requirements
- Other Adjustments:
  - Future Operating Losses
  - Potential Loss
  - Future Dividends
  - Goodwill
  - Other Intangible Assets
  - Minority Interests, etc.

Net Required Capital

Gross Required Capital (GRC):

- (B1) Fixed Income Securities
- (B2) Equity Securities
- (B3) Interest Rate
- (B4) Credit
- (B5) Loss and LAE Reserves
- (B6) Net Premiums Written
- (B7) Off-Balance Sheet
- (B8) Catastrophe Exposure

Covariance Adjustment

Net Required Capital (NRC)*

*NRC= SQRT [$(B1)^2+(B2)^2+(B3)^2+(0.5*B4)^2+[(0.5*B4)+B5)]^2+(B6)^2$] + B7 + B8

Example of Impact to PC Model

Current Calculation

APHS (ex Potential Cat Losses) = $150M
Potential cat Losses = $30M
NRC = $80M

$$BCAR = \frac{(150-30)}{80} = \frac{120}{80} = 150$$

Planned Calculation

APHS (ex Potential Cat Losses) = $150M
Potential cat Losses = $30M
NRC = $80M

$$BCAR = \frac{150}{(80+30)} = \frac{150}{110} = 136$$

Example of Impact to PC Model

Current Calculation		
a. APHS (excl Potential Cat Losses) =	150	M
b. Potential Cat Losses =	30	M
c. Net Required Capital (excl Cat Losses) =	80	M
BCAR = (a - b) / (c) =	150.0	

Planned Calculation	VaR 98	VaR 99	VaR 99.5	VaR 99.8	VaR 99.9	
a. APHS (excl Potential Cat Losses) =	150	150	150	150	150	M
b. Potential Cat Losses =	20	30	40	50	60	M
c. Net Required Capital (excl Cat Losses) =	75	80	85	90	95	M
BCAR = (a) / (b + c) =	157.9	136.4	120.0	107.1	96.8	

Notes: APHS is the same at each confidence level.
Net Required Capital increases as confidence level increases.

Observations

- TVaR
  - Issues with catastrophe losses and the impact of extreme tail events
  - May go beyond what is needed from BCAR
  - Not as well understood by management as initially thought
  - Can't manage down those extreme tail events
  - Management uses VaR
- VaR
  - Can use VaR if we slide out farther into the tail
    - Higher confidence levels than those used for TVaR
  - Show BCAR at various confidence levels

Observations

- Time Horizon for risk factors
  - Ultimate basis for:
    - Reserve Risk
    - Pricing Risk
  - Using a 10 year period for:
    - Bond defaults
    - Reinsurer impairments
  - Common stocks
    - One year
- Ratings are reviewed annually
  - Provides a reasonable perspective, but recognizes how BCAR fits into the overall rating analysis

Observations

- Investments
  - Greater risk than previous considered, particularly in equities
  - Bond charges are slightly higher on investment grade
  - Impact on PC companies has been tested
    - Not material impact on most PC BCARs

		Average Risk Factors of Sample PC Companies				
Asset Risk Factor for:	Current PC BCAR	VaR 98	VaR 99	VaR 99.5	VaR 99.8	VaR 99.9
US Gov't	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
NAIC Class 1 Bonds	1.0%	1.2%	1.5%	1.7%	2.0%	2.4%
NAIC Class 2 Bonds	2.0%	5.4%	6.2%	6.8%	7.5%	8.4%
NAIC Class 3 Bonds	4.0%	10.0%	11.0%	11.8%	12.8%	13.7%
NAIC Class 4 Bonds	4.5%	23.3%	24.7%	25.8%	27.0%	27.8%
NAIC Class 5 Bonds	10.0%	37.6%	38.3%	38.9%	39.5%	39.9%
NAIC Class 6 Bonds	30.0%	45.5%	46.6%	47.5%	48.3%	49.2%
Total Bonds	1.0%	1.8%	2.1%	2.3%	2.7%	3.1%
Publicly Traded Common Stocks	15.0%	33.9%	39.1%	43.8%	47.3%	48.3%

Observations

- Reinsurance
  - Charges higher than current BCAR in tail
    - depending on reinsurer(s) and duration of liability
    - reflects severity of impairment
  - Combination of discounting and no impairments beyond 10 years has reduced initial charges slightly
- PC Underwriting (Reserves and Premium)
  - Auto risk factors lower than current BCAR – not surprised by this
  - WC, GL, MPL risk factors slightly higher than current BCAR

Observations

- Sample of "Medium" PC Mutuals

		Average Risk Factors of Sample Companies				
Asset Risk Factor for:	Current	VaR 98	VaR 99	VaR 99.5	VaR 99.8	VaR 99.9
Total Bonds	1.0%	1.5%	1.8%	2.1%	2.4%	2.8%
Publicly Traded Common Stocks	15.7%	38.0%	43.9%	49.1%	53.0%	54.2%
Publicly Traded Common Stocks*	15.9%	34.0%	39.3%	43.9%	47.5%	48.5%
* Excludes Cos. w/Beta of 1.50						
Reserve Risk	31.5%	30.2%	35.3%	39.7%	45.5%	50.1%
Reserve Diversification	86.6%	88.1%	87.1%	85.9%	85.5%	84.1%
NPW Risk	38.4%	32.1%	37.5%	42.9%	49.5%	54.5%
NPW Diversification	86.7%	89.4%	89.4%	89.4%	89.6%	90.8%
BCAR	309.2%	271.5%	235.1%	184.7%	133.3%	105.9%

Observations

- ***Next generation BCAR*** as an indication of current balance sheet strength…what do scores say about relative financial strength?

	98%	99%	99.5%
Company A	178 (A++)	111	83
Company B	178 (A++)	126	103
Company C	152 (A)	128	116

Observations

- Catastrophe Exposure
  - Model will highlight companies with limited tail coverage
    - Because we are looking at BCAR at VaR levels above 99%
    - Higher rated companies are expected to have more tail coverage

- BCAR Guidelines
  - Target for B+/bbb- level likely to be VaR 99

Next Steps

- Continue to evaluate VaR based output (Life and Universal models)
- How should liquidity needs be considered
- Are there any unintended consequences
- Industry discussions
  - We have had a few, but we have more people to talk to
- Draft Methodology Criteria Procedure
  - Re-write of Property Casualty
  - Update to other areas (Life, Universal, Health, Canadian, Title)
  - Release of methodology updates will be staggered
  - Lengthy comment period

Expected Timeline

- Model being developed in phases
  - Phase 1 built – testing internally with 2013 YE data
    - ✓ Parameters completed
    - ✓ Run BCARs (PC; LH; Universal) internally with 2014 YE data
    - ✓ Draft criteria expected to be released late this summer for comment
    - ✓ We do anticipate sharing 2014 YE output with companies as draft criteria are released
    - ✓ **Time frames for final criteria release will be impacted by comments received on criteria, changes based on comments, & LH impact study**
      - Likely roll-out for Phase 1 components will be 2Q 2016 for year-end 2015 financials
  - Phase 2 – 1 year after Phase 1 finalized

Thank You!

Questions/Comments?

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