

# Understanding BCAR for U.S. and Canadian Life/Health Insurers

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**5 December 2016**

# Agenda



- Overview of BCAR
- Summary of Model Changes
- Available Capital
- Net Required Capital
- Application of BCAR in the Rating Process

# The Building Block Approach



- The building blocks themselves will remain the same
- Components of the building blocks are currently out for comment

## A.M. Best's Rating Process



*Best's Capital Adequacy Ratio (BCAR)* is a comprehensive quantitative tool that evaluates many of the risks to the balance sheet simultaneously and generates an overall estimate of the required level of capital to support those risks and compares it with available capital

BCAR is a key tool in the assessment of balance sheet strength

- Not the sole determinant of balance sheet strength
- Not the sole determinant of the rating

# Model Changes



- Not intended to change underlying view of the risks
- Not intended to change the main risk categories of the models

## **Goals are to:**

- Apply stochastic-based risk factors within the model, with factors generated using stochastic simulations from probability curves & ESG
- Incorporate company-specific detailed data from A.M. Best's Supplemental Rating Questionnaire & financial statements

# Model Changes



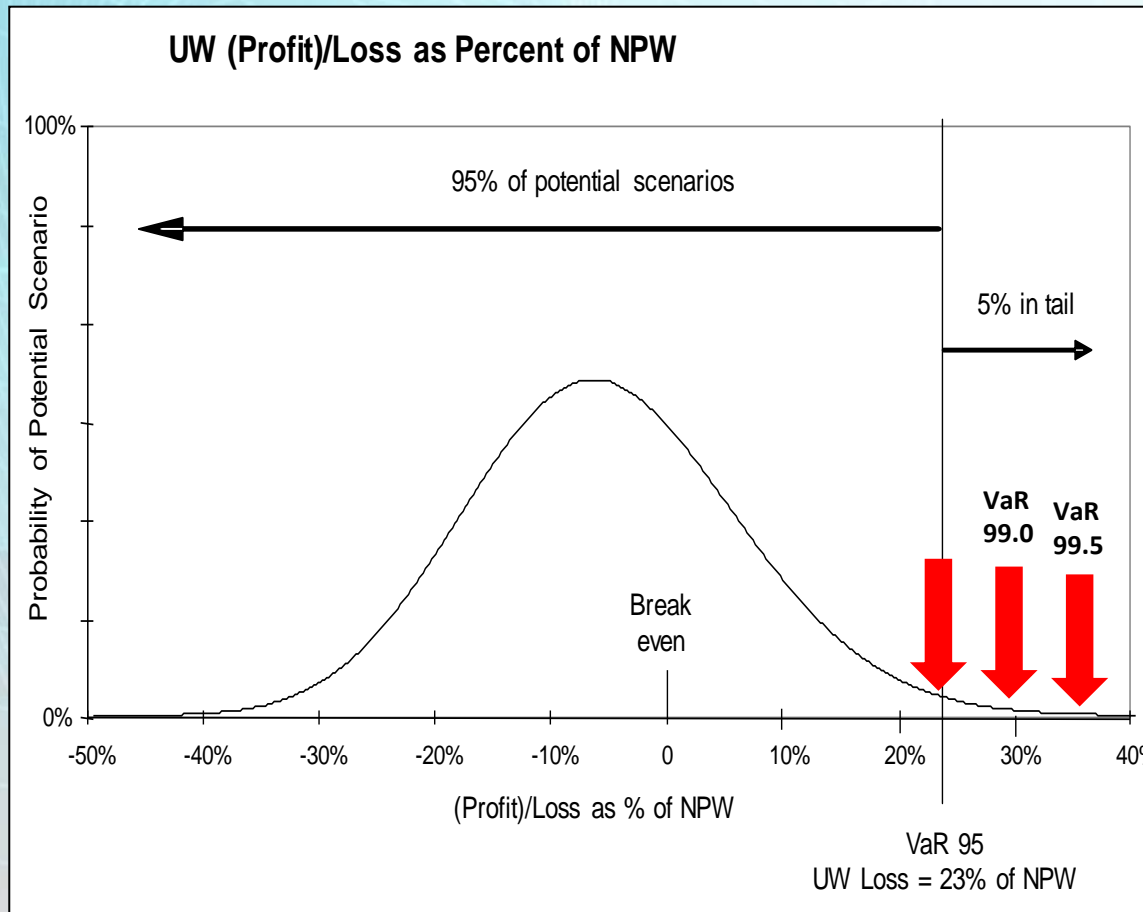
- No stochastic simulation is done within the BCAR model
- The ESG is a computer model that randomly simulates thousands of possible values for a variety of economic and financial variables over a series of selected timeframes
- Does not predict a path the economy will follow but instead produces a collection of possible paths including some that have not yet been observed
- Variables simulated include interest rates, stock market returns, bond defaults and real estate price movements



# Model Changes



- **New Metric – VaR (Value at Risk)**



VaR does not tell us about what's in the tail so we need to look at more than one VaR

# Model Changes



- Net Required Capital Using Value at Risk (VaR) metric
  - VaR levels: 95.0, 99.0, 99.5, 99.6
- New Calculation of BCAR
  - Formula change
  - Difference between Available Capital and Required Capital, as a ratio to Available Capital
    - Required Capital calculated using VAR metrics
  - Better alignment with risk appetite/tolerance statements



# New Structure – LH BCAR



**BCAR Ratio = (Available Capital – Net Required Capital) / Available Capital**



## Available Capital (AC)

Reported Capital (PHS)

Equity Adjustments:

AVR Reserves

Interest Maintenance Reserve

Unearned Premiums

Debt Adjustments:

Surplus Notes

Other Adjustments:

Future Operating Losses

Future Dividends

Derivatives Off Balance Sheet

## Net Required Capital

Gross Required Capital (GRC):

(C1) Asset Risk

(C2) Insurance Risk

(C3) Interest Rate/Market Risk

(C4) Business Risk

Covariance Adjustment

Net Required Capital (NRC)\*

$$\begin{aligned} * \text{NRC} = & \text{SQRT} [ (C1_{\text{NonEq}} + C3_{\text{interest}})^2 + (C1_{\text{Eq}} + C3_{\text{market}})^2 + (C2)^2 ] \\ & + C4 \end{aligned}$$

# Example of Impact to LH Score



## Current LH BCAR Calculation (ratio to NRC)

APHS = \$150M

NRC = \$100M

$$\text{BCAR} = 150 / 100 = 150.0$$

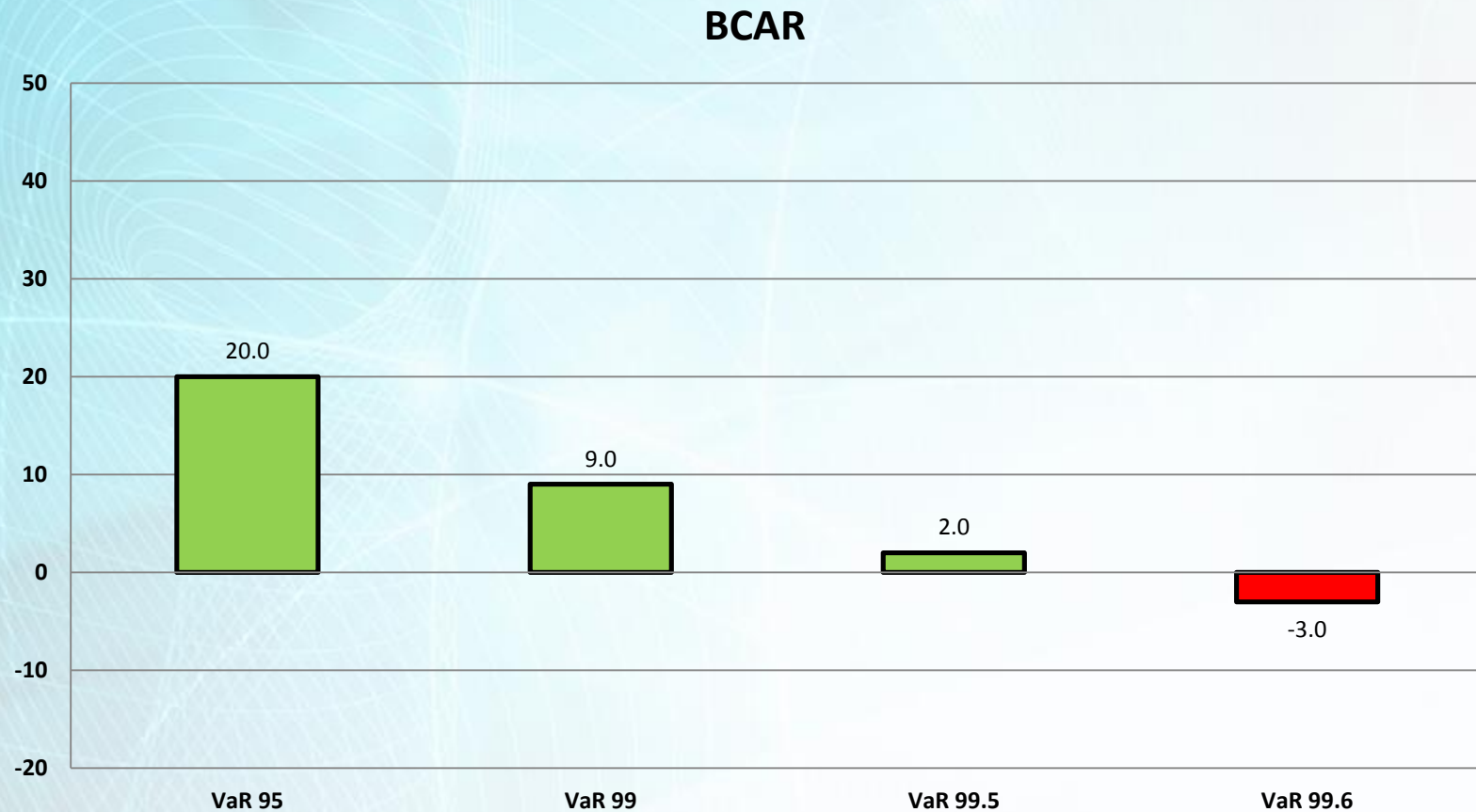
## Planned LH BCAR Calculation (ratio to Available Capital)

Available Capital = \$150M

NRC = \$100M

$$\text{BCAR} = (150 - 100) / 150 = 50/150 = 33.3$$

# Display of BCAR Scores



# Investment Risk



- Fixed Income Securities – Default Risk
  - Bonds
  - Preferred Stocks
  - Mortgage Loans
  
- Equities – Market Value Volatility
  - Publicly Traded Common Stocks
  - Real Estate
  - Schedule BA assets

- Bonds – Default Risk
  - Based on ESG
  - Update ***bond default*** risk factors
    - ✓ Reflect maturity of company's bond portfolio (SRQ)
    - ✓ Reflect asset quality of company's bond portfolio (SRQ)
    - ✓ Only defaults occurring in first 10 years are considered
    - ✓ Offset default with recovery on defaults (vary by rating)
    - ✓ Net defaulted amounts are present valued

# Investment Risk



## ○ LH Distribution-Bond Quality/Maturity

<u>using L/H industry allocation</u>						
	Bond Maturity					
	<u>m&lt;1yr</u>	<u>1yr&lt;m&lt;3</u>	<u>3yr&lt;m&lt;5</u>	<u>5yr&lt;m&lt;10</u>	<u>10yr&lt;m&lt;20</u>	<u>20yr&lt;m</u>
AAA	3.1%	3.1%	2.8%	4.8%	4.4%	6.0%
AA+	0.4%	0.7%	0.9%	1.6%	2.0%	1.5%
AA	0.7%	0.9%	0.8%	2.4%	2.2%	2.1%
AA-	0.4%	0.7%	0.8%	2.4%	1.8%	1.9%
A+	0.7%	1.1%	1.5%	2.9%	2.3%	2.5%
A	1.2%	2.3%	3.2%	7.2%	3.0%	5.5%
A-	0.9%	2.0%	2.7%	5.6%	2.7%	4.3%
BBB+	1.7%	4.1%	4.5%	11.0%	4.8%	6.3%
BBB	2.5%	5.6%	6.5%	20.0%	6.0%	7.2%
BBB-	0.7%	2.0%	3.0%	9.0%	2.6%	2.5%
						Avg Maturity for:
						<u>naic 1</u>
						11.5
						<u>naic 2</u>
						9.8

Avg Quality for:
<u>naic 1</u>
AA-/A+



# Investment Risk



- Preferred Stocks – Default Risk
  - Based on bond defaults from ESG
  - Update ***preferred stock default*** risk factors
    - ✓ Assumes debt like features
    - ✓ Assumes ability and willingness to hold to maturity
    - ✓ Uses industry bond distribution risk factors

# Investment Risk



- Mortgage Loans – Default Risk
  - Based on NAIC RBC study of commercial mortgage loans
    - ✓ RBC study produced factors at VaR 92 level for various classes
    - ✓ Used real estate tail to get to factors for higher confidence levels
  - Update ***Mortgage Loans*** risk factors
    - ✓ Reviewed NAIC RBC factors for CM1 thru CM5
    - ✓ 98% of commercial mortgages held by Life insurers were CM3 or better

# Investment Risk



- Spread-of-Risk (SOR) factor based on same scale used for PC companies
  - SOR applied to fixed income asset risk charges
  - SOR factor = Factors range from 1.5 to 0
  - SOR factor = 0 when invested assets exceed \$500m

# Investment Risk



- Common Stocks – Market Value Volatility
  - Based on ESG
  - Update publicly traded **common stock** risk factors
    - ✓ Reflect volatility of stock market (stochastic portion – S&P 500)
    - ✓ Reflect type of stocks held by company (SRQ – Beta)
    - ✓ Credibility of company Beta based on degree of fit (R-squared)
    - ✓ Using 1 year time period

	LH	Industry Baseline Risk Factors			
	Current <u>BCAR</u>	<u>VaR 95</u>	<u>VaR 99</u>	<u>VaR 99.5</u>	<u>VaR 99.6</u>
Publicly Traded Common Stock	30.0%	25.0%	38.0%	43.0%	44.0%

# Investment Risk



## ○ Real Estate – Market Value Volatility

- Based on ESG
- Update ***Real Estate*** risk factors
  - ✓ Uses real estate index in ESG
  - ✓ Use same factors for Company Occupied and Investment real estate
  - ✓ Using 1 year time period

	LH	Industry Baseline Risk Factors			
	Current BCAR	<u>VaR 95</u>	<u>VaR 99</u>	<u>VaR 99.5</u>	<u>VaR 99.6</u>
Company Occupied Real Estate	10.0%	12.0%	17.5%	19.5%	20.2%
Investment Real Estate	15.0%	12.0%	17.5%	19.5%	20.2%



# Investment Risk



- Schedule BA Assets
  - Fixed Income (Bonds, Preferred Stock, Mortgage Loans):
    - ✓ Bonds, Preferred Stock risk charges based on ESG defaults
    - ✓ Based on reported NAIC Class from AVR (non-AVR companies assume Class 4 factors)
    - ✓ Risk charge assumes most conservative rating/maturity within NAIC class (a-/10 yr Class1)
    - ✓ Risk charges may be adjusted if more detail provided



# Investment Risk



- Schedule BA Assets
  - Equity, Real Estate, Other
    - ✓ BA Equity baseline risk factors based on ESG indices using 1 year volatility metric (Affiliated Equity risk charge-100%)
    - ✓ BA Real Estate risk charge based on ESG property equity index (1 year volatility metric)
    - ✓ Companies can share greater details of portfolio for potential reduction in factors

# Investment Risk



## ○ Schedule BA Assets

- *Other Invested Assets (BA and DA)* risk factors
  - ✓ Reviewed volatility in over 30 different hedge fund indices in ESG
  - ✓ Selected baseline risk factors = 1.10 times S&P 500 factors
  - ✓ Companies can share greater details of portfolio for potential reduction in factors
  - ✓ Using 1 year time period

	LH Current <u>BCAR</u>	Industry Baseline Risk Factors			
		<u>VaR 95</u>	<u>VaR 99</u>	<u>VaR 99.5</u>	<u>VaR 99.6</u>
Other Invested Assets (Unaffiliated)	various	27.5%	41.8%	47.3%	48.4%

# Investment Risk



- Reinsurance Recoverables, Reserves Ceded
  - Life reinsurance market concentrated in highly rated reinsurers
  - Counterparty risk charges based on 'aa' rated reinsurer impairment rate assuming 50% recovery rate and 5 year payout period
  - Additional risk charges apply if reinsurance leverage exceeds 500% (same as current model)

# Investment Risk



## ○ Derivatives

- Risk charges based on NAIC class as reported in AVR schedule using ESG based default rates
- Risk charges higher than bonds for similar NAIC classifications
- High Risk CMO's same as Class 3 derivatives
  - May be adjusted if additional information provided

# Investment Risk



- Other Invested Assets

- 10% baseline risk charge applied to most other invested assets, including write-ins
- 5% risk charge applied to COLI write-in assets
  - May be adjusted based on rating of carrier
  - COLI assets held in separate accounts may be reviewed for equity-like charges



# Mortality Risk



- Mortality risk factors applied to sum at risk (face amount) less reserves, net of reinsurance
- Factors determined by line of business (individual life, group life)
- Factors determined for four net amount at risk bands (similar to previous model)
- Recent SOA mortality study used to build gender, age, smoking class population (individual, group/credit)
- Internal simulation performed using 10,000 scenarios
- Statement data used to determine average policy size within each of four net at risk bands
- Number of policies in each band is key driver (fewer policies implies higher mortality risk)



# Mortality Risk



<b>Industrial/Ordinary Life Insurance</b>					
<b>Net Amount at Risk</b>	<b>VAR 95</b>	<b>VAR 99</b>	<b>VAR 99.5</b>	<b>VAR 99.6</b>	
<b>0-500 Million</b>	0.0022	0.0034	0.0036	0.0037	
<b>500 Million-5 Billion</b>	0.0009	0.0014	0.0015	0.0016	
<b>5 Billion-25 billion</b>	0.0005	0.0008	0.0009	0.0011	
<b>&gt; 25 Billion</b>	0.0002	0.0005	0.0005	0.0006	
<b>Group/Credit Life Insurance</b>					
<b>Net Amount at Risk</b>	<b>VAR 95</b>	<b>VAR 99</b>	<b>VAR 99.5</b>	<b>VAR 99.6</b>	
<b>0-500 Million</b>	0.0021	0.0029	0.0030	0.0031	
<b>500 Million-5 Billion</b>	0.0003	0.0005	0.0008	0.0009	
<b>5 Billion-25 billion</b>	0.0002	0.0004	0.0005	0.0006	
<b>&gt; 25 Billion</b>	0.0001	0.0002	0.0003	0.0004	

# Morbidity Risk



- Short-Tailed Lines of Business-Premium based
  - Profitability analyzed over 10 year period
  - Loss curve built for each line of business and for each of four size categories: very small, small, medium, large (industry curves)
  - Industry factors (determined for each VaR level) will be adjusted for each company's profitability over a 3 year period
    - Initial testing assumes companies get industry profitability factors
  - After line of business factors determined, correlation matrix applied to reflect diversification

# Morbidity Risk



- Long-Tailed Lines of Business (LTC,LTD)-Premium based
  - Long-Term Care
    - External models developed using industry level experience from business priced in early 2000's
    - Risk factors determined by reviewing profitability of run-off block 15+ years forward (statutory losses emerge around this period and going forward)
    - Factors based on amounts needed to cover present value of future losses, adjusted for assumed target surplus held
    - Factors do not vary by premium size (assumes industry wide trends)
    - Group LTC factors assumed to be lower than individual
    - New business with current pricing assumptions may be reviewed for adjustments to risk factors

# Morbidity Risk



- Long-Tailed Lines of Business (LTC,LTD)-Premium based
  - Long Term Disability
    - Inforce population developed based on industry data
    - Population includes age, gender, disability coverage period (benefit period to age 65 and lifetime)
    - Disability incidence simulated for 10,000 scenarios using internal simulation model (similar to mortality risk modeling)
    - Factors determined based on amounts needed to cover future disability claims relative to cumulative premiums for each VaR level
    - For most cells, claims exceed premiums around 15 years from model start date
    - Factors do not vary by size as disability incidence rates do not show much volatility
    - Baseline factors set higher for non-cancellable, lower for other IDI and group DI
    - Group Short-Term disability modeled as short-tail lines of business



# Morbidity Risk



## ○ Reserve Based

- Reserve adequacy (reserves held relative to claims incurred) analyzed over 10 year period
- Loss curve built for each reserve category in annual statements and for each of four size categories: very small, small, medium, large (industry curves)
- Industry factors (determined for each VaR level) will be adjusted for each company's reserve adequacy over a 3 year period
  - Initial testing assumes companies get industry reserve adequacy factors
- After line of business factors determined, correlation matrix applied to reflect diversification

# Interest Rate Risk



- Interest Rate Movements
  - External models developed using industry representative assumptions
  - Discounted cash flow approach using 1,000 scenario subset (from 10,000 ESG scenarios) over 30 year period
  - Key Annuity risk drivers
    - ✓ Surrender Charge protection
      - At issue, 3 years into surrender charge period and no surrender charge factors developed
    - ✓ With and Without Market Value adjustments
    - ✓ Payout period (SPIA, Structured Settlements, Other)
    - ✓ Factors developed for matched portfolios, +1/-1 year mismatched portfolios (asset duration one year longer than liabilities, one year shorter than liabilities)
    - ✓ Structured settlement factors developed for matched portfolio, assets shorter than liabilities by one year, assets shorter than liabilities by 2 years



# Market Risk



- Equity/Interest Rate Movements
  - Variable Annuity risks based on C-3 Phase 2 determination
  - VAR levels from CTE component used to determine required capital (adjusted for reserves)
  - Based on company provided information
  - Default factors will be used in absence of company information
  - Level of required capital based on richness of guaranteed benefits provided on VA's

# Business Risk



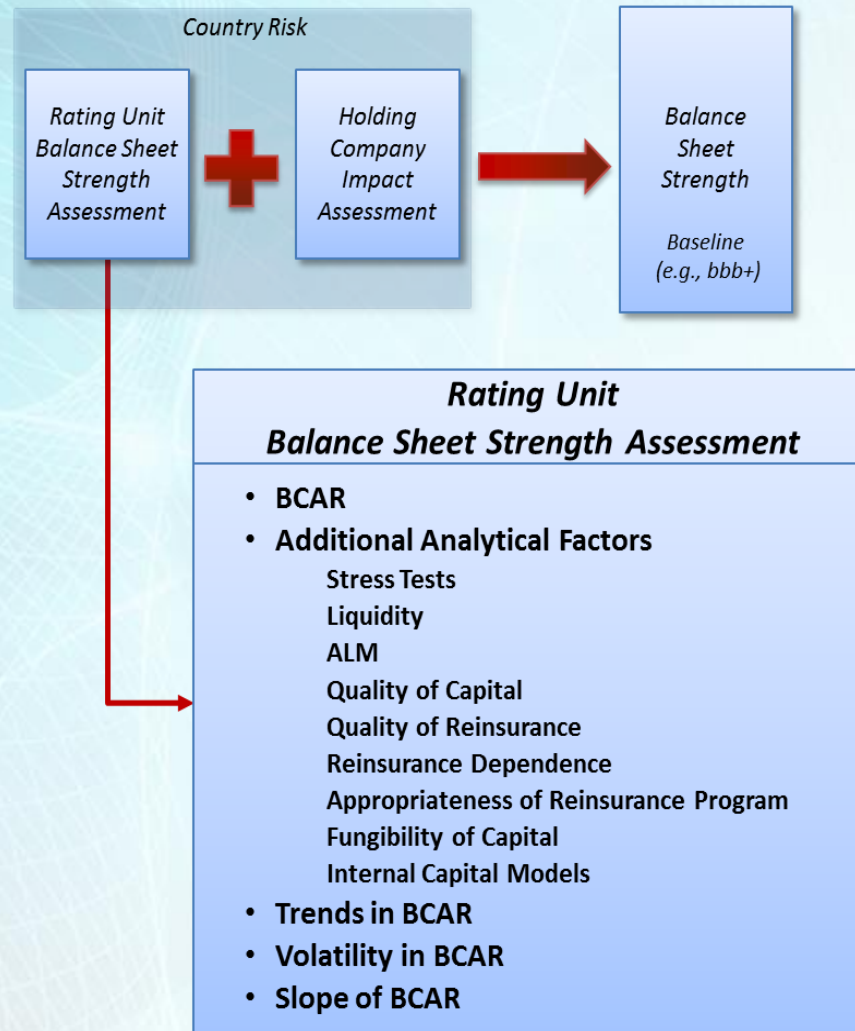
- Risks not reflected in balance sheet that may affect surplus
  - Direct Written Premiums (net of variable)
  - Contingent Liabilities
  - Non-controlled assets
  - Unfunded Pension & other post employment/retirement benefits
  - Separate Account Assets
- Use same required capital at all VaRs

# Application of BCAR

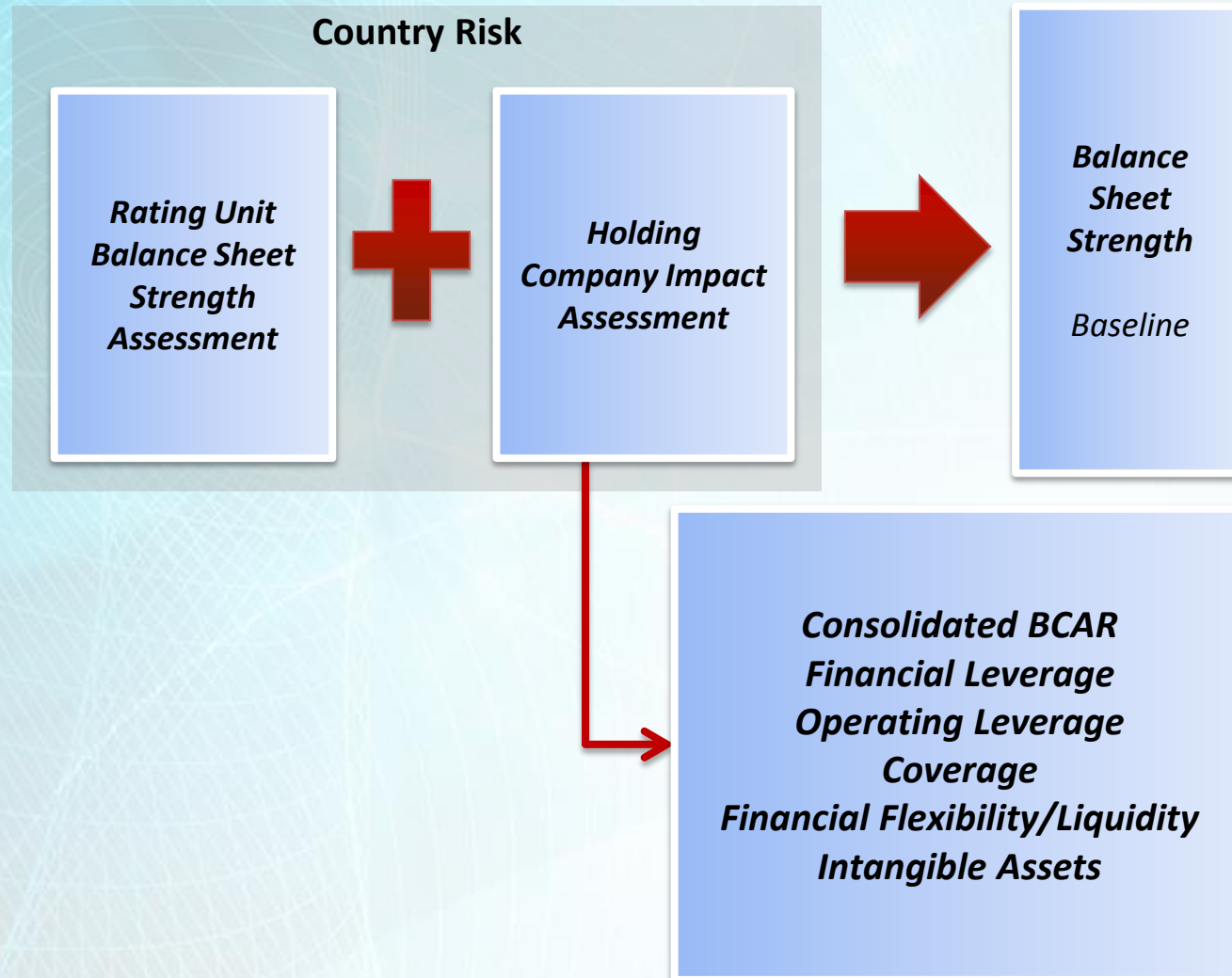


VaR Confidence Level (%)	BCAR	BCAR Assessment
99.6	$> 25$ at 99.6	Strongest
99.6	$> 10$ at 99.6 & $\leq 25$ at 99.6	Very Strong
99.5	$> 0$ at 99.5 & $\leq 10$ at 99.6	Strong
99	$> 0$ at 99 & $\leq 0$ at 99.5	Adequate
95	$> 0$ at 95 & $\leq 0$ at 99	Weak
95	$\leq 0$ at 95	Very Weak

# Applying BCAR Scores



# Holding Company Impact Assessment





# Balance Sheet Strength Assessment



## Combined Balance Sheet Strength Assessment (Lead Rating Unit & Holding Company)

		<u>Holding Company</u>			
		Positive	Neutral	Negative	Very Negative
<u>Lead Rating Unit</u>	Strongest	Strongest	Strongest	Very Strong	Adequate
	Very Strong	Strongest	Very Strong	Strong	Weak
	Strong	Very Strong	Strong	Adequate	Very Weak
	Adequate	Strong	Adequate	Weak	Very Weak
	Weak	Adequate	Weak	Very Weak	Very Weak
	Very Weak	Weak	Very Weak	Very Weak	Very Weak

# Balance Sheet Strength Assessment



## Overall Balance Sheet Strength Assessment

Combined Balance Sheet Assessment  
(Rating Unit/ Holding Company)

Country Risk Tier					
	CRT-1	CRT-2	CRT-3	CRT-4	CRT-5
<b>Strongest</b>	a+/a	a+/a	a/a-	a-/bbb+	bbb+/bbb
<b>Very Strong</b>	a/a-	a/a-	a-/bbb+	bbb+/bbb	bbb/bbb-
<b>Strong</b>	a-/bbb+	a-/bbb+	bbb+/bbb/bbb-	bbb/bbb-/bb+	bbb-/bb+/bb
<b>Adequate</b>	bbb+/bbb/bbb-	bbb+/bbb/bbb-	bbb-/bb+/bb	bb+/bb/bb-	bb-/b+/b
<b>Weak</b>	bb+/bb/bb-	bb+/bb/bb-	bb-/b+/b	b+/b/b-	b/b-/ccc+
<b>Very Weak</b>	b+ and below	b+ and below	b- and below	ccc+ and below	ccc and below

# The Building Block Approach



- The building blocks themselves will remain the same
- Components of the building blocks are currently out for comment

## A.M. Best's Rating Process



# Thank You!



## Comments & Responses to Briefing

Send email to:  
[methodology.commentary@ambest.com](mailto:methodology.commentary@ambest.com)

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