

An Updated BCRM



- Not a fundamental change to rating analysis
- Key rating drivers will remain the same
 - Balance Sheet Strength
 - Operating Performance
 - Business ProfileEnterprise Risk
 - Management

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An Updated BCRM: Building Blocks



An Updated BCRM: Building Blocks



Balance Sheet Strength

- Rating unit balance sheet strength assessment
 BCAR
 - Other qualitative and quantitative factors
- Holding company impact assessment
- Country risk impact



Rating Unit Balance Sheet Strength Assessment





What is BCAR?

Best's Capital Adequacy Ratio (BCAR)

- A comprehensive quantitative tool that evaluates many of the risks to the balance sheet simultaneously
- Generates an overall estimate of the required level of capital to support those risks and compares it with available capital

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BCAR and the Building Blocks



Model Changes

New Metric
Calculation of BCAR Score
How Many BCAR Scores & What VaR Levels
Overview of Available Capital & Risk Categories
Treatment of Natural Catastrophe PMLs
Stochastic-based
What-if Testing
BCAR Guidelines
(1837)

New Metric



BCAR Scores and VaR Levels

Using Value at Risk (VaR) metric VaR levels: 95, 99, 99.5, 99.6

Return Period (Years)	Annual Probability (%)	Confidence Level (%)
20	5.0	95.0
100	1.0	99.0
200	0.5	99.5
250	0.4	99.6

VaR 99.8 also modeled but not included in balance sheet assessment VaR 99.8 included in ERM assessment

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Overview of Available Capital & Risk Categories

Available Capital (AC)	Net Required Capital
exported Capital (PHS) quity Adjustments: [DAC] Assets Loss Reserves Reinsunces Reinsunces Debt Service Requirements Debt Service Requirements Debt Service Requirements Ther Adjustments: Future Operating Losses Goodwill & Intangible Assets Other	Gross Required Capital (GRC): (B1) Twad income Securities (B2) Equity Securities (B3) Interest Rate (B4) Credit (B4) Credit (B4) Credit (B4) Pathermium Witten (B7) Business Risk (B4) Potential CatastropheLoss Covariance Adjustment Net Required Capital (NRC)*
aquired Capital = $\sqrt{(B1)^2 + (B2)^2 + (B3)^2 + }$	(.5 * B4) ² + [(.5 * B4) + (B5)] ² + (B6) ² + (B8) ²)

Stochastic-based BCAR



Stochastic-based BCAR Advantages

- Only need to run simulations at industry level
- Only need to run those simulations once per year
- Manual selection at industry level
- Allows for review of current market/macroeconomic environment
- Limits volatility in industry level factors from year to year
 Changes in ESG to be smoothed in over multiple years
- · Allows for WHAT-IF testing

What-If Testing



- Changing mix of bonds by rating and maturity
- Changing mix or volatility of common stocks
- Changing mix of reinsurance recoverables by reinsurers' ratings and duration
- Changing mix of net loss & LAE reserves by LOB
- Changing mix of NPW by LOB
- Can be done without re-running any simulations

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Treatment of Risks in PC BCAR

Investment Risks



Investment Risks - Bonds

Bonds – Default Risk

- Based on ESG
- Updated *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

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Investment Risks - Common Stocks

<u>Common Stocks – Market Value Volatility</u>

- Based on ESG
- Updated publicly traded *common stock* risk factors
 Reflect volatility of stock market (stochastic portion) uses 1yr time horizon
 - Can adjust to reflect volatility of company's portfolio (Beta)
 - · Credibility of company Beta based on degree of fit (R-squared)
 - Adjusted Beta= (Co. Beta * Co. Rsquared) + (1.0 * (1.0 Co. Rsquared))

Industry Baseline Risk Factors (YE 2015)								
Publicly Traded Common Stock	VaR 95	VaR 99	VaR 99.5	VaR 99.6	VaR 99.8			
United States	25.0%	38.0%	43.0%	44.0%	48.0%			
Canada	27.0%	41.0%	46.0%	47.0%	50.0%			
United Kingdom	26.0%	39.0%	45.0%	46.0%	51.0%			
Japan	29.0%	43.0%	48.0%	49.0%	54.0%			
Other	25.0%	39.0%	45.0%	46.0%	51.0%			

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Investment Risks – Other Asset Classes

<u>Hedge Funds – Market Value Volatility</u>

- Update Other Invested Assets risk factors
 - Reviewed volatility in over 30 different hedge fund indices in ESG
 - Selected baseline risk factors = 1.10 times common stock risk factors
 Companies can share greater details of portfolio for potential reduction in factors (investment working group)
 - Using 1 year time period

Industry Baseline Risk Factors (YE 2015)						
	PC Current BCAR	VaR 95	VaR 99	VaR 99.5	VaR 99.6	VaR 99.8
Other Invested Assets (Unaffiliated)	20.0%	27.5%	41.8%	47.3%	48.4%	52.8%

Interest Rate Risk

Interest Rate Risk

- Risk of having to sell fixed income assets when market values are lower
- Exposure to a rise in interest rates over next one year
- Liquidity risk during the upcoming year
- Risk is driven by sudden shock event
- Non-Life Usually natural catastrophe, or manmade, could be economic
- Life economic/human behavior

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Interest Rate Risk

- Interest Rate Movements
 - Based on ESG
 - Simulated 10,000 potential one year changes in interest rates
 - Reflects duration of company's fixed income asset portfolio
 - Reflects liquidity need using Greater of 10% of liquid assets or estimated shock loss
 - for cat exposed = 1-in-100 Gross PML All Perils Per Occurrence
 - Shock loss kept constant across all Vars but Interest rates rise

Proposed One Year Rise in Interest Rate					
VaR 99.	VaR 99.6	VaR 99.5	VaR 99	VaR 95	Current
290 B	280 BP	270 BP	240 BP	170 BP	120 BP

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Credit Risk-Reins Recoverables

- Created credit risk factors by ICR and year recov to be collected, for each confidence level (5 tables)
- Ran simulations of impairments for a portfolio of 20 reinsurers for each ICR at year 1, year 5 and year 10
 - Use AMBest insurer cumulative impairment rates for each reinsurer in portfolio
 - Indicated factors are net of 50% recov and PV'd
 - Does not reflect concentration risk
 - Concentration risk addressed in Balance Sheet Strength analysis, not in BCAR
- Recoverables allocated by year for each ICR
- Multiply recovs by rating and year against impairment tables of factors

Reserve Risk

- Risk of <u>unanticipated</u> adverse development on net loss & loss-adjustment expense (LAE) reserves
- <u>Reserve Risk Factors</u>
 - Created 4 probability curves of potential reserve development for each line of business – based on size of reserve
 - Industry baseline factors correspond to the confidence levels on the curves
 - Company size of reserve determines industry baseline factors for that line of business
 - Adjust industry factors for company volatility/stability to get company specific factors
- Adjustment to required capital for Excessive Growth remains

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Reserve Risk



Premium Risk

- Risk that pricing of business written next year will be inadequate
 Potential for Underwriting Loss on one more year's worth of business
 - This is the one-year look forward in terms of adding additional exposure
 - Current year's NWP used as proxy for next year
- Premium Risk Factors
 - Created 4 probability curves of potential UW profit/loss for each line of business – based on size of NPW
 - Industry baseline factors correspond to the confidence levels on the curves
 Company size of NPW determines industry baseline factors for that line of business
 - business
 Adjust industry factors for company profitability to get company specific factors
- Adjustment to required capital for Excessive Growth remains

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Premium Risk – Non-Life





Reserve & Premium Diversification

New calculation for line of business diversification uses correlati	on matrices
$Diversification \ Factor = SQRT\{ [w_1\sigma_1 \dots w_n\sigma_n] \times \begin{bmatrix} 1 & \cdots \\ \vdots & \ddots \\ \rho_{n1} & \cdots \\ \end{bmatrix}$	$ \begin{bmatrix} \rho_{1n} \\ \vdots \\ 1 \end{bmatrix} \times \begin{bmatrix} w_1 \sigma_1 \\ \vdots \\ w_n \sigma_n \end{bmatrix} \} $
Divided by	
$SUM[w_1\sigma_1\dots w_n\sigma_n]$	
Where weights (w) are % of total business in that line and the σ are the company risk factors by line	
Correlation matrices vary by size of company's total NPW or total Reserves	\sim
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Catastrophe Risk

Update natural catastrophe	approach
Total all perils	
Per Occurrence	
Net of reinsurance only	
Includes reinstatement premium	
Pre-Tax	
Measured at various VaR levels	
Included as Net Required Capital component	
Assumed to be independent of other risk catego	ries

BCAR Guidelines

BCAR is the starting point in the assessment of <u>balance sheet strength</u>					
VaR Level (%)	BCAR	BCAR Assessment			
99.6	> 25 at 99.6	Strongest			
99.6	> 10 at 99.6 & ≤ 25 at 99.6	Very Strong			
99.5	> 0 at 99.5 & ≤ 10 at 99.6	Strong			
99	> 0 at 99 & \leq 0 at 99.5	Adequate			
95	> 0 at 95 & ≤ 0 at 99	Weak			
95	≤ 0 at 95	Very Weak			
* Companies with < 20 million USD in capital & surplus cannot score in strongest category					
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BCAR and the Balance Sheet Assessment





Loss Scenarios & Stress Tests





Catastrophe Risk and the Rating Process

- Balance Sheet Strength
 - Does the company have the financial wherewithal to absorb potential losses?
- ERM
 - Is the company effectively managing its catastrophe risk through stress testing?



ERM

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- Onus is on management to
- Be acutely aware of issues specific to the company's individual geographic exposures
 Be able to properly manage those risks with accurate data
- Analytical focus is on data quality and the tools used to manage exposure
- Model output should be based on near-term/warm sea-surface temperature event set
- Loss estimate should include:
 - Demand surgeStorm surge

 - Fire following earthquakes
 Secondary uncertainty

 - Loss-adjustment expenses
 Additional living expenses
- Question to companies: As opposed to other outputs, why does selected output best capture the company's catastrophe exposure?

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Balance Sheet Strength

Catastrophe PML is used in both standard and stress BCAR

Standard BCAR Stress BCAR

Stress BCAR: Calculation



Stress BCAR Interpretation with Financial Flexibility







Stress BCAR Interpretation no Financial Flexibility



Terrorism Risk and the Rating Process

- · Balance Sheet Strength
 - A.M. Best's assessment of an insurer's balance sheet strength in light of its terrorism exposure

 - Standard BCAR
 - Stress BCAR
 - Treatment for primary insurers vs. professional reinsurers
- ERM
 - How insurers manage their terrorism risk



BCAR: How to Calculate the Terrorism PML

· A.M. Best has three tiers that reflect the level of perceived risk of attack for U.S. cities



BCAR: How to Calculate the Terrorism PML

- 1. A.M. Best assumes a 10% annual probability of a large scale attack
- 2. A.M. Best assigns these tiers conditional probabilities nal Probability Tier Cor



3. These conditional probabilities are converted to annual probabilities: Annual Probabilities for Tiers = 10% Annual Probability × Conditional Probability of Each Tier



BCAR: How to Calculate the Terrorism PML

- 4. A.M. Best multiplies the annual probability by the number of exposures greater than 10% of surplus (net of reinsurance and TRIPRA) for each tier
- The probability (adjusted for the number and location of exposures) calculated for each tier is then multiplied by the largest exposure (net of reinsurance and TRIPRA) in each tier to arrive at three terrorism risk amounts
- 6. The largest of these three is the terrorism PML
- How the terrorism PML is calculated has not changed. Where/how it is used in the BCAR has.

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Stress BCAR: Calculation



Stress BCAR: Interpretation

 As part of the stress test, companies are subject to three concentration checks

Countrywide Concentrations	Tier 1 + Tier 2 Concentrations	Tier 1 Only
Fewer than 10 Areas of	Fewer than 6 Areas of	Fewer than 3 Areas of
Concentrated Pre-Tax Net	Concentrated Pre-Tax Net	Concentrated Pre-Tax Net
Losses Greater	Losses Greater	Losses Greater
than 20% of PHS	than 20% of PHS	than 20% of PHS

 Companies must pass all three checks in order to get stress BCAR tolerance

Stress BCAR: Interpretation

· Tolerance assumes insurer has financial flexibility

asses All Concentration Checks			
Yes	Strongest	> 0 at 99.5	= Strongest
Yes	Very Strong > 10 at 68.0 & ± 25 at 69.0	> 0 at 99	= Very Strong
Yes	Strong > 0 at 98.5 & = 10 at 98.6	> 0 at 95	= Strong
Yes	Adequate > 0 at 99 & ± 0 at 99.5	> 0 at 95	= Adequate
Yes	Adequate > 0 at 99 & ± 0 at 99.5	± 0 at 95	= Weak
Yes	Weak	≤ 0 at 95	= Very Weak

Stress BCAR: Passing Example





Stress BCAR: Interpretation



Stress BCAR: Failing Example





BCAR is NOT the Sole Determinant of Balance Sheet Strength



- BCAR is just one of many factors considered in assessing Balance Sheet Strength
- BCAR measures risk-adjusted capital at a point in time ... but does not explain why it is at that level or how it may change in the future
- A complete assessment of Balance Sheet Strength
 involves understanding the drivers of risk-adjusted capital

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Analytical Factors- Quantitative





Analytical Factors- Qualitative





Reinsurance Factors

😳 Favorable	Less Favorable
 Higher rated reinsurers 	Low or unrated reinsurers
 Diversified program 	Concentration
High-quality, accessible collateral	 Complex collateral structure Substantial monitoring requirements
has benefits for both parties	Frequent changes in program
 Strategic use of reinsurance within well-defined risk appetite 	 Risk appetite changes to reflect reinsurance market changes
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Asset Quality

Higher	Lower
 Limited concentration 	 Concentration(s) of assets
 Asset liquidity matches potential cash needs Management capabilities match risk profile of assets 	 Mismatch between asset liquidity and potential cash needs Investment guidelines are
 Investment guidelines are clear and do not require frequent review 	complex and change oftenInvestments frequently "bump up" against guidelines
 Well-defined investment strategy 	 Management skills do not appear to match complexity of portfolio
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Reserve Quality

Higher	Lower
Favorable overall loss reserve development trend	Adverse trend in reserve development
 Stable approach to establishing reserves for claims 	 Recent review of claims reserve practices led to a significant reserve action
 Clear relationship between reserve selections and actuary range 	 Management's reserve selections differ materially from opining actuary's selections

Economic Capital / ALM







Holding Company Balance Sheet Strength Assessment





Baseline Rating from Balance Sheet Strength

Country Risk Tier						
ŧ		CRT-1	CRT-2	CRT-3	CRT-4	CRT-5
ssme Iny)	Strongest	a+/a	a+/a	a/a-	a-/bbb+	bbb+/bbb
et Asse: Compa	Very Strong	a/a-	a/a-	a-/bbb+	bbb+/bbb	bbb/bbb-
ice She Holding	Strong	a-/bbb+	a-/bbb+	bbb+/bbb/bbb-	bbb/bbb-/bb+	bbb-/bb+/bb
d Balan g Unit/l	Adequate	bbb+/bbb/bbb-	bbb+/bbb/bbb-	bbb-/bb+/bb	bb/bb-	bb/bb-/b+
tombine (Ratir	Weak	bb+/bb/bb-	bb+/bb/bb-	bb-/b+/b	b+/b/b-	b/b-/ccc+
	Very Weak	b+ and below	b+ and below	b- and below	ccc+ and below	ccc and below
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Operating Performance & Business Profile



Operating Performance

 Profitable insurance operations are essential for a rating unit to operate as a going concern. A.M. Best analysis focuses on:

Stability	Diversity	Sustainability	The interplay between earnings and liabilities retained by the rating unit
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In general, more diversity in earnings streams leads to greater stability in operating performance

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Operating Performance Assessment

Assessment	Notches	Key Characteristics
Very Strong	+2	Historical operating performance is exceptionally strong and consistent. Trends are positive and prospective operating performance is expected to be exceptionally strong. Volatility of key metrics is low.
Strong	+1	Historical operating performance is strong and consistent. Trends are neutral/slightly positive and prospective operating performance is expected to be strong. Volatility of key metrics is low to moderate.
Adequate	0	Historical operating performance and trends are neutral. Prospective operating performance is expected to be neutral. Volatility of key metrics is moderate.
Marginal	-1	Historical operating trends have been inconsistent. Trends are neutral/slightly negative with some uncertainty in prospective operating performance. Volatility of key metrics is moderate to high.
Weak	-2	Historical operating performance is poor. Trends are slightly negative and prospective operating performance is expected to be poor. Volatility of key metrics is high.
Very Weak	-3	Historical operating performance is very poor. Trends are negative and prospective operating performance is expected to be very poor. Volatility of key metrics is very high.

Components of Business Profile



Business Profile Assessment

Assessment	Adjustment (Notches)	Key Business Profile Characteristics
Very Favorable	+2	The company's market leadership position is unquestionable, demonstrated, and defensible within brand recognition. Distribution is seen as a competitive advantage; business lines are non-correlated and generally lower risk. Its management capabilities and data management are very strong.
Favorable	+1	The company is a market leader with strong business trends and good control over distribution. It has diversified operations in key markets that have high to moderate barriers to entry with low competition. It has a strong management team that is able to meet projections and utilize data effectively.
Neutral	0	The company is not a market leader, but is viewed as competitive in chosen markets. It has some concentration and/or limited control of distribution. It has moderate product risk but limited severify and frequency of loss. Its use of technology is evolving and its business spread of risk is adequate.
Limited	-1	The company has a lack of diversification in geographic and/or product lines; its control over distribution is limited and indifferentiated. I faces high/increasing competition with low barriers to entry and elevated product risk. Management is unable to utilize data effectively or consistently in business decisions.
Very Limited	-2	The company faces high competition and low barriers to entry. It has high concentration in commodity or higher-risk products with very limited geographic diversity. It has weak data management. Country risk may factor into its elevated business profile risks.
The key characteristics de	scribed for each asses	sment category are ideal scenarios and are not intended to be prescriptive.

Enterprise Risk Management (ERM)



ERM: Framework Evaluation

Risk Identification & Reporting
Risk Appetite & Tolerance
Stress Testing
Risk Management & Controls
Governance & Risk Culture

ERM: Risk Evaluation

Assessment of the rating unit's risk profile relative to its risk management capabilities

- Product/Underwriting
- Reserving
- Concentration
- Reinsurance
- Liquidity & Capital Management
- Investments
- Legislative/Regulatory/Judicial/Economic
- Operational

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ERM Assessment

Assessment	Notches	Key Characteristics
Very Strong	+1	The insurer's ERM framework is sophisticated, time/stress-tested and embedded across the enterprise. Risk management capabilities are superior and are suitable for the risk profile of the company.
Appropriate	0	The insurer's ERM framework is well-developed and/or adequate given the size and complexity of its operations. Risk management capabilities are very good and are well aligned with the risk profile of the company.
Marginal	-1	The insurer's ERM framework is developing; however, certain key elements of the framework are not yet in place or have proven inadequate given the complexity of its operations. Some risk management capabilities are not aligned with the risk profile of the company.
Weak	-2	The insurer's ERM framework is emerging and management is exploring the development of formal risk protocols. Risk management capabilities are insufficient given the risk profile of the company.
Very Weak	-3/4	There is limited evidence of a formal ERM framework in place. Severe deficiencies in risk management capabilities relative to the risk profile of the company are evident.

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Questions & Comments



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