GUY CARPENTER

INCON
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Risk Tolerances and ERM
Owning and Communicating Risk

November 13, 2017

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MARSH & McLENNAN COMPANIES

External Demands Are Raising the Stakes for Management to “Own” Risk

Increasing Demands for Executing Business Plans and Enhancing Performance With Effective ERM, Risk Tolerances, and Capital Modeling

Stakeholder & Employee Expectations	Regulator’s ORSA Requirements PHS > $500M	A.M. Best’s New Requirements	Competitive Peer Pressures	Board & Management Engagement
	NAIC Risk focused Exams	Best’s Credit Ratings Methodology Stochastic BCAR 2016 SRQ		

Insurers will need to further develop their ERM, internal capital modeling and risk tolerances capabilities in order to take “Ownership”.

Risk Appetite & Risk Tolerances
What are the Differences?

Risk Appetite

Definition:

The uncertainty a company is willing to assume given the reward corresponding with risk.

Example:

"As a mutual insurer, we take a long view in managing our risk. Our mission is to grow profitably through our independent agent channel while maintaining conservative financial strength to fulfill our current and future policyholder obligations.

Accordingly, we seek to **grow** and **preserve** our **capital** over a long-term time horizon by managing a proper balance of risk and reward. "

Risk Tolerance

Definition:

Quantified limits of a company's capacity for taking on risk measured at the enterprise, business unit, product, or individual risk level

Examples:

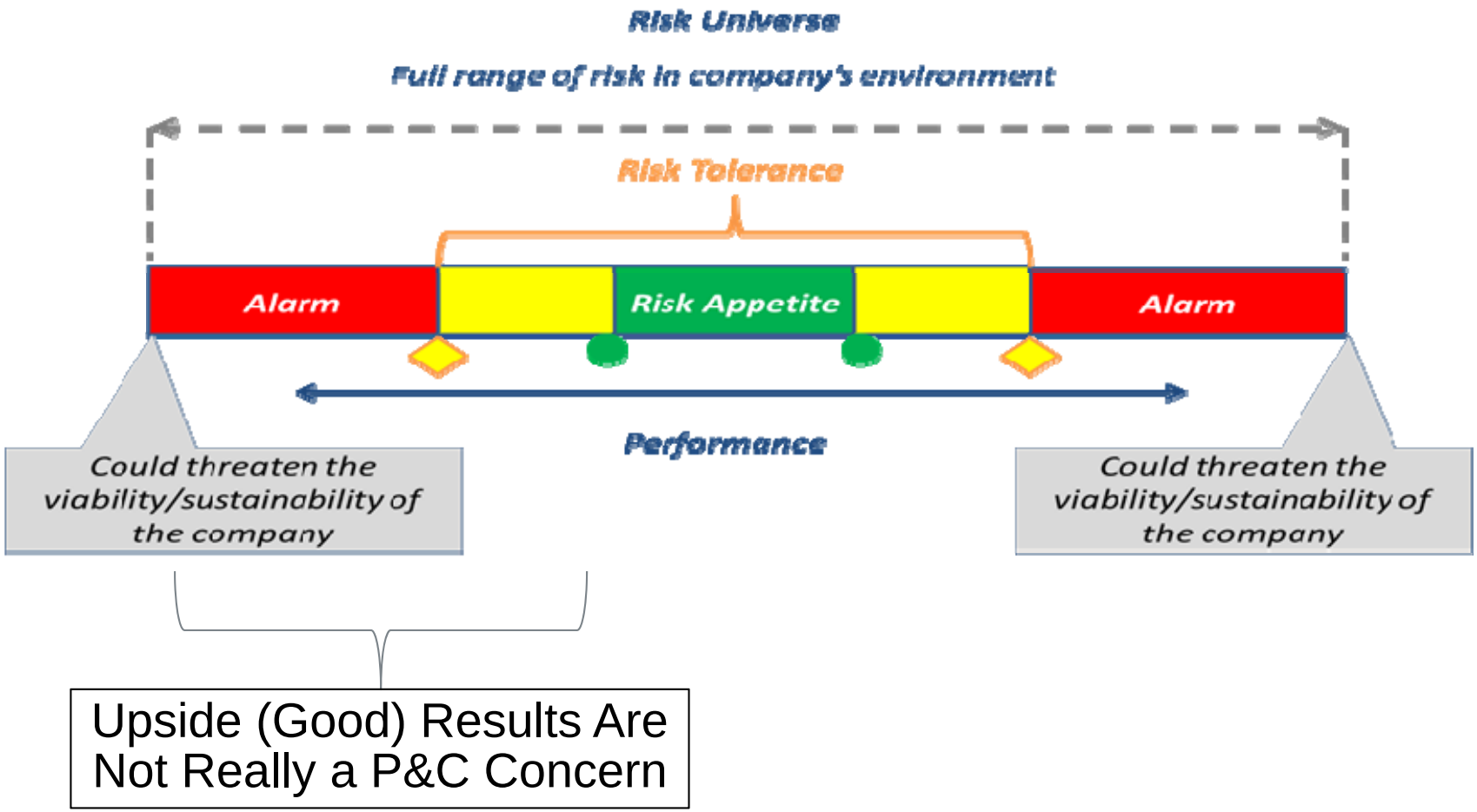
Capital Preservation: "There is no more than a 1% chance (1 in 100 years) of losing more than 20% of our surplus in one year"

Risk	Measure	Likelihood	Threshold	Time Horizon
Policyholder Security	Surplus Loss	<1% (1:100 yr)	>20% of PHS	1 Year

Capital Growth: "We will set our business plan so there is only a 20% chance (1 in 5 years) that the PHS growth will be less than 6% (e.g. our long-term PHS growth target)

Risk	Measure	Likelihood	Threshold	Time Horizon
Earnings Volatility	Surplus Growth	<20% (1:5 yr)	< 6% PHS Change	1 Year

Risk Appetite and Tolerance Framework
Theoretical Balanced Upside/Downside Example



Upside (Good) Results Are Not Really a P&C Concern

Risk Tolerance in an ERM Framework

A.M. Best's 2015 SRQ
Risk Tolerance Statements

Please state any overall risk appetite and risk tolerance statement(s) that have been established or approved by a Board or senior management that apply to the rating unit and provide guidance in providing policyholder security and creating stakeholder value. The risk appetite and risk tolerance statements may be a mix of qualitative and quantitative statements. If no such statements have been formally approved by a Board or senior management, please answer "None".

Background and Rating Implications

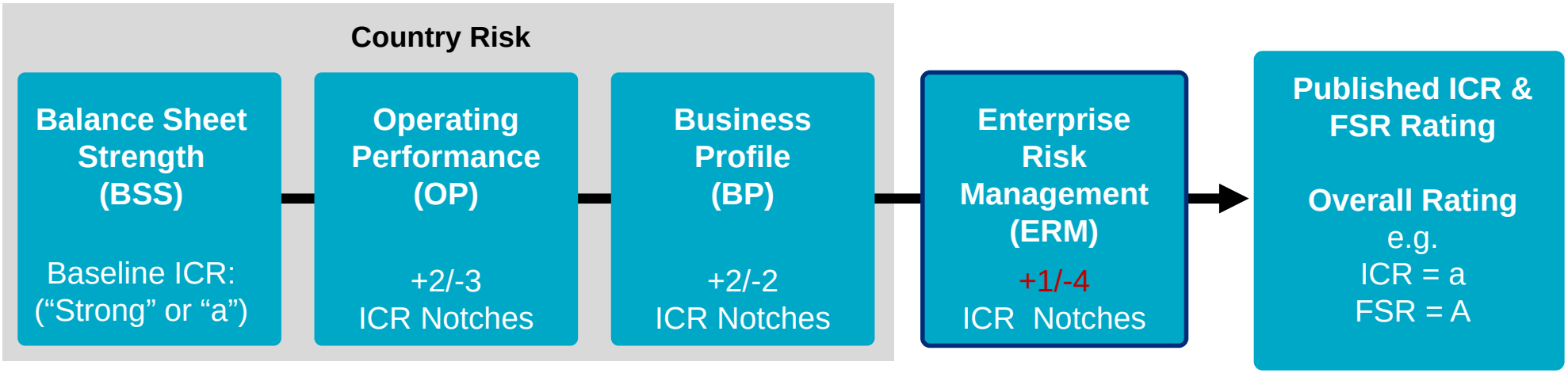
- A.M. Best still views many insurers' risk tolerance statements as weak/ inadequate, and is expecting companies to further develop, measure and embed their risk tolerances within their organizations.
- A.M. Best will continue to review company's risk tolerance statements more carefully to ensure they are:
  - Well-defined and measurable (e.g. deterministic or stochastic)
  - Approved by the Board and senior management
  - Monitored regularly
  - Used in strategic decisions
- A.M. Best views well-defined risk tolerance statements as integral to a company's ERM capability.
  - Analysts will be challenging insurers that don't have effective risk tolerance statements and may take a more conservative view in their ratings and capital evaluations
  - As A.M. Best reviews tolerance statements, they will increasingly be able to benchmark risk profiles and risk tolerances across the industry and peer groups
  - Over time, A.M. Best will review the effectiveness of a company's risk tolerance framework to ensure that its tolerance statements are aligned with business plans, financial projections, and risk-based decisions

A.M. Best's 2014 SRQ:
Risk Tolerance Statements (continued…)

- Tally of Responses to 2014 SRQ Risk Tolerance question:
  - 46% did not answer the SRQ question
  - 26% had inadequate responses to SRQ question
  - 28% had adequate responses to the SRQ question

Best's Credit Rating Methodology
A.M. Best's New Ratings Process

A.M. Best's new building block approach to the rating evaluation explicitly draws out the impact of ERM on the overall rating putting more emphasis on the need for companies to develop and validate risk appetite and risk tolerance statements



Key Assessment Areas by Core Rating Component

BSS
- BCAR assessment
- Other rating unit factors
- Holding company impacts
- Country risk impact

OP
- Historic results
- Trends
- Financial forecasts
- Volatility
- Country risk impact

BP
- Market position
- Distribution
- Management
- Pricing & data
- Product/ geographic concentration
- Country risk impact

ERM
- Risk culture/ governance
- Risk identification/ controls
- Risk measurement
- **Are ERM capabilities > company risk profile?**

Note: This illustration depicts the four core components for a Lead Rating Unit entity with no "Comprehensive Adjustment."

Source: Guy Carpenter & A.M. Best Rating Methodology

Risk Tolerance Questions

- How many risk tolerance statements do I need?
- What does a risk appetite statement look like (components)?
- How do I select a risk tolerance value?
- What risks need a risk tolerance statements?
- How do I organize my risk tolerance statements?
- How often should I change the metrics or values?
- How should I communicate my risk tolerance statements?
- Should I communicate all of my risk tolerance statements?
- Do all risk tolerance statements need to be probabilistic?
- How do I select the probability in a risk tolerance statement?
- Are there any risk tolerance standards I can follow?
- Why are risk tolerance statements so important?

Objectives and Considerations

The Value of Formalized Risk Tolerance Statements

We recognize three key values in risk tolerance statements. They:

> Provide **response policy** for difficult and unexpected situations
>
> **Focus risk management activities** into a forum for comparison
>
> **Communicate risk-aware culture** through all levels of the company

To provoke thought:

Should tolerances be set so that the chance of a breach is remote? Is the occasional breach, followed by appropriate and planned response, a healthier vehicle for risk management?

The more remote the metric, the more model error exists in its estimation.

Generalizations in Risk Tolerance Design
State of the Market

- There is still a **significant lack of standardization** in how companies define, apply, and enforce risk tolerance statements.

- We often find **redundancies** in the statements we are asked to review.

- Tolerance statements tend to be **weak on 'illness' (versus 'trauma') tolerances** which monitor exposure earnings threats.

- **Cat load** is an important concept that is being included in some risk tolerance statements, though in different ways.

Generalizations in Risk Tolerance Design
Limit Selection

- Two types of limits:

  Hard Limits: Those that trigger specific responses

  - Natural Peril PML
  - Financial strength ratings
  - Investment portfolio duration
  - Liquidity

  Soft Limits: Those that are reviewed and addressed strategically

  - Underwriting performance
  - Renewal retentions
  - Growth targets
  - Service targets

- The **Risk Tolerance Statement** details:
  - Frequency of tolerance measurement
  - Reporting requirements
  - Response plans for tolerance breach

Components of Risk Tolerance Statement

- **“Company X wants no more than a 10% probability of losing $5M of Surplus in any one year”.**
- Four components to the statement:
  - Metric: Surplus, Combined Ratio, Net Income, Equities, etc.
  - Number: Value like $5M or 10% of Surplus, etc.
  - Probability: Risk Tolerances are typically values where a response is needed or not as likely to happen.
  - Time Element: like one year, one quarter, over a 3 year timeframe, etc.

Organization and Examples of Risk Tolerance Statements

1 Capital Preservation

"Under adverse scenarios, we will preserve capital sufficient to execute our strategic plan and maintain our business viability"

Risk	Measure	Likelihood	Threshold
Surplus Stress	Change in Surplus	1:100	< 15% of PHS
Catastrophe Loss	Net PML (1 Event)	1:250	< 20% of PHS

2 Earnings Stability

"We value earnings stability across the cycle, and will maintain our discipline to deliver consistently profitable results to achieve an A rating"

Risk	Measure	Likelihood	Threshold
Earnings Stress	Net Operating Loss	1:10	Net Income <$0
UW Cycle	Combined Ratio	1:10	CR >100%

3 Liquidity Maintenance

"We will maintain enough liquid assets to manage day to day cash flow needs and pay for any unexpected losses"

Risk	Measure	Likelihood	Threshold
Illiquidity	Quick Liquidity	1:10	Quick Liquidity < 20%
Cash Flow	Oper Cashflow	1:10	Oper Cashflow < 100%

4 Franchise Protection

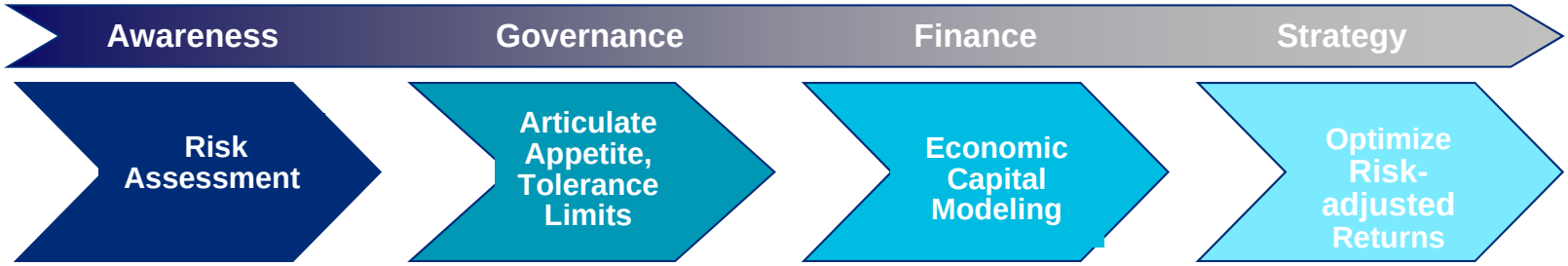
"We value our customers and distribution network, and will strive to protect our brand by maintaining our company's reputation and financial strength rating".

Risk	Measure	Likelihood	Threshold
Downgrade < A-	Standard BCAR	1:10	Standard BCAR <175%
Operational	Loss of PIF	Deterministic	Loss of "Material" PIF

Risk tolerance statements need to be relevant to your company, responsive to A.M. Best's expectations, and supported by capital modeling

Capital Modeling in an ERM Framework

Enterprise Risk Management – Economic Capital Modeling



- Insurance companies are working within all four stages of ERM
- Insurance companies with NAIC's ORSA requirements are developing fully functional enterprise risk and capital management discipline through ECM
- Benefits of Aligning Risk and Capital through Economic Capital Modeling
  - Improves operational and financial decision making
  - Supports profitable growth
    - Identifies each business segment's contribution to enterprise risk
    - Riskier business units consume more economic capital (more risk – more capital)
    - Benchmarks performance relative to capital consumed
      - Risk-adjusted returns
  - Drives capital efficiencies
  - Meets Regulatory needs

Guy Carpenter has a suite of tools to assist with ECM needs

Planning Versus Economic Capital Modeling (ECM)

- The purpose is…..
  - The main purpose of capital modeling is to understand risk and the “distribution” around an expected result. A continuum of results and relative probabilities.
  - The main purpose of planning is to understand the “expected” result or drive the organization towards a “desired” result. A deterministic or scenario approach.
- The construction is….
  - ECM is generally build up from determining parameterized loss distribution for all the risks of an organization. Mainly line of business for UW risk.
  - Planning is generally build up from state specific plans for marketing, rate changes, loss ratio, exposure changes, etc. All at deterministic values.
- Users/builders of the models….
  - ECM is mostly an Actuarial function to derive.
  - Planning is mainly a financial/accounting function to derive
- Despite the above differences the two modeling approaches must be linked and this is sometimes the difficulty.

Possible Reasons to Perform Capital Modeling

1. Determine your capital needs / determine excess capital you have
   - At some point, regulators and rating agencies will ask companies this question
2. To allocate capital for risk adjusted return measurement of performance
3. To develop risk tolerance statements / check current risk tolerance levels
4. Meet regulatory needs such as ORSA, AM Best, etc.
5. Industry Recognition / Peer Reputation
6. Intellectual Curiosity
7. Today I want to do xxx but tomorrow I would like to do yyy – planning ahead
8. How do I compare to peers for certain risks?
9. A better understanding of Cat, Asset, Pricing, and Reserve risks
10. Our Board is asking questions on capital modeling and ERM

Framing the Discussion - Capital Modeling Issues and Questions

1. Why are you doing capital modeling?
2. Do you have the knowledge to do capital modeling?
3. Do you have the resources to do capital modeling?
4. Do you have the time to build a capital model?
5. Does the model need to be stochastic or deterministic?
6. How important is ease of use in building a capital model?
7. How would you use the model (model implementation versus model building)?

How Would a Company Benefit from Economic Capital Modeling

Purpose:

Serves to **quantify Company's risk profile** and is an important component for strategic decision-making

Applications

Communication with Board and Rating Agencies

Understanding the components of required capital

Measure of Total Company Risk Profile

Confirm current business plan complies within Risk Tolerance Statements

Ceded Reinsurance Evaluation and Optimization

Allocate reinsurance costs more accurately

Capital Allocation (explicit application of risk appetite)

Returns by line measured in a more robust, risk-adjusted manner

Planning ahead for NAIC's ORSA Requirements

Guy Carpenter's Capital Modeling Solution Spectrum

GC SOLUTION	DESCRIPTION	PRINCIPAL USES
GC Financial Planning Tool™	**Deterministic capital model** designed to support traditional capital management and financial planning	• Multi-year financial projections • Stress testing • BCAR evaluations
BenchmaRQ®	**Standardized pre-built capital modeling service** from public source data and proprietary risk models	• One-year stochastic financial projections • Benchmark risk profile • Inform risk tolerance-setting • User-friendly reports and analyses to foster deeper understanding of use of capital models
BenchmaRQ+®	**Customized pre-built capital modeling service** including company-specific enhancements to BenchmaRQ	• Single or multi-year stochastic projections • Customize BenchmaRQ for UW planning, reserve risk and non-cat reinsurance
MetaRisk®	**License to build a capital model** using the industry's only timeline-based software **with training and support** from capital modeling experts	• Single or multi-year stochastic projections • Customized, flexible modeling of UW risk, reserve risk, assets, credit risk, and reinsurance • Comprehensive risk assessments • Enhance risk-reward decisions • Improve ERM and ORSA processes

Simple to Complex, Deterministic to Stochastic, Companies can use multiple approaches to ECM

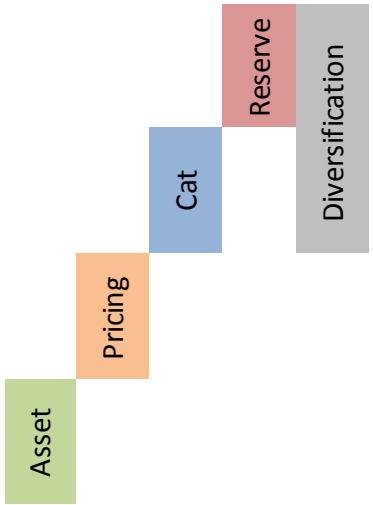
Operationalizing a Economic Capital Model

Understanding Your Risk Categories
How Do I compare to Peers?

We decompose the **11.5%** CV of Change in Surplus into **marginal risk source**.

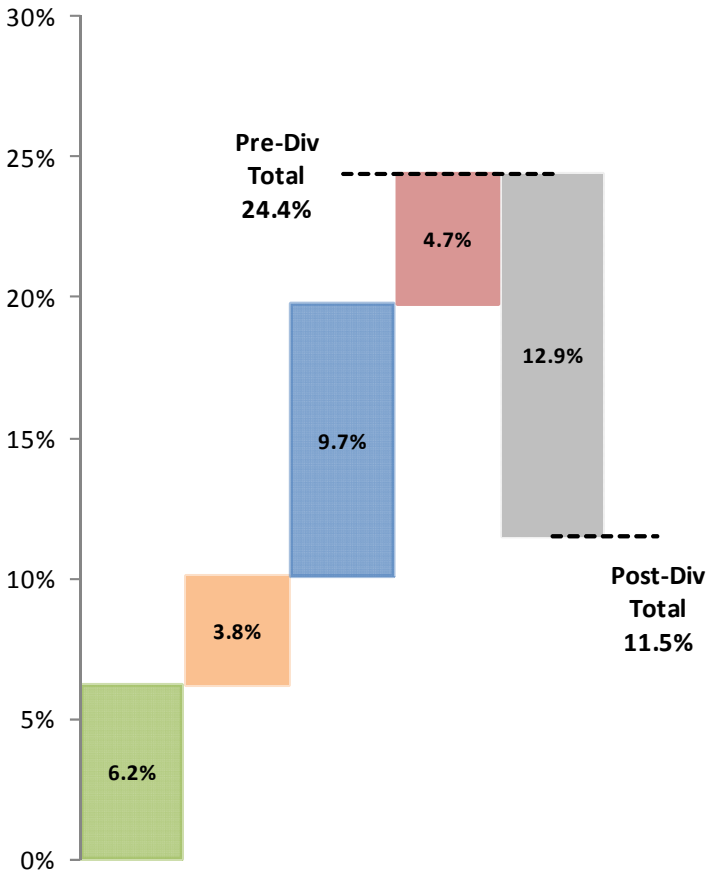
Total volatility is less than the sum of individual risk sources due to **diversification and tax effects**.

The risk profile is the **company's identity.**



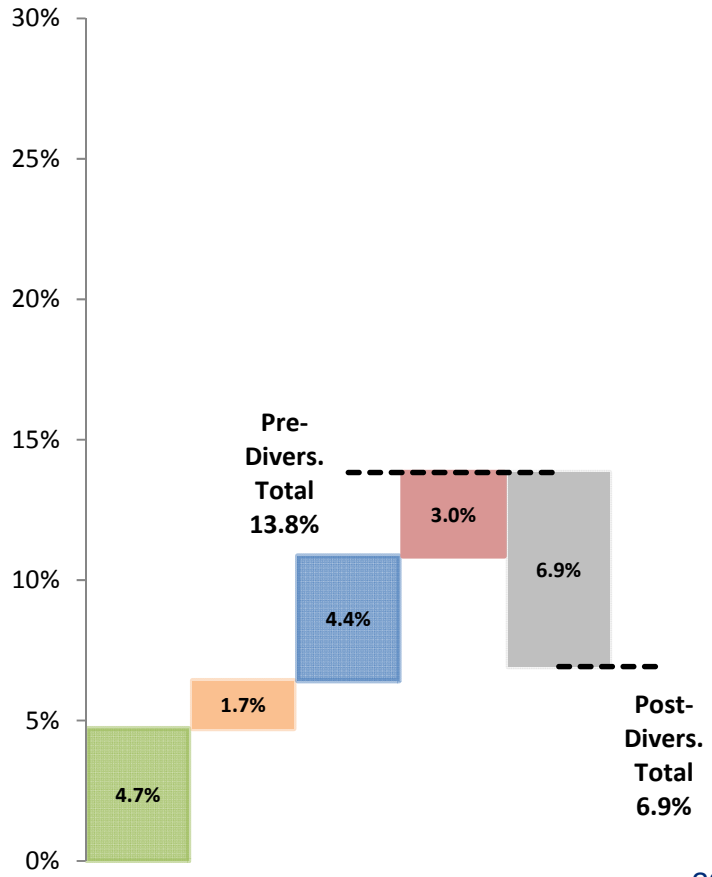
Company:

Company x



Peer Composite:

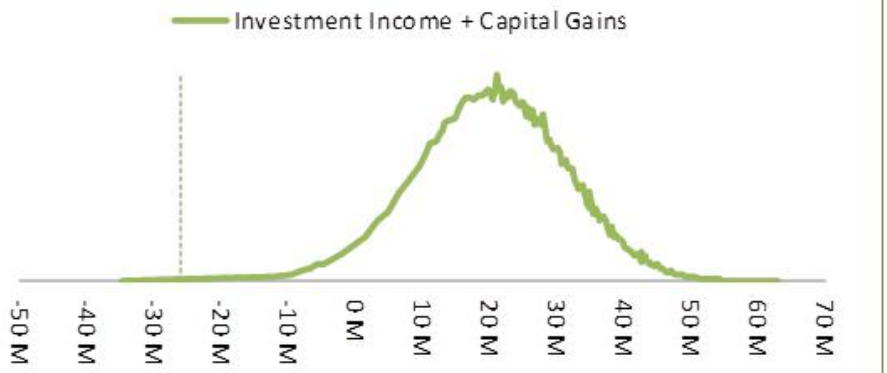
Mutuals 50-500M



Dig A Little Deeper

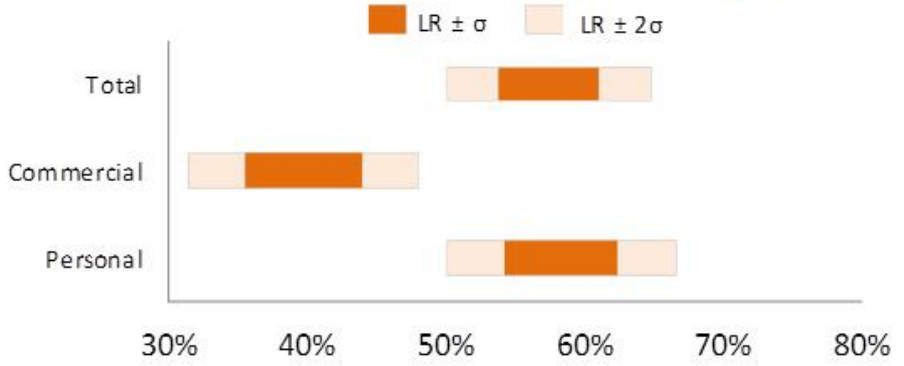
Asset Risk

Risk Measure	Definition	X	Peer
Leverage	Inv Assets / PHS	1.97	2.05
1:100 Event	Asset Loss / PHS	6%	13%



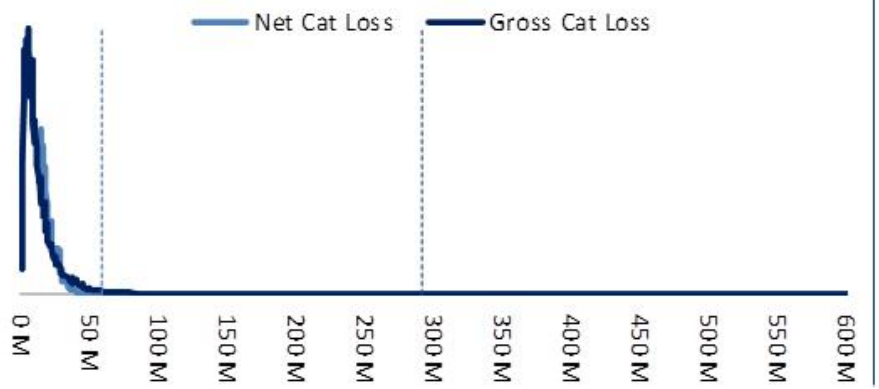
Pricing Risk

Risk Measure	Definition	X	Peer
Leverage	NWP / PHS	1.09	0.64
1:100 Event	UW Loss / PHS	10%	5%



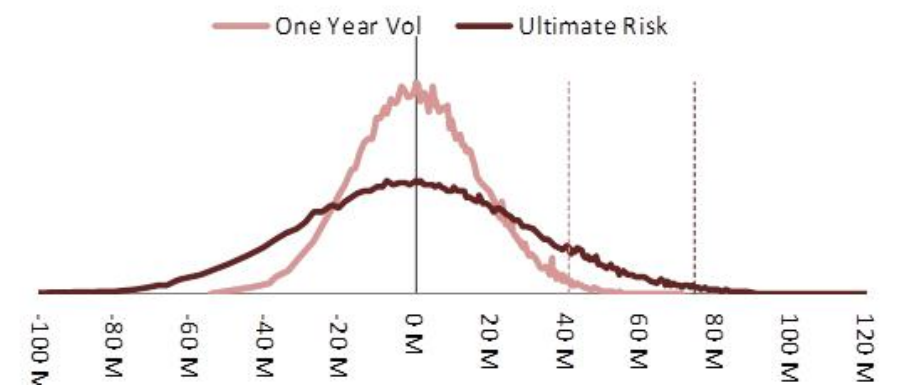
Cat Risk

Risk Measure	Definition	X	Peer
Leverage	AAL / PHS	0.04	0.03
1:100 Event	Net AEP PML / PHS	14%	13%

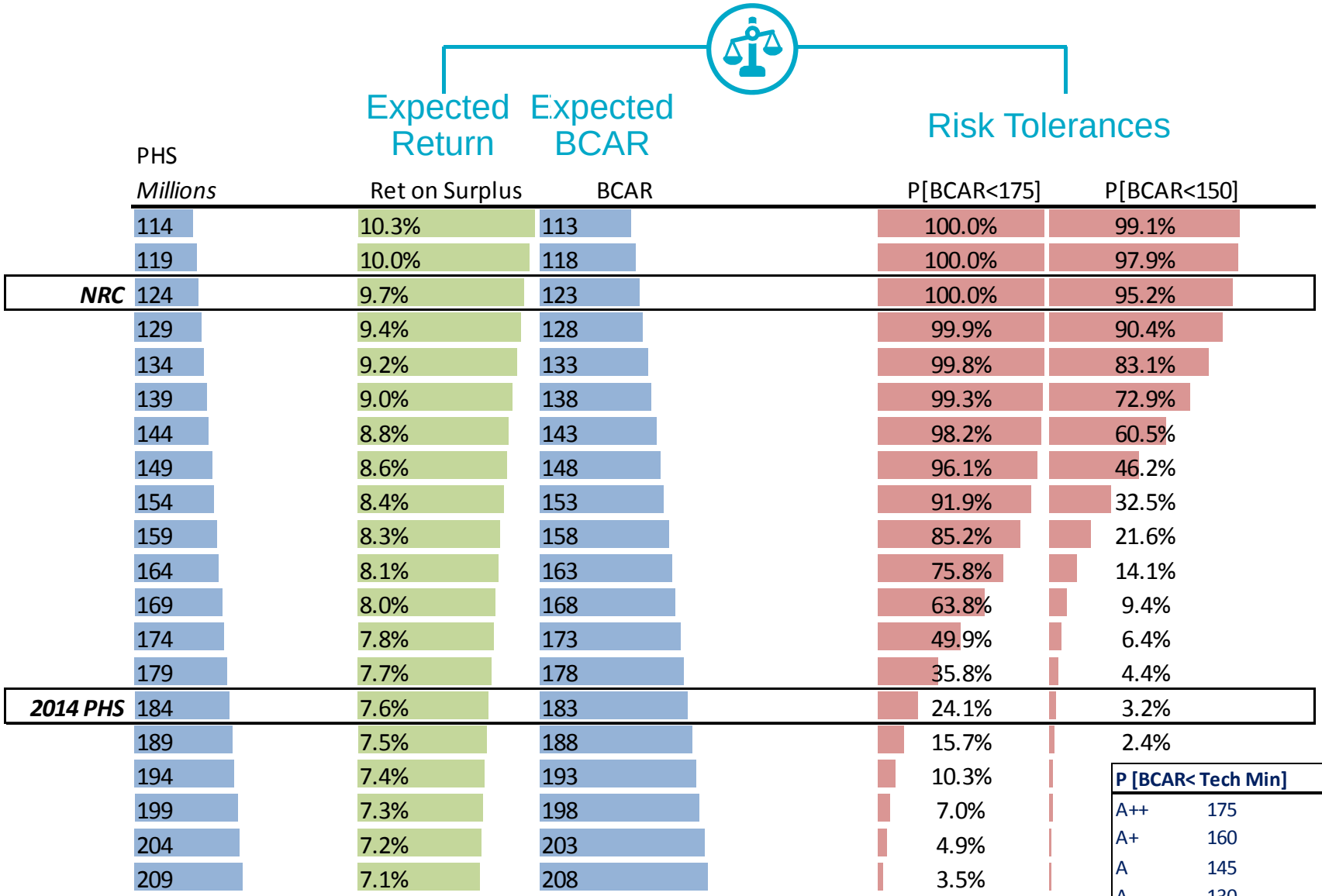


Reserve Risk

Risk Measure	Definition	X	Peer
Leverage	Net Res / PHS	0.78	0.79
1:100 Event	1-Yr Res Dev / PHS	10%	8%
1:100 Event	Ult Res Dev / PHS	18%	24%



An ECM Helps Develop and Validate Risk Tolerance Statements



	PHS *Millions*	Ret on Surplus	BCAR	P[BCAR<175]	P[BCAR<150]
	114	10.3%	113	100.0%	99.1%
	119	10.0%	118	100.0%	97.9%
NRC	124	9.7%	123	100.0%	95.2%
	129	9.4%	128	99.9%	90.4%
	134	9.2%	133	99.8%	83.1%
	139	9.0%	138	99.3%	72.9%
	144	8.8%	143	98.2%	60.5%
	149	8.6%	148	96.1%	46.2%
	154	8.4%	153	91.9%	32.5%
	159	8.3%	158	85.2%	21.6%
	164	8.1%	163	75.8%	14.1%
	169	8.0%	168	63.8%	9.4%
	174	7.8%	173	49.9%	6.4%
	179	7.7%	178	35.8%	4.4%
2014 PHS	184	7.6%	183	24.1%	3.2%
	189	7.5%	188	15.7%	2.4%
	194	7.4%	193	10.3%	
	199	7.3%	198	7.0%	
	204	7.2%	203	4.9%	
	209	7.1%	208	3.5%	

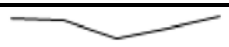
P [BCAR< Tech Min]		
A++	175	24.1%
A+	160	6.5%
A	145	2.3%
A-	130	1.1%
B++	115	0.6%
B+	100	0.4%

BenchmaRQ Highlights: Capital Preservation/Earning Stability

2017 Risk-Aware Balance Sheet

	2016 Actual	2017 Simulated Mean	1 in 2 Favorable Year	1 in 20	1 in 100	1 in 250	Historical Performance (2011 - 2015)
Bonds	79.4	81.7	84.4	76.5	75.5	76.0	
Stocks	29.1	31.1	32.3	28.7	25.8	22.1	
Cash	3.8	3.7	3.8	3.3	2.3	0.9	
Other Invested Assets	2.0	2.0	3.3	1.9	1.9	1.9	
Total Invested Assets	114.3	118.5	123.8	110.3	105.4	100.9	
Other Assets	19.7	19.7	17.8	21.0	21.5	21.3	
Total Assets	**134.1**	**138.2**	**141.7**	**131.3**	**126.9**	**122.2**	
Net Loss & ALAE Reserves	18.6	19.0	18.3	20.6	21.2	21.5	
Net UEP Reserves	35.7	37.8	37.8	37.8	37.8	37.8	
Other Liabilities	7.3	7.3	7.3	7.3	7.3	7.3	
Total Liabilities	61.7	64.1	63.4	65.7	66.3	66.6	
Surplus Notes	0.0	0.0	0.0	0.0	0.0	0.0	
Statutory Surplus	**73.6**	**74.0**	**78.3**	**65.7**	**60.6**	**55.6**	
Return on Surplus							
Company A	**11.0%**	**0.7%**	**6.4%**	**(10.7%)**	**(17.6%)**	**(24.4%)**	
Company B	**6.3%**	**2.9%**	**8.6%**	**(8.5%)**	**(14.5%)**	**(20.6%)**	
Company C	**2.3%**	**5.5%**	**12.2%**	**(2.1%)**	**(11.7%)**	**(184.9%)**	
Company D	**16.7%**	**10.0%**	**16.3%**	**(3.7%)**	**(10.7%)**	**(15.0%)**	

BenchmaRQ Highlights: Capital Preservation
2017 Risk-Aware Income Statement

	2016 Actual	2017 Simulated Mean	1 in 2 Favorable Year	1 in 20	1 in 100	1 in 250	Historical Performance (2011 - 2015)
Net Earned Premium	62.9	66.4	66.4	66.4	66.4	66.4	
Net Incurred Loss	32.9	43.5	40.8	48.8	51.9	56.4	
Net Underwriting Expenses	23.1	25.0	25.0	25.0	25.0	25.0	
Underwriting Gain	**7.0**	**(2.1)**	**0.6**	**(7.4)**	**(10.5)**	**(14.9)**	
Investment Income	2.3	2.1	2.1	2.2	2.3	2.3	
Realized Capital Gains	0.1	0.7	1.2	(0.0)	0.1	0.9	
Other Income	2.4	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	
Policyholder Dividends	0.0	0.0	0.0	0.0	0.0	0.0	
Income Tax	3.7	0.0	0.8	(1.5)	(1.9)	(2.1)	
Net Income	**8.0**	**0.4**	**2.8**	**(4.0)**	**(6.5)**	**(9.9)**	
Change in Unrealized Capital Gains	1.7	0.1	2.5	(5.2)	(8.1)	(9.6)	
Deferred Taxes & Other Changes	5.6	0.0	0.6	(1.3)	(1.8)	(1.6)	
Change In Surplus	**7.3**	**0.5**	**4.7**	**(7.9)**	**(12.9)**	**(18.0)**	
Combined Ratio							
Company A	**87.9%**	**102.1%**	**98.0%**	**110.0%**	**114.8%**	**121.4%**	
Company B	**98.2%**	**99.8%**	**93.7%**	**111.4%**	**118.3%**	**123.1%**	
Company C	**99.3%**	**94.2%**	**89.2%**	**97.8%**	**108.1%**	**299.4%**	
Company D	**83.9%**	**92.2%**	**87.4%**	**102.6%**	**108.7%**	**112.2%**	

Questions?

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