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28 June 2007

ERM: Issues and Applications

CAA, MAF and PRMIA Joint Conference
Sponsored by The Jacobson Group

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Overview

- **ERM: The Basics**
 - What is ERM?
 - Why?
 - What is the Role of Rating Agencies and Regulatory Bodies?
- **ERM: Beginning The Journey**
- **ERM: A Foundation for Capital Models**
 - Using Capital Models to Create Value
 - Capital Adequacy
 - Capital Allocation
 - Capital Structure
- **Current Practices**



ERM: The Basics

What is ERM?

- Embedded in an organization's "culture"
- Involves a broad identification and assessment of risk
- Allows for enterprise-wide measures of risk
- Links enterprise-wide risk metrics to corporate risk appetite and economic capital
- Allows management to see the impact of strategic alternatives on
 - expected profitability, and
 - organization-wide measures of risk



Why ERM?

- Rating Agencies
- Regulatory Requirements
- Actually, good business discipline that will
 - Design successful business plans
 - Better align management
 - Transparency and awareness with Boards
 - More efficient use of capital

Regulatory View of ERM

- UK FSA mandatory ERM and internal capital modeling began in 2004
- EU Solvency II taking similar tack, targeted for rollout in 2009
- International Association of Insurance Supervisors mirrors Solvency II
 - Likely to propagate around the world, including...
- NAIC
 - Corporate Governance for Risk Management Act and draft Regulation exposed (*board oversight of enterprise risk management*)
 - P&C RBC Working Group following global movement to full internal company modeling
- Conclusion – NAIC will eventually move to IAIS / Solvency II type model – time frame remains uncertain

*Regulation is not the driver of ERM in the U.S....
Rating Agency focus is.*

A.M. Best ... Position on ERM

- ERM is not a separate component ...
 - Impacts all three areas of rating evaluation
 - *“Risk management is the common thread that links balance sheet strength (capitalization), operating performance, and business profile.”*
- What’s New?
 - Level of Board and Sr. Management focus
 - Greater focus on risk modeling with explicit recognition correlation and the five categories of risk
 - Credit, Market, Underwriting, Operational and Strategic
 - Strategic business opportunities are considered in terms of return potential and their impact on “risk to capital”
 - Will consider allowing companies to maintain BCAR levels below the rating guideline based on the insurer’s overall risk management abilities

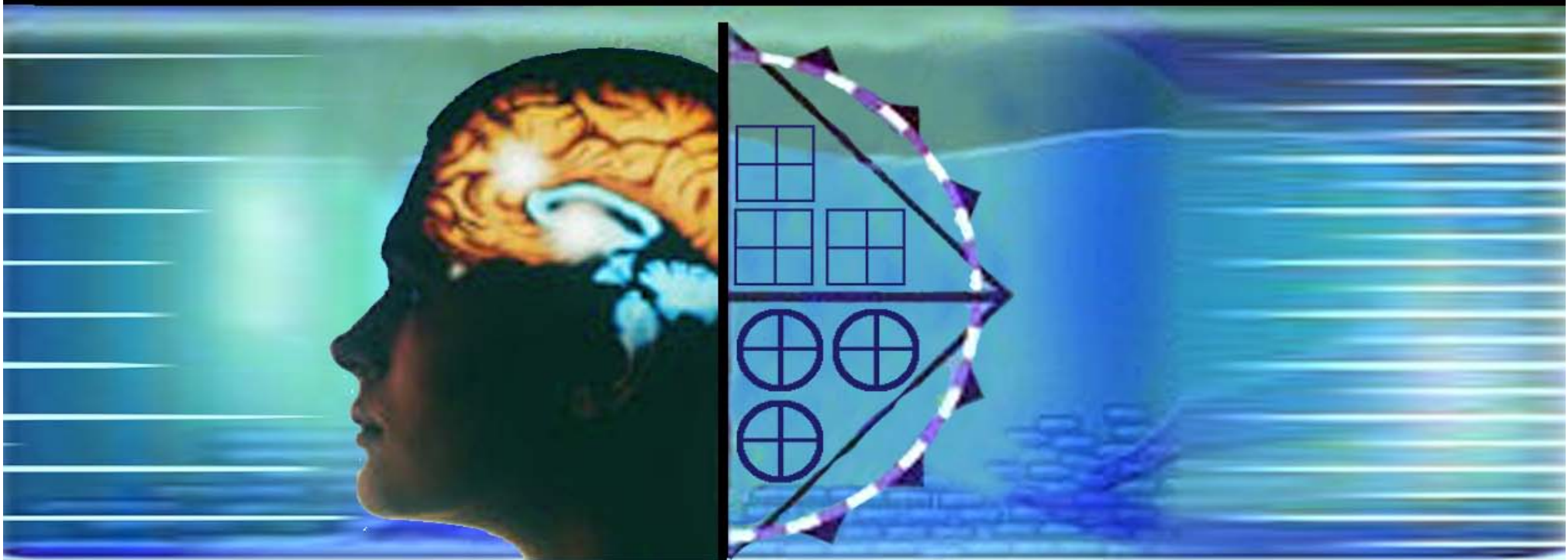
Standard & Poor's ... Position on ERM

- In October 2005, S&P began assessing the ERM practices of insurers
 - Separate major rating category
 - All companies will need to have ERM capabilities to limit their risk exposures and losses to within appropriate tolerances.
- As of Dec. 2006, the ERM practices of 160 companies have been reviewed
 - Most attest to having ERM, majority (80%) were considered “adequate”
- A strong ERM process will
 - Identify risk
 - Set risk tolerances
 - Manage processes to limit risk exposures within risk tolerance
 - Set strategy to optimize risk-adjusted returns
- S&P links ERM to economic capital and strategic risk management
 - Only those companies with a “excellent” or “good” ERM assessment will be invited to present their economic capital models in 2007.



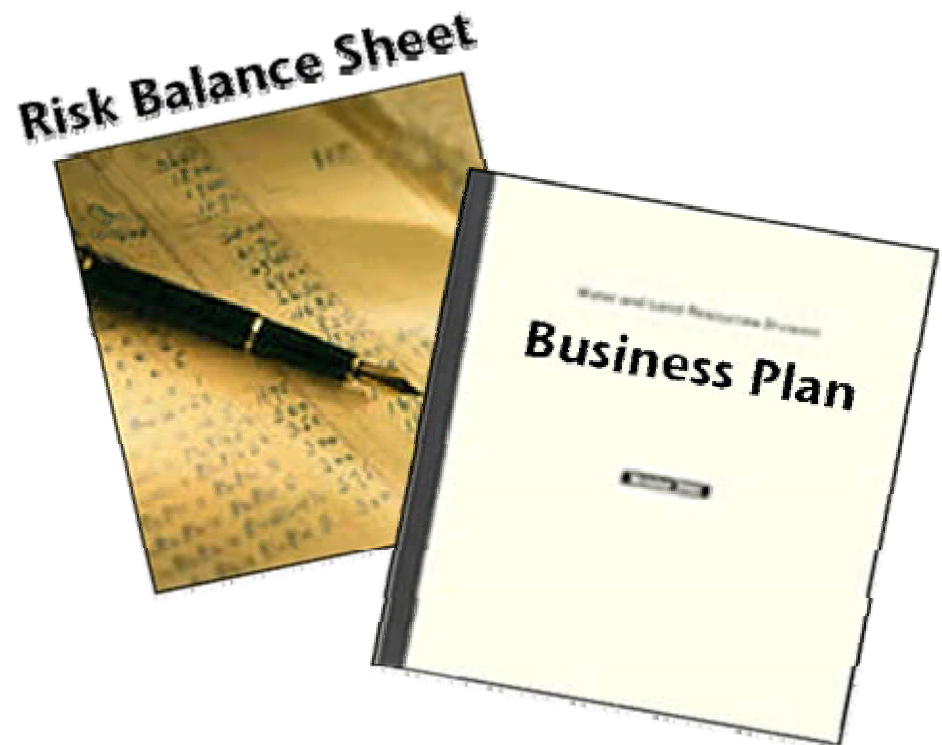
ERM: Beginning The Journey

ERM Behavioral and Empirical



Embedded in the Corporate Culture

- By articulating corporate strategy in terms of risk-adjusted returns, corporate risk culture is strengthened
 - Disciplined Decision Making
 - Design Successful Business Plans
 - Corporate Alignment
 - Transparency and Awareness with Boards

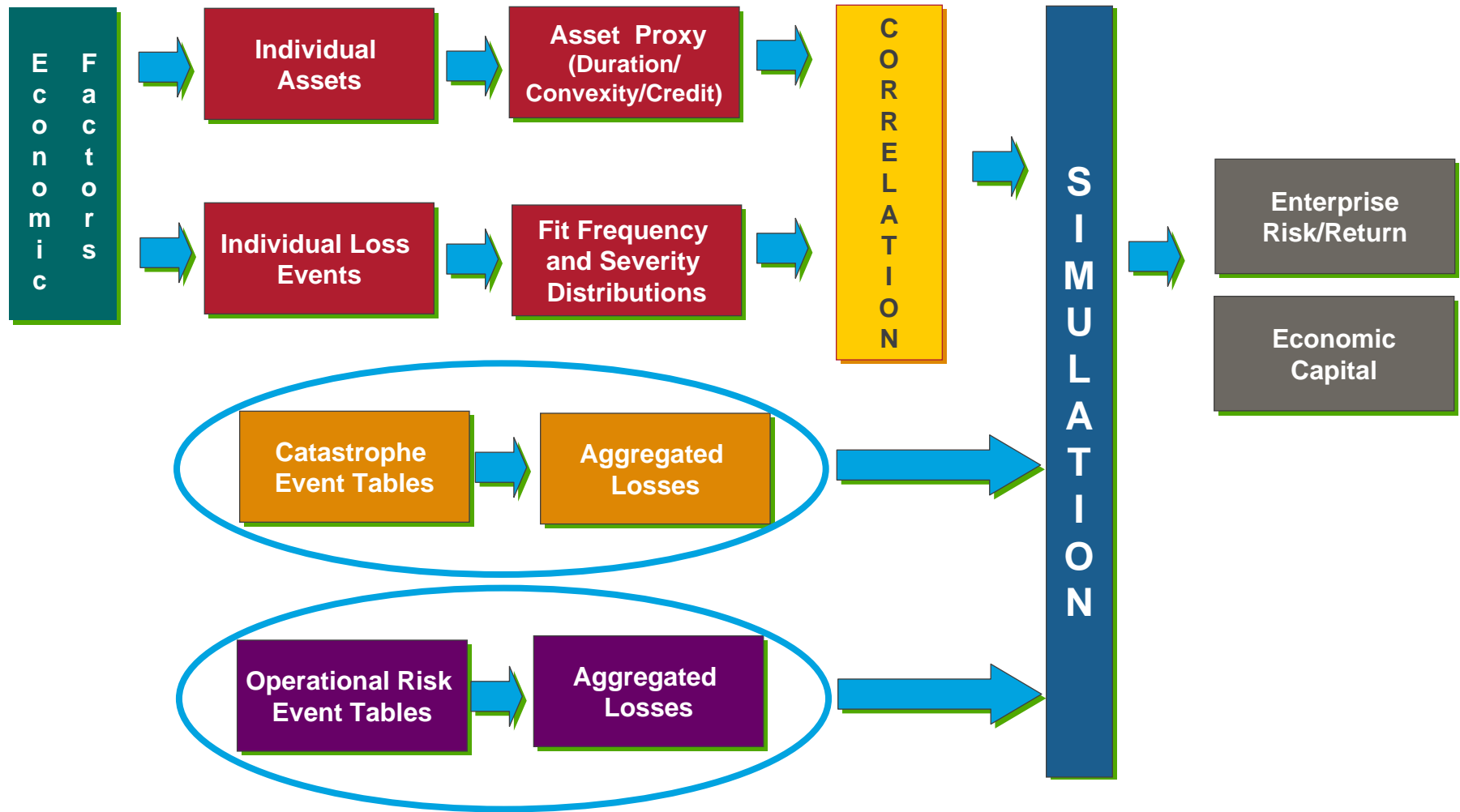




Involves a Broad Identification of Risks

Property-Casualty Insurance
Company Enterprise Risk

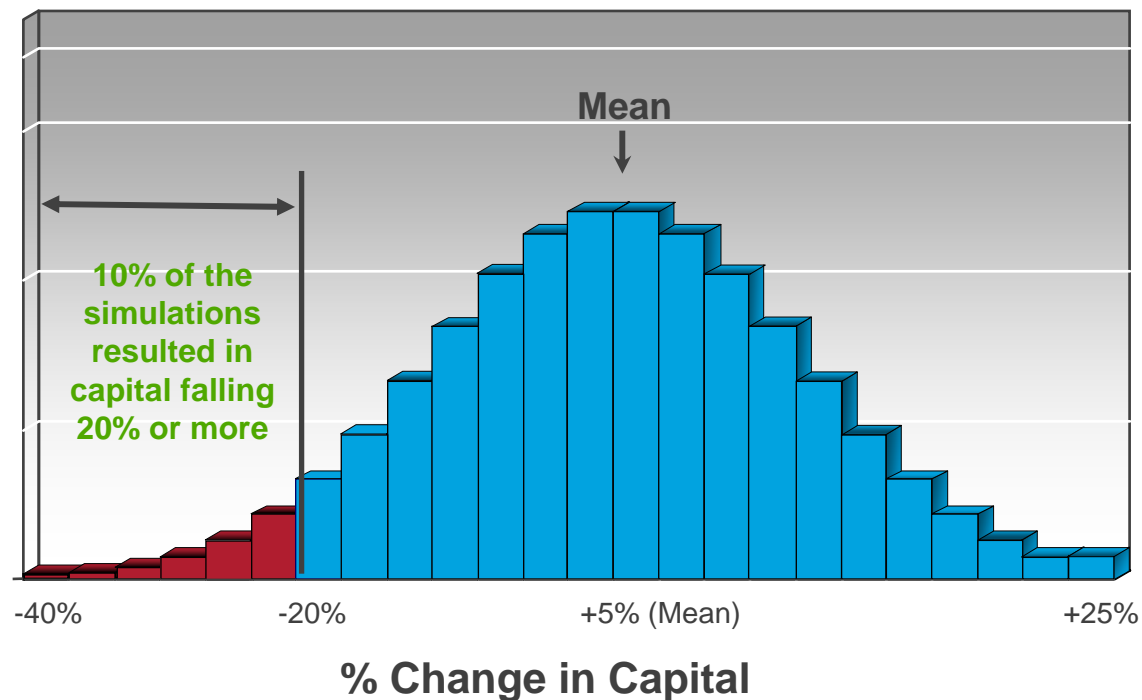
Analytical Process Allows For Enterprise Measures of Risk



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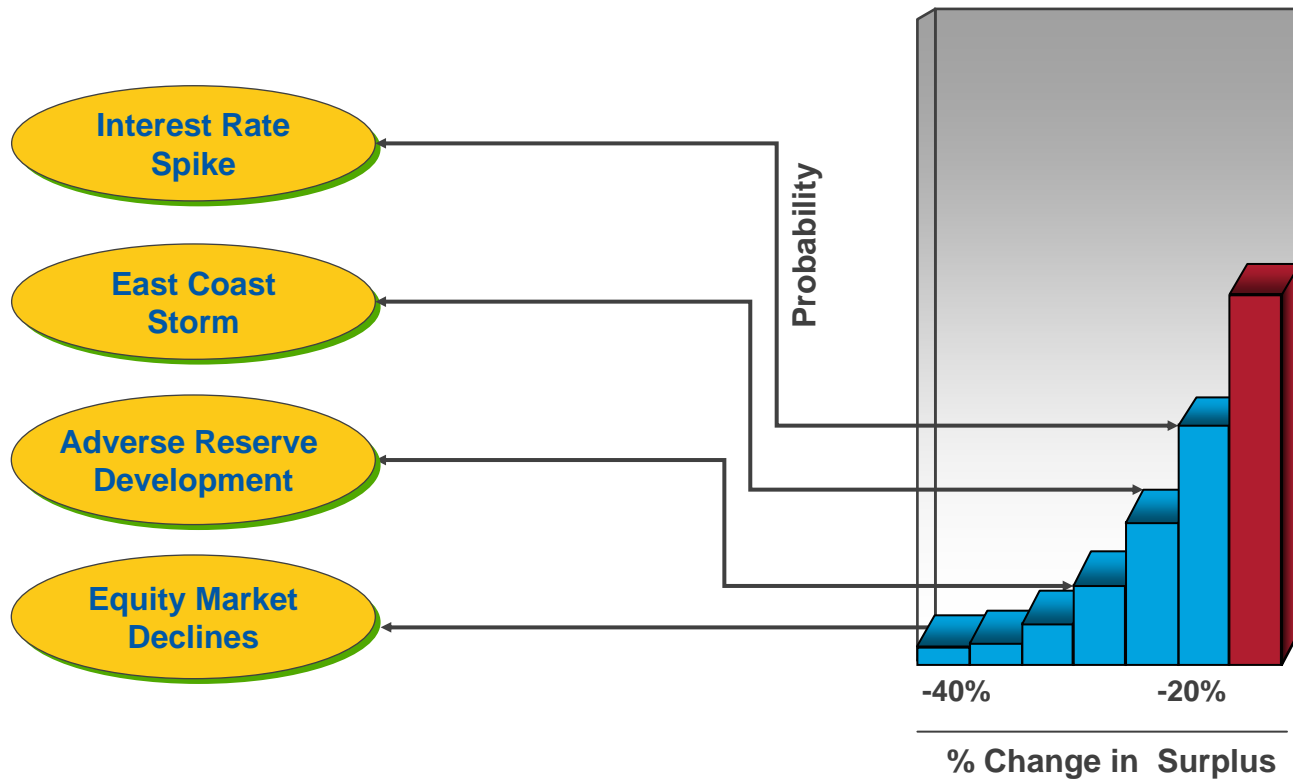
Simulation gives us a new measure of risk – “Capital-at-Risk”

CaR is the probability of a decline in capital – for example, the probability of a 20% decline in capital is 10% (a 1 in 10 year event)



Analytical Process Allows For Enterprise Measures of Risk

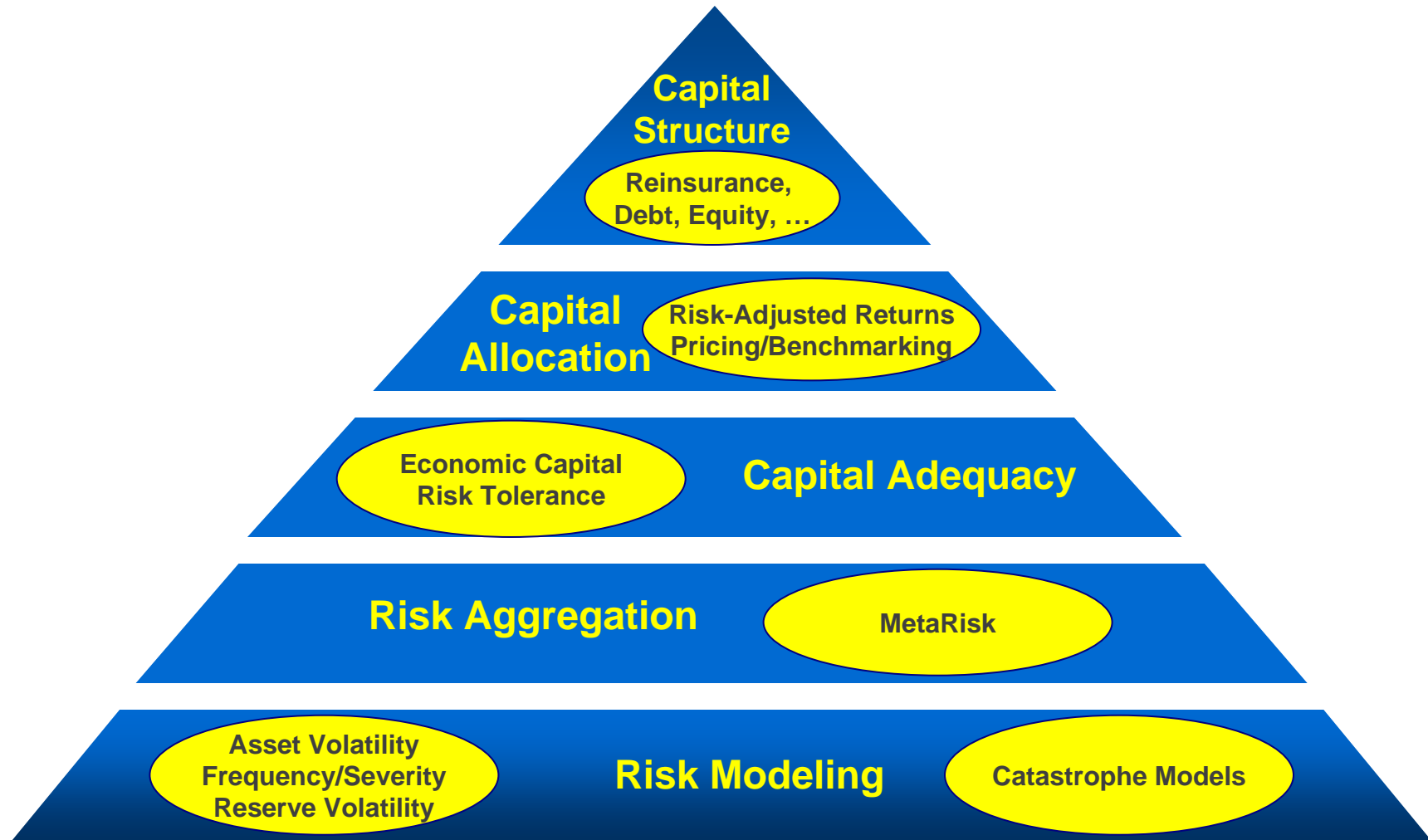
For example, a capital model allows the users to understand the drivers of the bad events by inspecting specific simulated paths





ERM: A Foundation for Capital Modeling

From ERM To Capital Modeling



Capital Management

- Three key “value maximizing” questions about capital
 - Manage the Adequacy of Capital
 - How much capital does the firm require?
 - Too much capital will lower the ROEs...
 - too little capital will increase the cost of capital and impose frictional costs of regulation
 - Maximize Return on Capital
 - Allocate capital to drive growth in lines yielding the highest return on risk-adjusted capital (RORAC)
 - Often referred to as RAROC, risk-adjusted return on capital
 - Minimize the Cost of Capital
 - How does management minimize the cost of capital?
 - Minimize the component cost of capital...cost of debt and equity
 - Achieve the optimal capital structure...balance the various sources of capital

Creating “Economic Value”

$$\text{EVA} = [\text{ROC} - \text{Cost of Capital}] \times \text{Capital}$$

↑
Maximize

Capital Allocation
Very hard in a soft
market

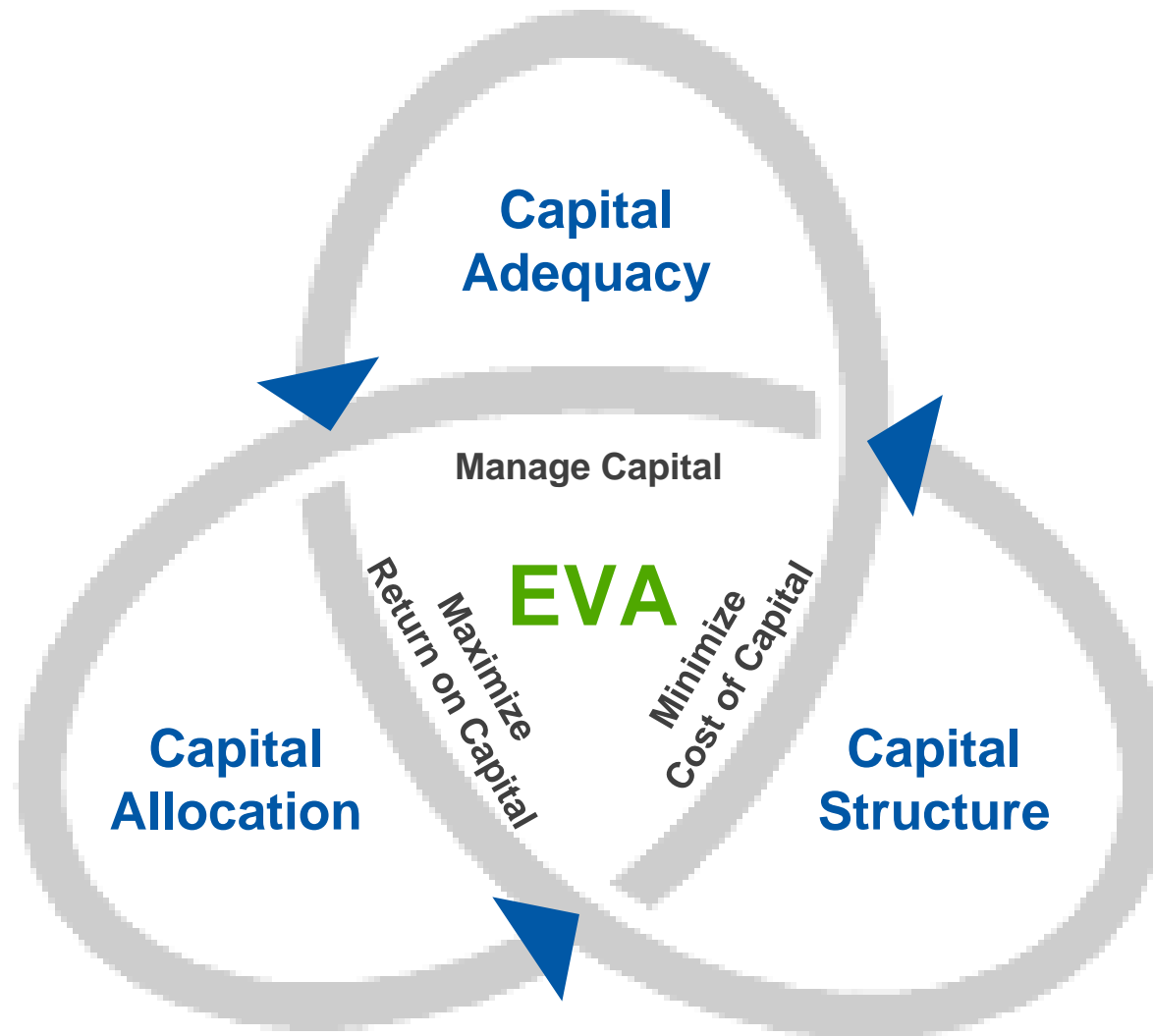
↑
Minimize

Cost of Capital
Blend all sources
of capital to
minimize cost

↑
Manage

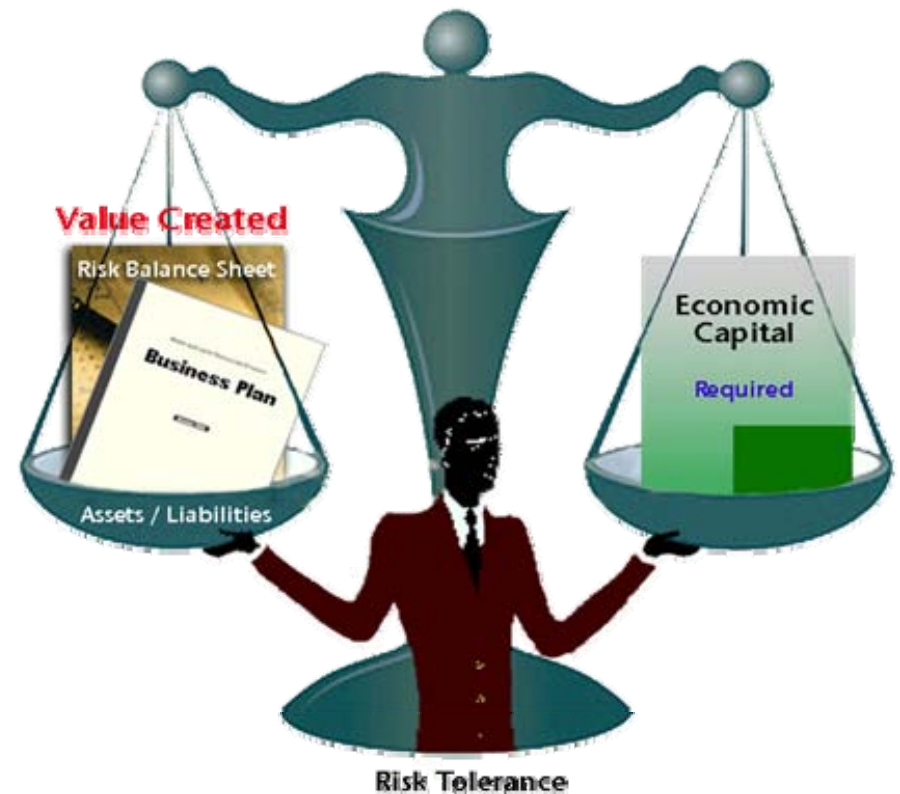
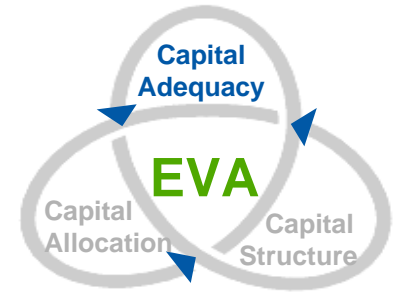
Capital Adequacy
Carry only what you
need

Managing Capital...Three Opportunities to Create Value



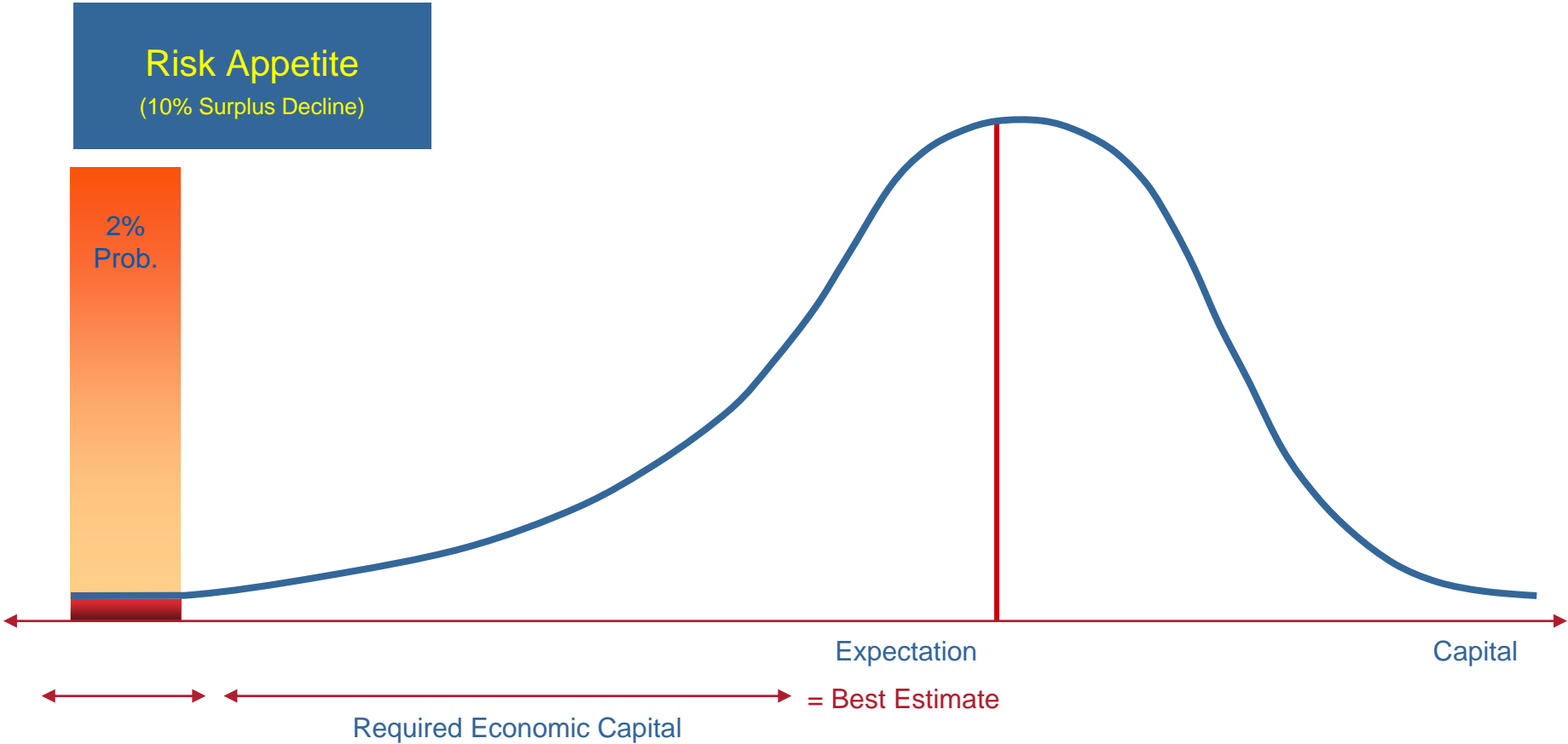
1. Capital Adequacy

- Capital Adequacy
 - How much capital is needed to back the firm's risk portfolio.
 - Financial economics suggests that capital adequacy depends on
 - Current Risk Portfolio
 - Business Plan, and
 - Risk Tolerance
 - But, risk tolerance is not static
 - Dynamic tradeoff between the return on the risk portfolio and the cost of capital

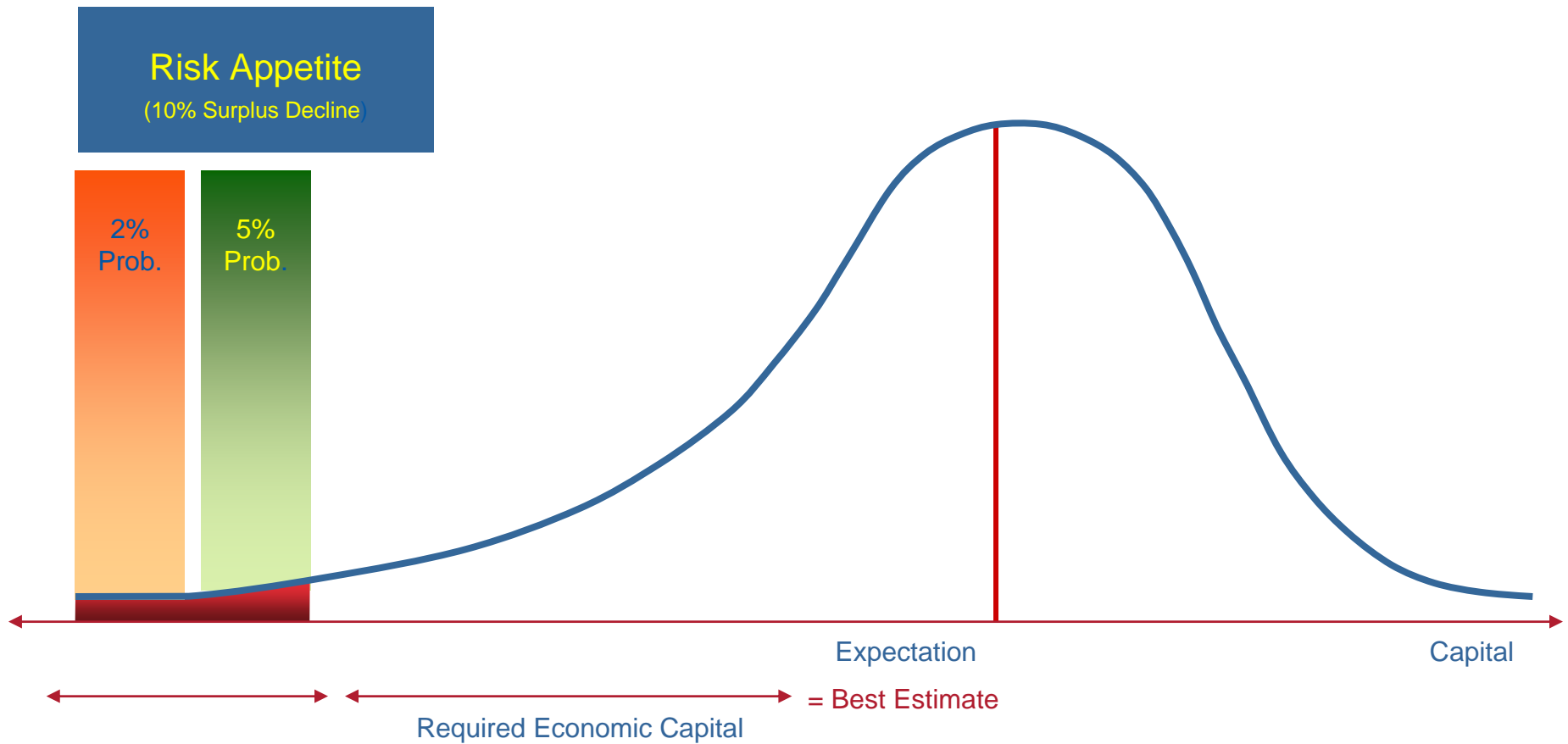




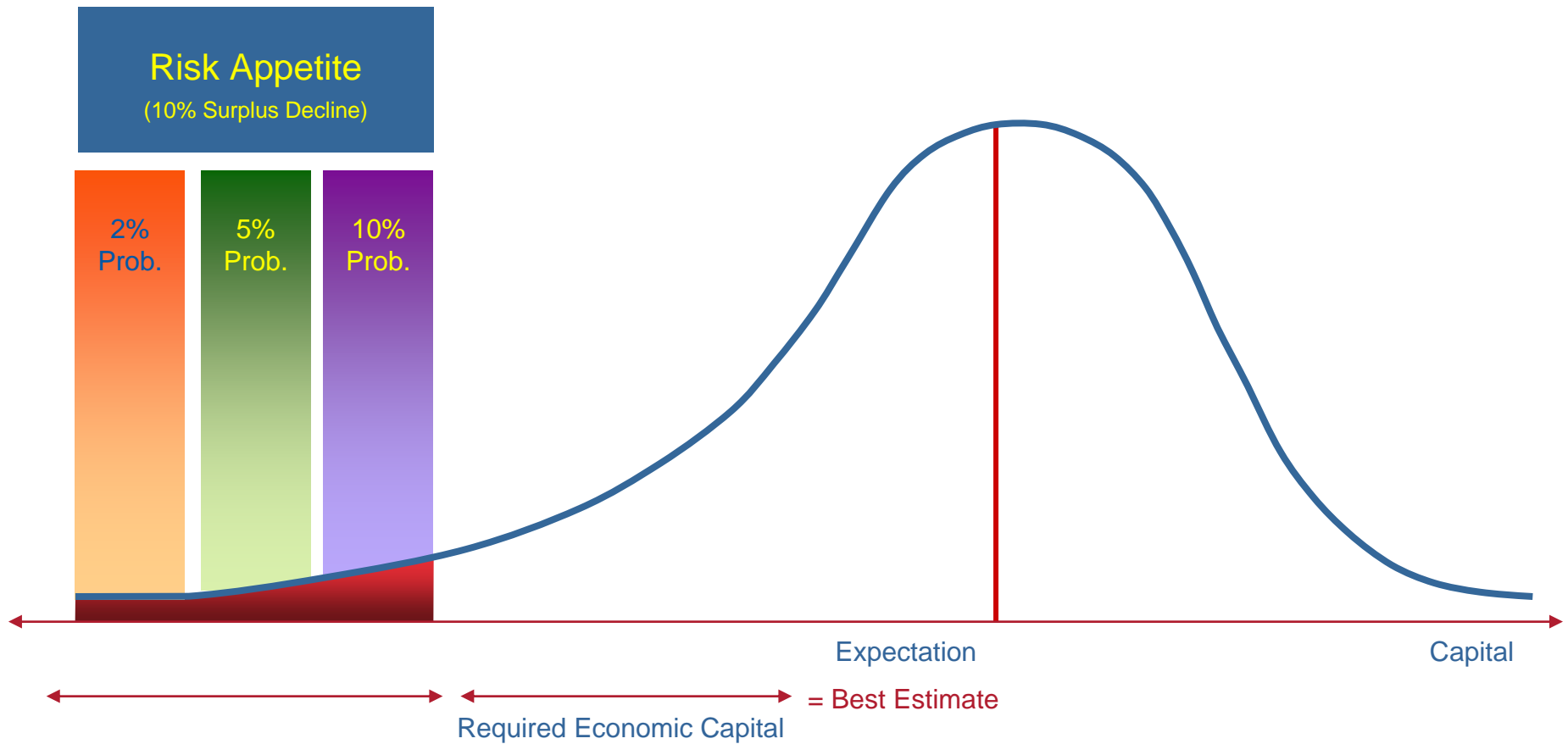
Economic Capital – Depends on Risk Tolerance



Economic Capital - Depends on Risk Tolerance



Economic Capital - Depends on Risk Tolerance

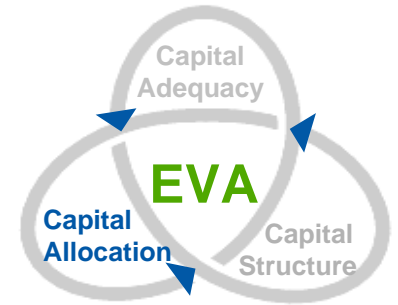


What Is The Appropriate Amount of Risk?

- The appropriate level to risk is cultural, although externalities will place restrictions at the extreme.
- While there is no magic formula, many factors will affect risk tolerance
 - Ownership structure
 - Owners' expectations
 - Opportunities for growth
 - Intensity of oversight from regulators and rating agencies
 - Size
 - Access to new capital
 - Persona of management and board
 - Corporate culture and history
- Above all, recall that risk tolerance is a “dynamic” tradeoff between the return on the risk portfolio and the cost of capital

Capital Allocation Beliefs ... And Common Errors

- Capital is really not divisible
 - But when capital is not allocated we experience a classical problem in economics ... “Tragedy of Commons”
- Capital is free, in particular internal capital is free
 - But contributors of capital require a return equivalent to what they could earn on the money if it had been paid out
 - Retained profits have an “opportunity cost”
- Less capital given some income stream will result in higher ROEs
 - But line/product managers are running a free default put on the company
 - Causes perverse incentives

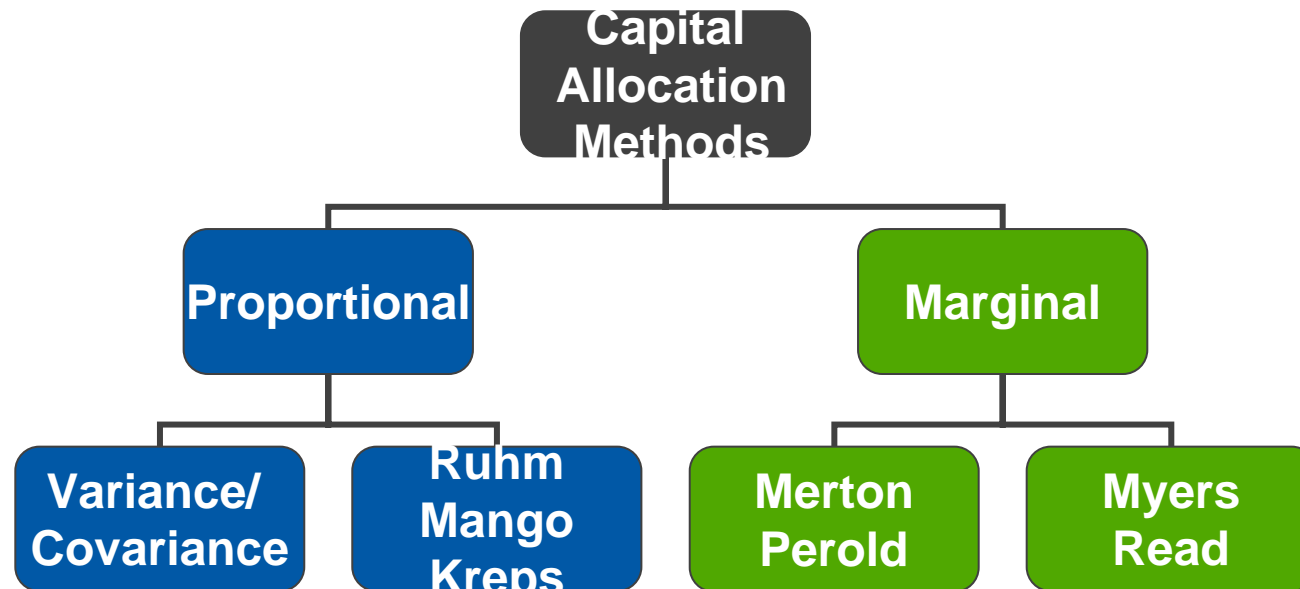


So Why Allocate Capital

- Capital allocation becomes a disciplining mechanism
 - Avoid overuse ... incentive to grow lines/products with highest returns
 - Impute a capital charge when pricing products
 - $ROE > \text{Cost of Capital}$
 - Establishes “fairness” amongst the line/product managers when establishing performance targets

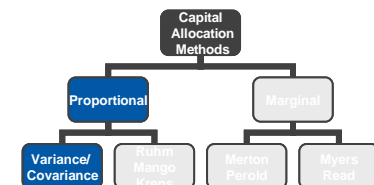
Capital Allocation Techniques

- Numerous methodologies are considered legitimate for allocating capital
 - Proportional Methods
 - Allocate capital in proportion to the segments contribution to enterprise risk
 - Marginal Methods
 - Equalize the marginal default probability across all lines



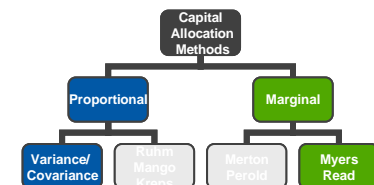
Proportional Methods: Variance/Covariance

- Variance/Covariance
 - Sum of the covariance equals the variance
 - Derive the covariance between the line's underwriting profit and the total underwriting profit across scenarios
 - Allocate capital proportionally ... line's covariance relative to the variance of total underwriting profit



Marginal Methods: Myers - Read

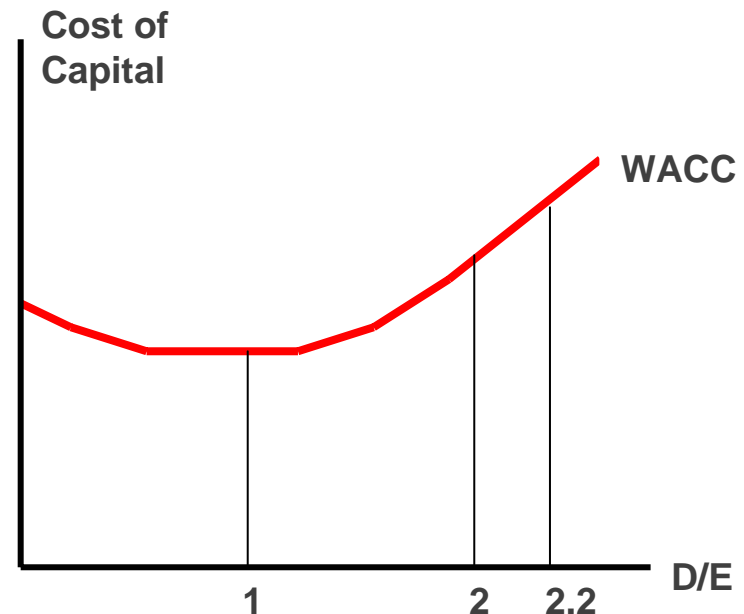
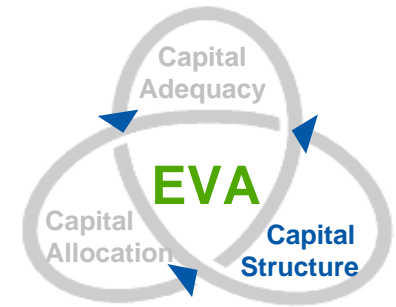
- Myers-Read utilizes a micro marginal allocation approach by measuring the impact of an incremental increase in a business segment's liabilities on the overall default value of the enterprise
 - The goal is to allocate surplus so as to equalize the marginal contribution to default for each of the lines



3. Diversify Our Capital Structure To Minimize The Cost Of Capital

■ Optimal Capital Structure

- Diversifying across the various sources of capital will
 - minimize the cost of capital, and
 - maximize the value of the firm
- The WACC falls initially because of the tax advantage of debt. Beyond the optimal level of debt, the WACC begins to rise because of financial distress costs and agency costs.
- Using alternative sources of capital may lower the WACC



Capital Structure

- Capital Structure
 - How does management blend various sources of capital to minimize the cost of capital
 - Innovations in sources of capital
 - Surplus Notes
 - Catastrophe Bonds
 - Side Cars
 - ILWs
 - And more



Current Practices

AIG In The News ... ERM and Capital Models

holders.” An economic capital model assesses how much capital a company needs to stay solvent with a specified probability given the risks to which it is exposed. The results can be different, sometimes very different, from those arrived at by regulators or rating agencies.

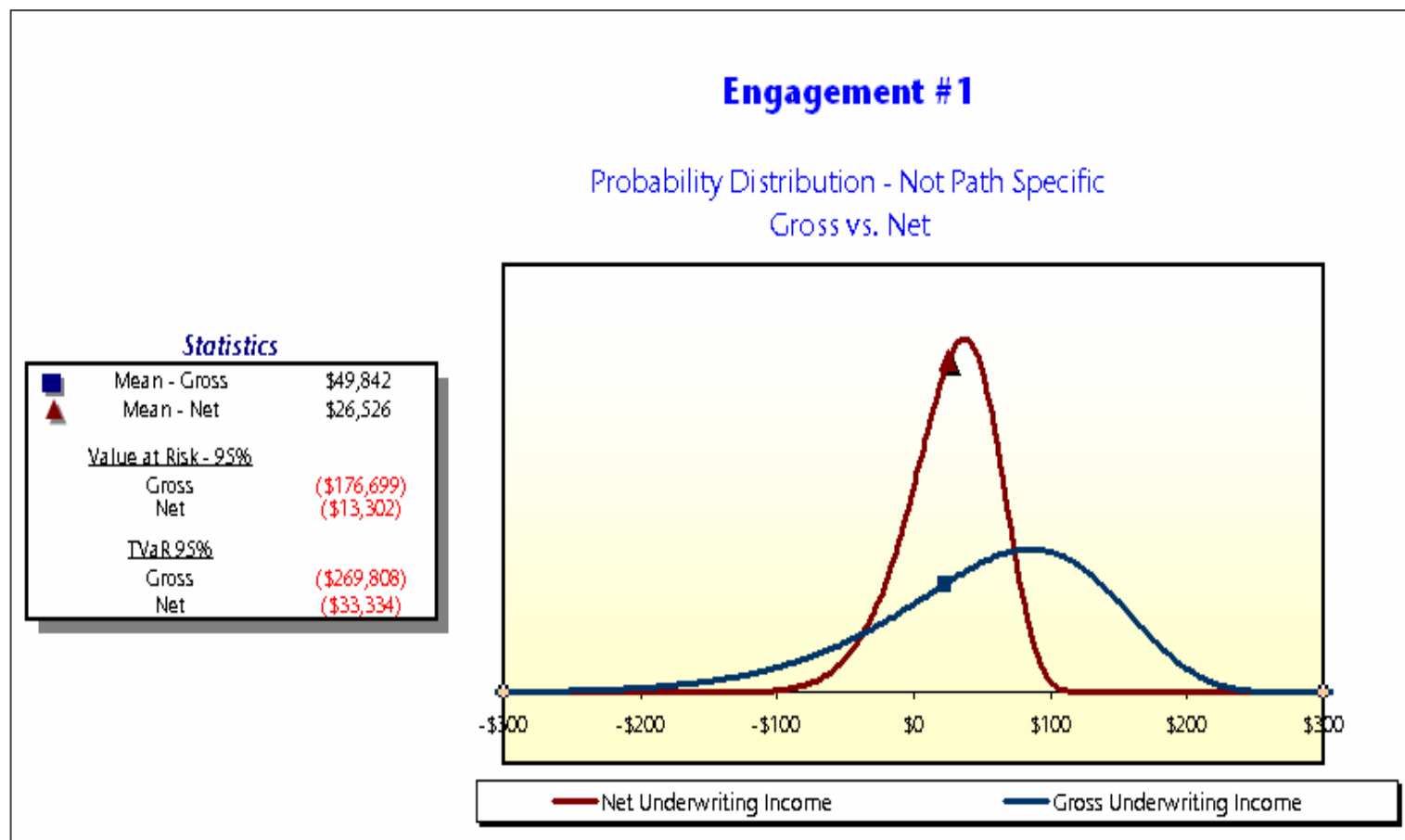
Imagine if an American family with the average net worth of \$300,000 had a close look at its finances and discovered it had \$100,000 to spare. \$100,000 it did not need to live well, retire well and pay the college fees; \$100,000 it could spend on parties.

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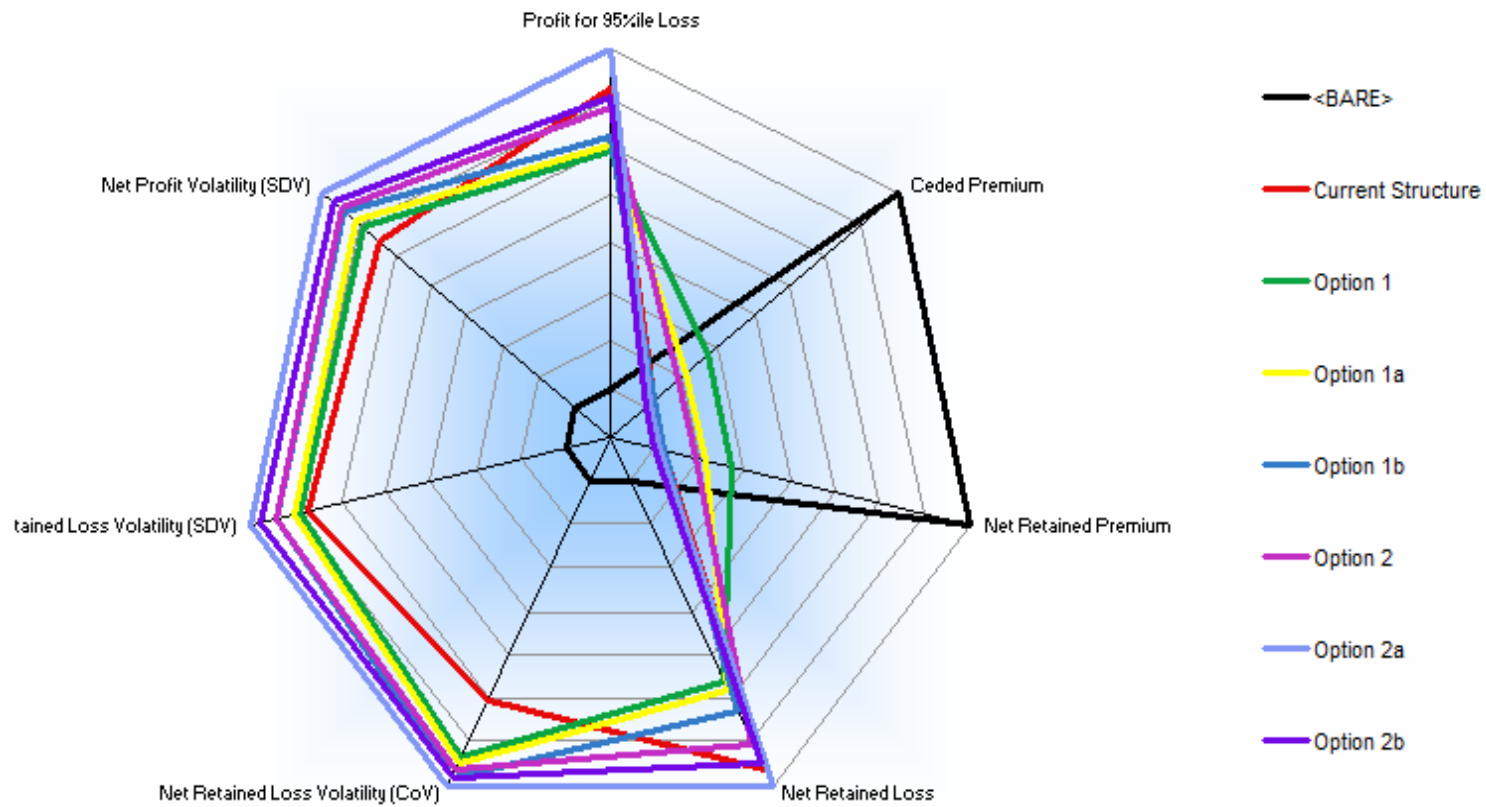
“What we are really driving towards is to develop Mr Bensinger believes that as this process works through, AIG can significantly improve its return on equity, which was 17 per cent last year. Declining to share the precise number he has in mind, he says: “The overall returns on capital will in our view be considerably increased.” Which

The process involved some outside experts. For the modelling, AIG had help from Risk Management Solutions on catastrophic losses, Milliman on general insurance and Mercer Oliver Wyman on life and retirement services. AIG also plans to get independent validation of its model that will probably involve academic experts.

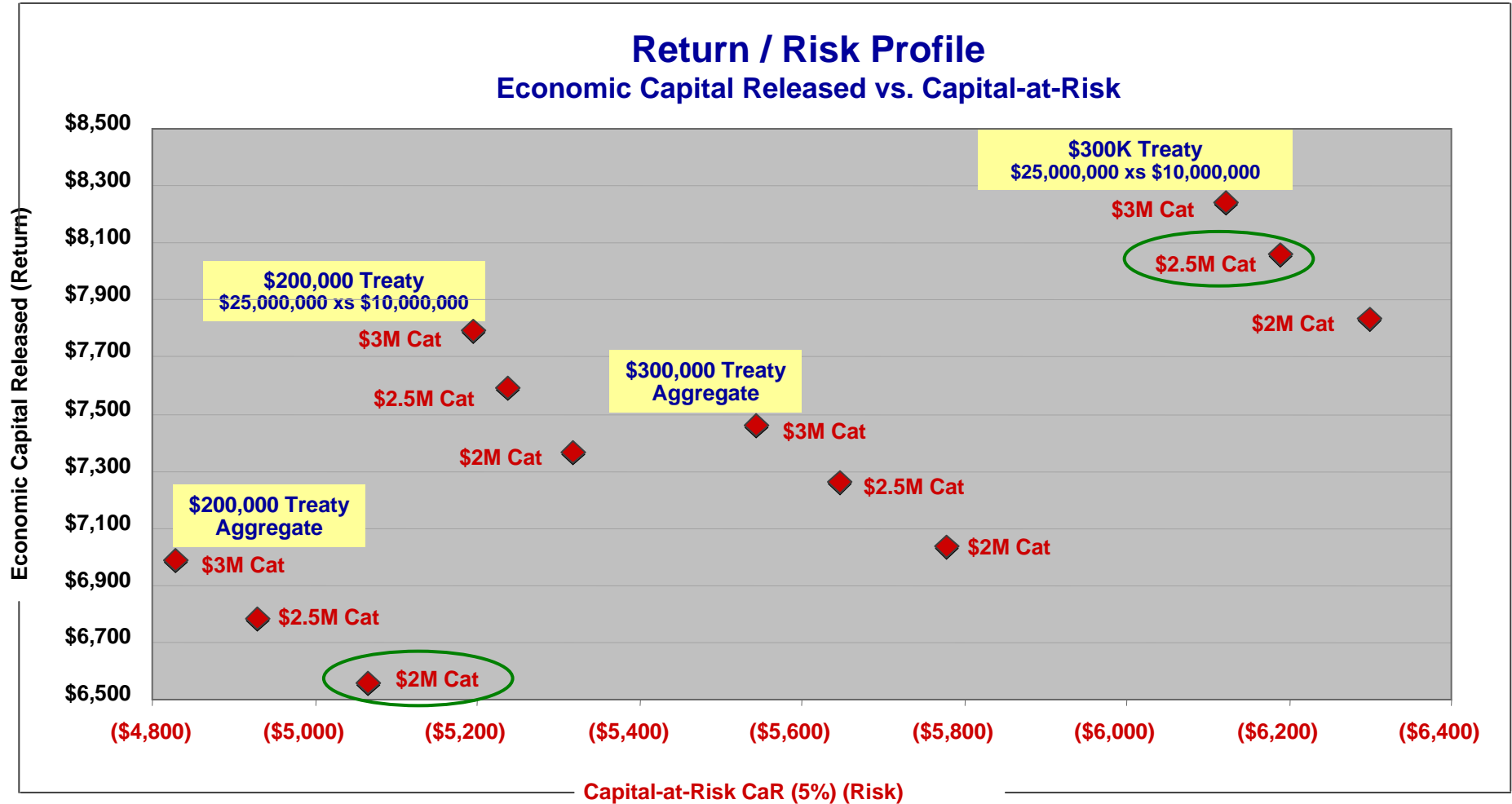
Framing Reinsurance In “ERM” Vernacular



Framing Reinsurance In “ERM” Vernacular



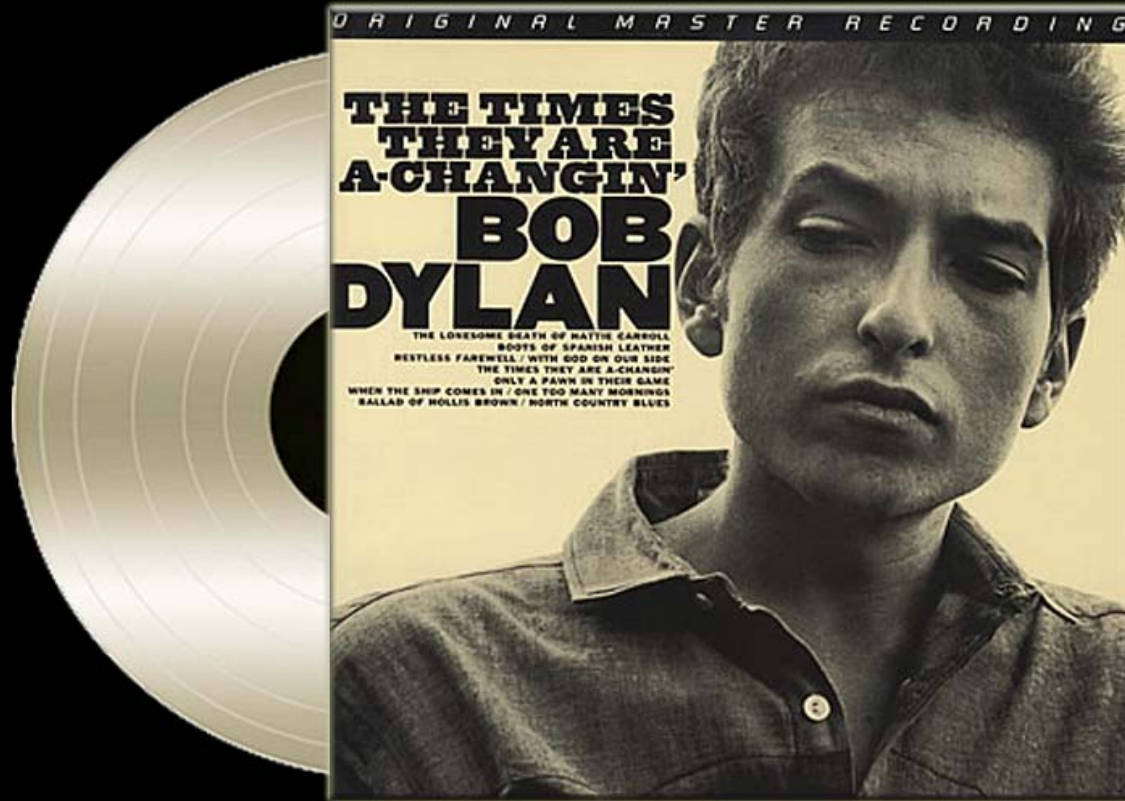
Framing Reinsurance In "Capital" Vernacular



Summary

- ERM is the foundation to capital modeling
- Managing capital leads to value creation
 - Capital Adequacy
 - Capital Allocation
 - Cost of Capital
- Insurers are at the early stages of capital modeling
 - Reinsurance analysis
- In time, capital models will drive many strategic decision
 - Growth strategy
 - Mergers and acquisitions
 - Compensation schemes
- It is an empirical exercise AND a behavioral exercise

For These Times They Are A Changing



Bob Dylan

GUY CARPENTER

ERM: Issues and Applications

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