MANAGING CAT RISK: IT'S ALL ABOUT THE PORTFOLIO

Taming Cats: Managing Natural and Man-Made Catastrophe Risks
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Polling Question

Why did you come to this session and what are you hoping to get out of it?

Perceived Risks …

"We were seeing things that were 25-standard deviation events, several days in a row."

Soon to be retired Goldman Sachs CFO David Viniar on his characterization of the 2007 financial crisis.

Translation: things were happening in August 2007 then that were only supposed to happen about once in every 100,000 years.

Perceived Risks … Past Financial & Insurance Crises

Within the U.S. (Financial)

1. 2001: Dotcom bust
2. 1998: Long Term Capital crash (Black-Scholes, leverage ratio of 250-to-1)
3. 1987: Stock market crash (Monday, October 19, 1987) where DJIA lost 22.6%

Within the U.S. (P&C Industry)

1. 2005: Katrina, Rita, Wilma … Dennis, Emily
2. 2004: Charley, Frances, Ivan, Jeanne, Bonnie

Per Gordon Gekko, “Greed is Good”! … Or is it?

Modeling Risks

Human nature is to respond to most recent events and not to what has not happened in a long, long time (or yet to occur). Japan Quake followed by Tsunami (Ring of Fire). Contrast California Quake vs Northeast Quake or New Madrid Quake.

Catastrophe models are continually evolving (Cat costs have increased significantly from last year due to model changes).

Copulas have been used by some to model tail risks. Parameter uncertainty has been quantified by some. But perhaps not to the extent that they should?

Does the Tail Wag the Dog (large Cat events are not only driving up PMLs, they are dictating AALs as well).

At the end of the day, modeling still relies on assumptions and each year we will be told the extent to which we were wrong. What do you believe in?

Capital Asset Pricing Model

$E(R_i) = R_f + B_i * (E(R_m) - R_f)$

Expected return on Asset = Risk free rate + Sensitivity of Asset * (Expected return on Market – Risk free rate)

Are you diversified? Would need 12-18 stocks but …

Are they in different industries? (Cat portfolio equivalent is geographic spread)

Are they Large Caps or Small Caps? (Cat portfolio equivalent is account size)

And you would still be subject to market risk! Would your enterprise be able to survive a 50% capital hit before going into receivership?

Our focus is on solvency throughout the insurance (& financial) cycle via prudent risk management of the portfolio. (Financial equivalent of Asset Allocation)

Mitigating Concentration Risks

- Geographic spread
- Peril spread (large vs “small” Cats as well)
- Industry diversification
- Line size management
- Lines of business that are not Cat exposed
- Account size management
- Hedging (Industry Loss Warranty, Reinsurance)

Risk Taxonomy - Example

Carnegie Mellon
Software Engineering Institute

Development Taxonomy

A. Product Engineering

1. Requirements
   - a. Stability
   - b. Completeness
   - c. Clarity
   - d. Validity
   - e. Feasibility
   - f. Precedent
   - g. Scale
2. Design
   - a. Functionality
   - b. Difficulty
   - c. Interfaces
   - d. Performance
   - e. Testability
   - f. Hardware Constraints
   - g. Non-Developmental Software
3. Code and Unit Test
   - a. Feasibility
   - b. Testing
   - c. Coding/Implementation
4. Integration and Test
   - a. Environment
   - b. Product
   - c. System
5. Engineering Specialties
   - a. Maintainability
   - b. Reliability
   - c. Safety
   - d. Security
   - e. Human Factors
   - f. Specifications

B. Development Environment

1. Development Process
   - a. Formality
   - b. Suitability
   - c. Process Control
   - d. Familiarity
   - e. Product Control
2. Development System
   - a. Capacity
   - b. Suitability
   - c. Usability
   - d. Familiarity
   - e. Reliability
   - f. System Support
   - g. Deliverability
3. Management Process
   - a. Planning
   - b. Project Organization
   - c. Management Experience
   - d. Program Interfaces
4. Management Methods
   - a. Monitoring
   - b. Personnel Management
   - c. Quality Assurance
   - d. Configuration Management
5. Work Environment
   - a. Quality Attitude
   - b. Cooperation
   - c. Communication
   - d. Morale

C. Program Constraints

1. Resources
   - a. Schedule
   - b. Staff
   - c. Budget
   - d. Facilities
2. Contract
   - a. Type of Contract
   - b. Restrictions
   - c. Dependencies
3. Program Interfaces
   - a. Customer
   - b. Associate Contractors
   - c. Subcontractors
   - d. Prime Contractor
   - e. Corporate Management
   - f. Vendors
   - g. Politics

Is there consistency in risk definition across the enterprise?
Is there consistency in risk quantification across the enterprise?
Is there consistency in aggregation methods/definitions across the enterprise?

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