

CRO Panel: A Day in the Life



Today's panel

Stephen Lowe

**Senior Consultant
Towers Watson**

Michael Mahaffey

**Senior VP & Chief Risk Officer
Nationwide**

Robert Rupp

**Executive VP & Chief Risk Officer
The Hartford**

Alessandra Quane

**Chief Risk Officer, Property Casualty
AIG**

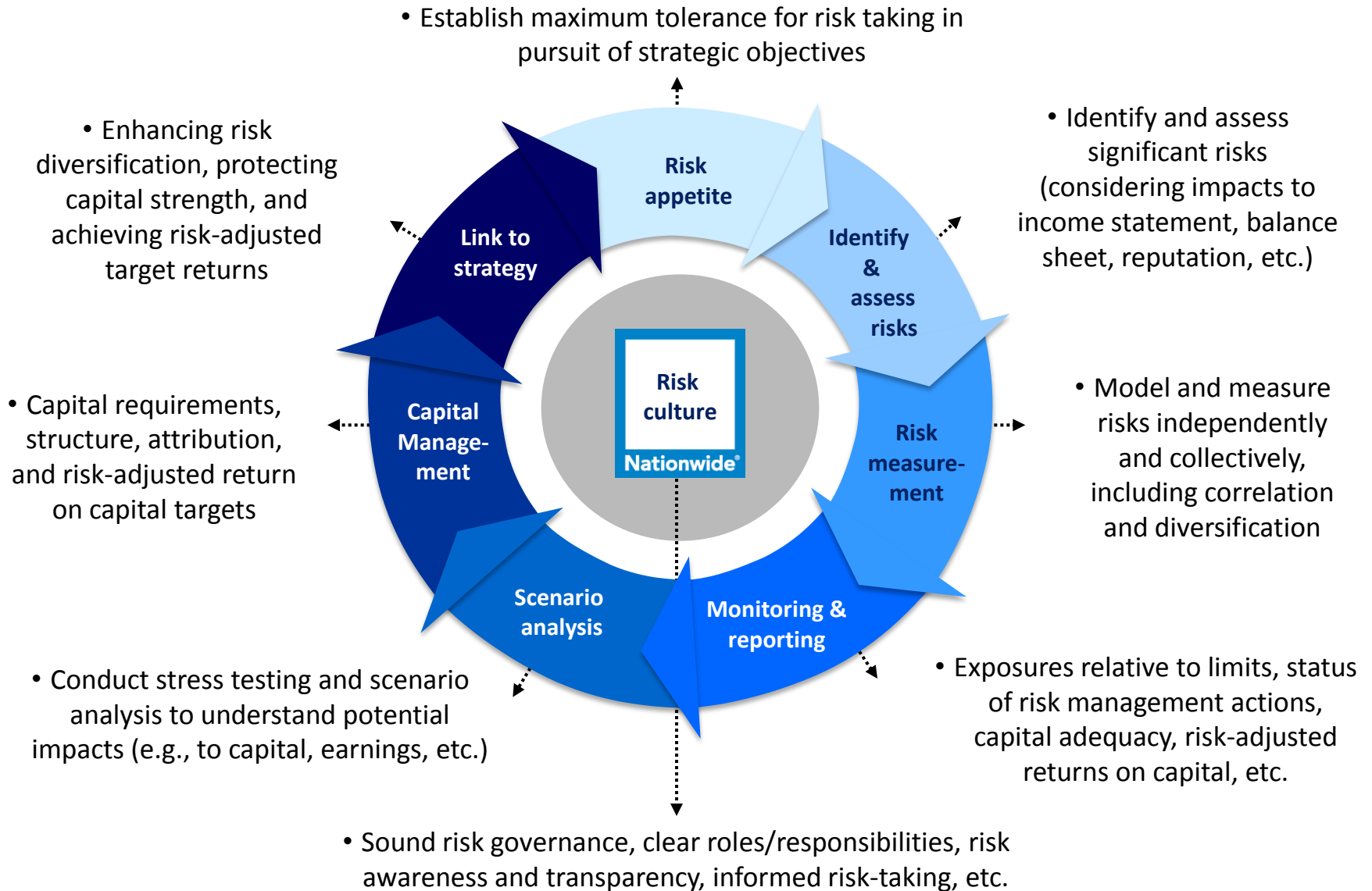


Nationwide®
On Your Side

Risk Governance and Organization

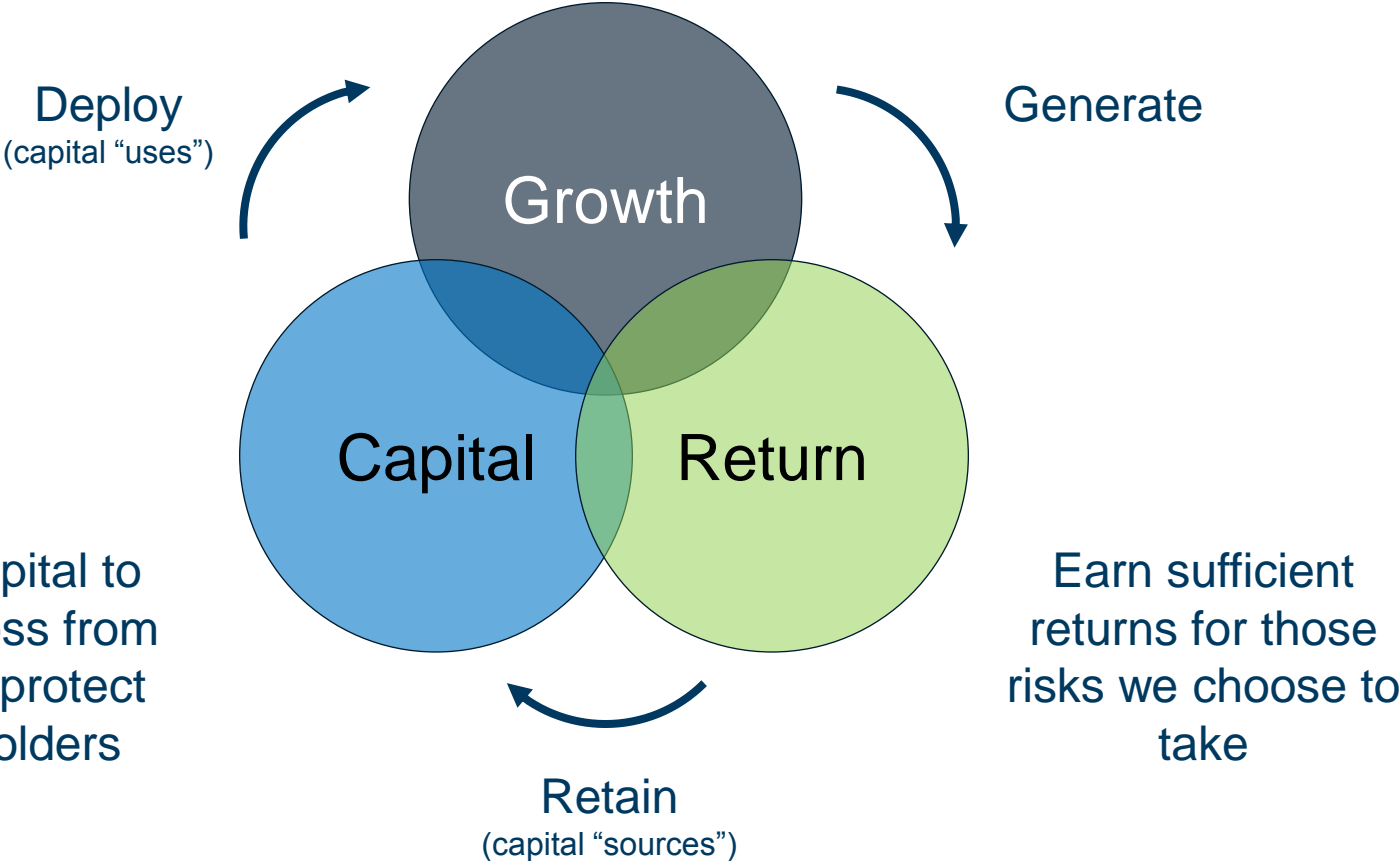
Mike Mahaffey

Enterprise Risk & Capital Management Framework



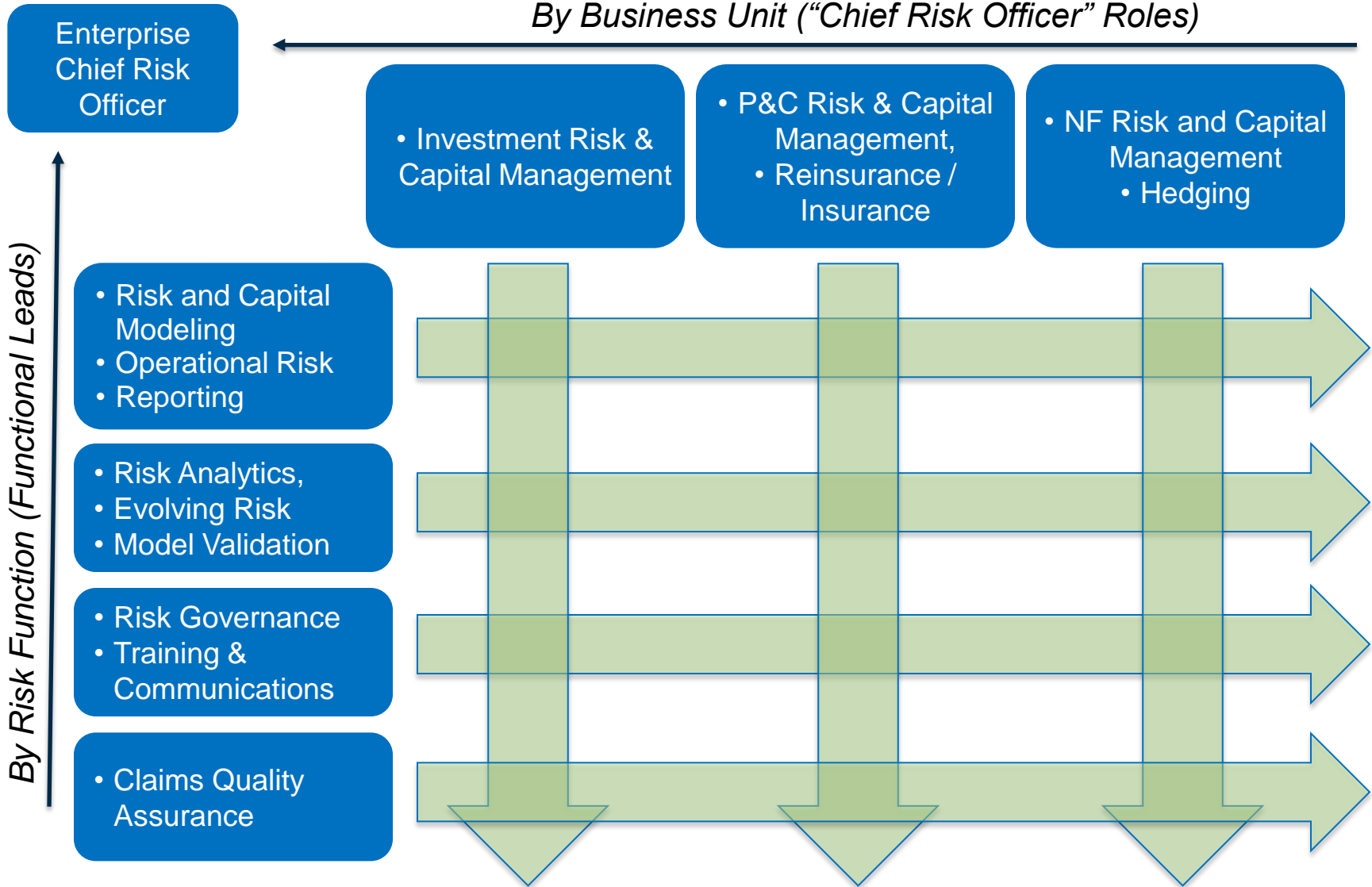
Balancing Growth, Returns, and Capital

Serve more people, with more products and services (take more risk)



ERCM Organization

By Business Unit ("Chief Risk Officer" Roles)





Market Risk, Cyber Risk

Bob Rupp

Fundamentals of Risk Management

KNOWLEDGE

“ Our inability to pinpoint a number doesn't bother us: **We would rather be approximately right than precisely wrong.** ”

— Warren Buffett

“SCIENCE” of Risk

“ART” of Risk

Business Knowledge

ACCOUNTABILITY

“ Risk Masters transform risk management **from a reactive protector to a proactive enabler.** ”

— Accenture

“DEFENSE”

Loss Avoidance

“OFFENSE”

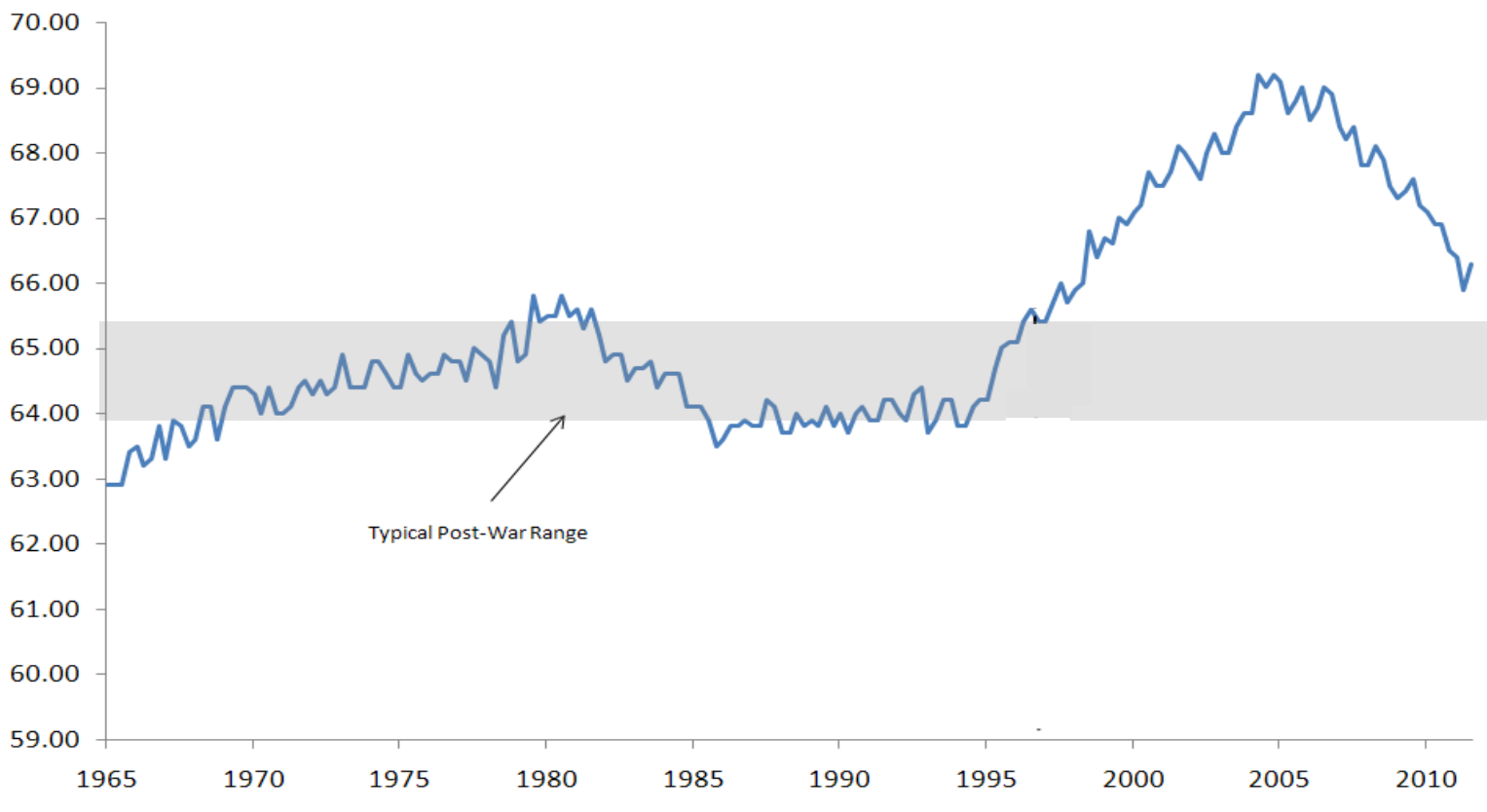
Profit Generation

**Maximize
Shareholder Value**

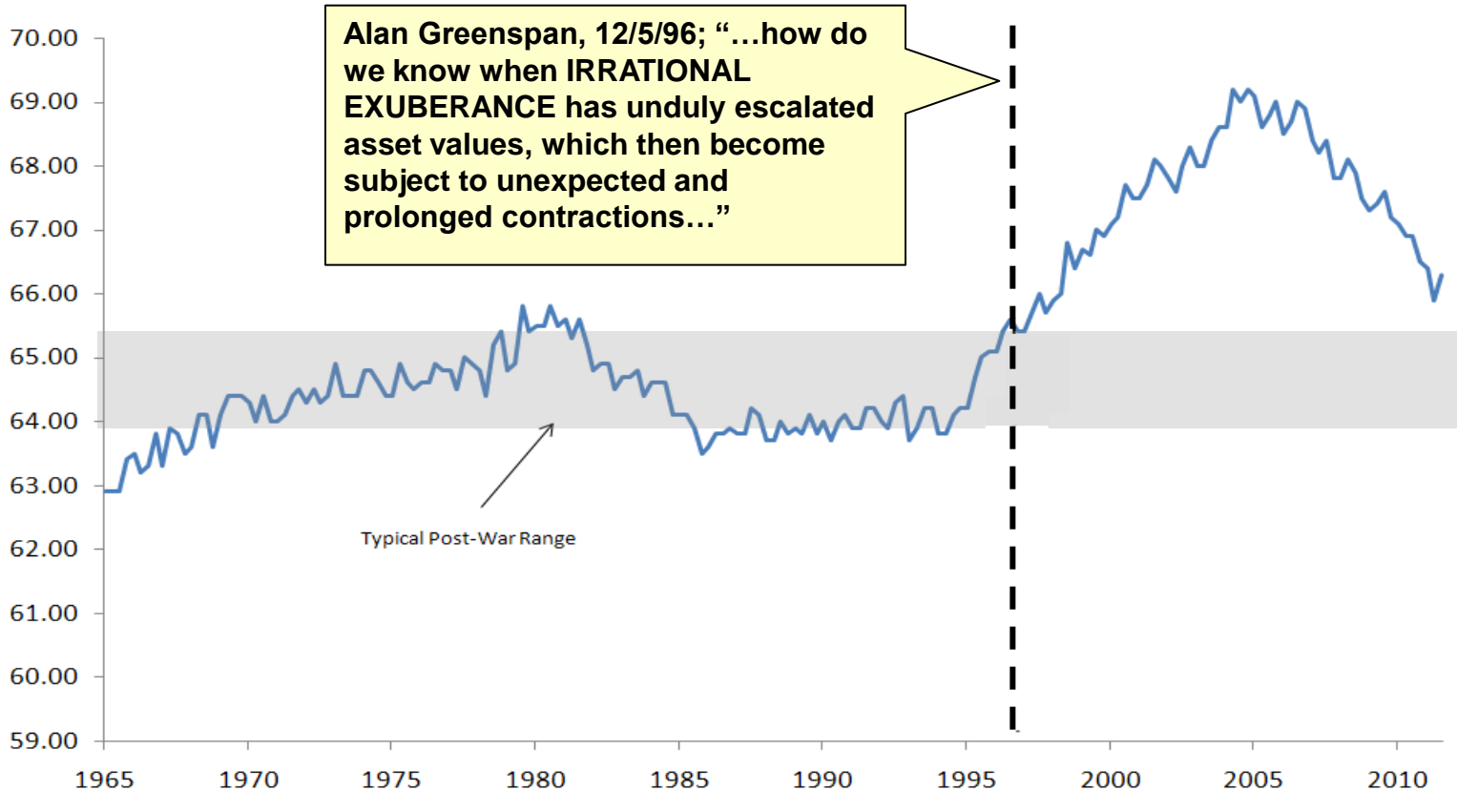


Market Risk: Credit Crisis

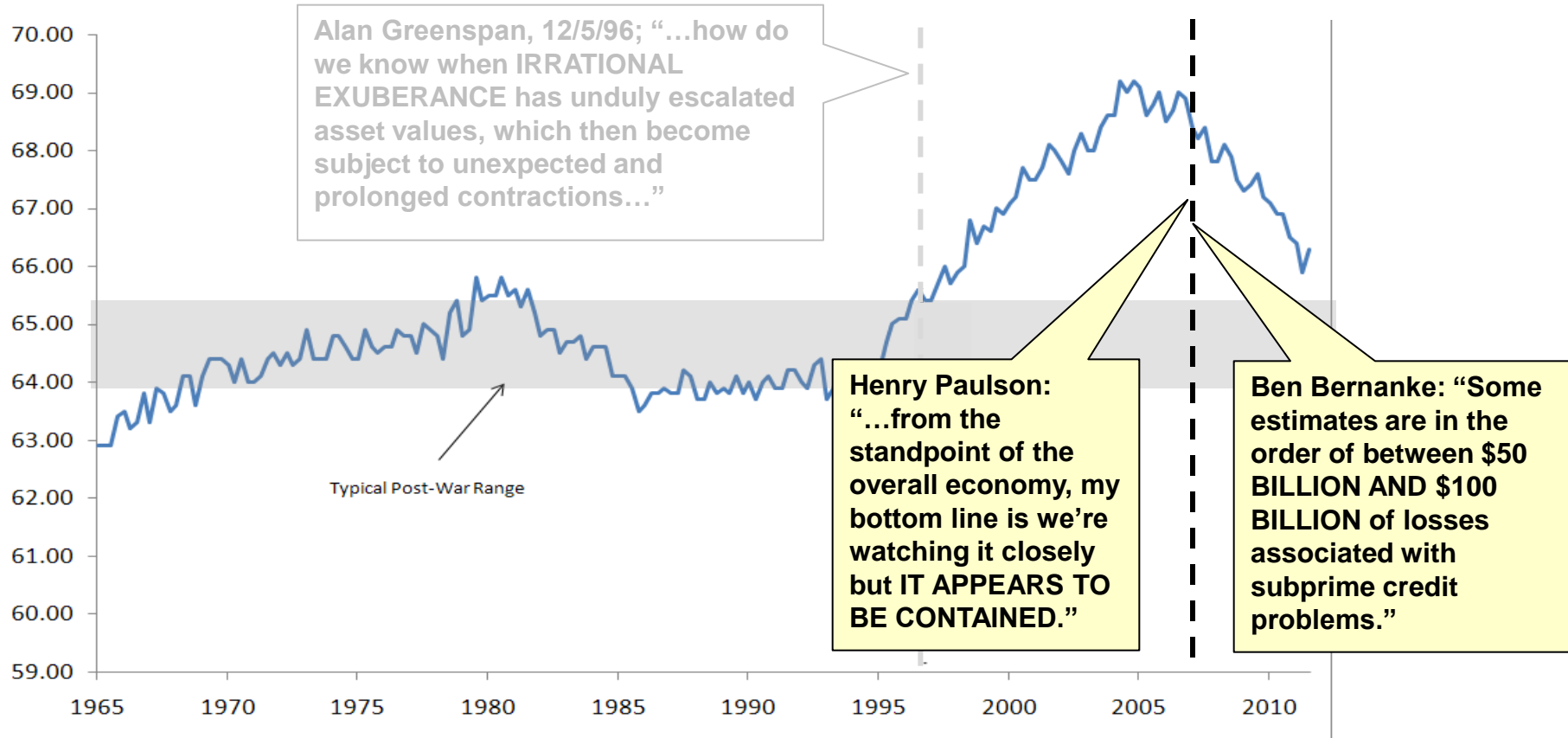
Home Ownership Rate



Alan Greenspan: 1996



Bernanke/Paulson: 2007



Financial Crisis

Between October 2007 and March 2009,
6 of the 10 largest publicly listed VA issuers in the U.S.
lost about 90% of their market capitalization.

Credit Crisis Losses

Banks / Brokers \$1.52 Trillion

Insurers \$231 Billion

Fannie Mae \$180 Billion

Freddie Mac \$139 Billion

Worldwide Financial
Institutions

\$2.07 Trillion



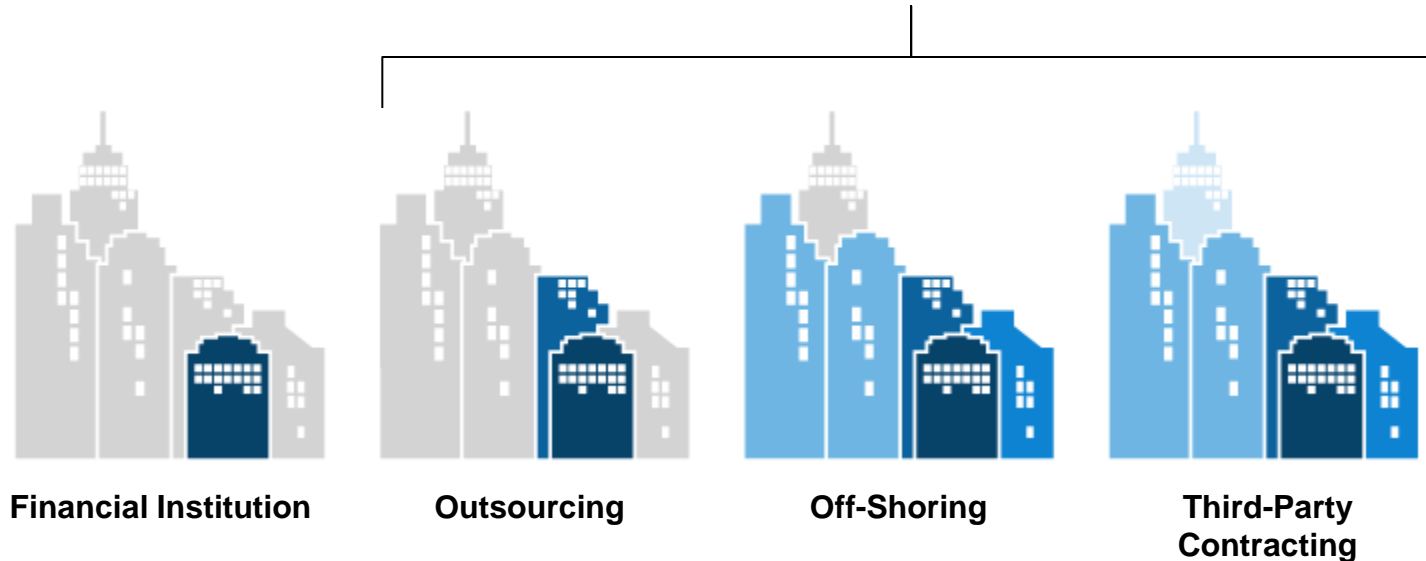
Cyber Risks

Industry Perspective

Attack Surface is Larger



Diluted institutional control over IT systems and access points offers an increased “attack surface” to exploit



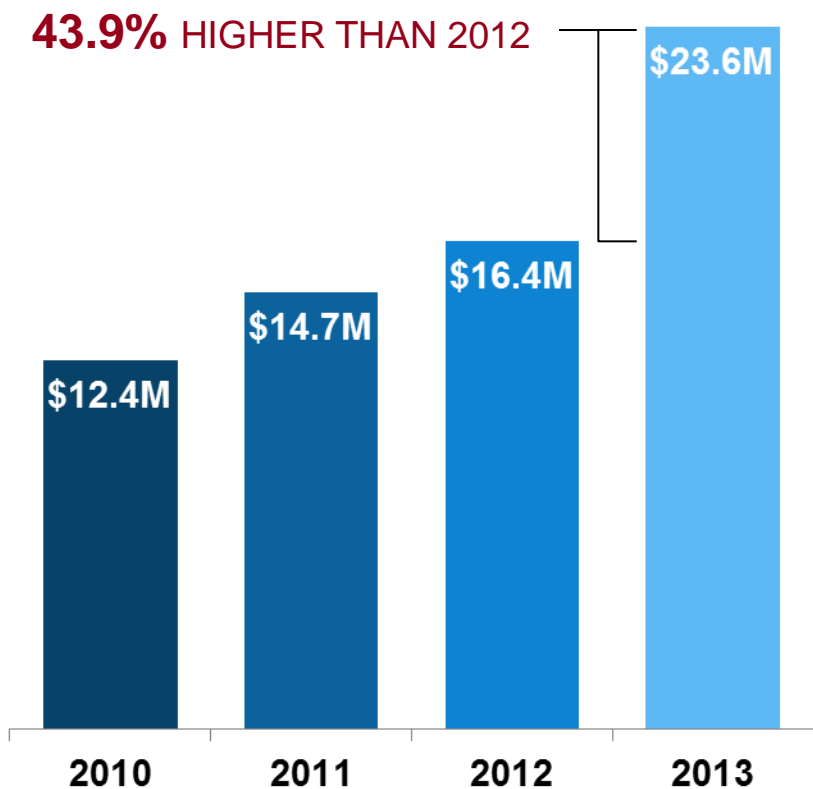
- Technology companies are seeing higher frequency and severity vs other Fortune 1000 industries*
- They are twice as concerned about outsourced vendor risk*
- Compelling fact, since they are the cyber vendors to the Fortune 1000*

Industry Perspective

Financial Services Industry: Cyber Risk



Average Annualized Cost of Cyber Crime for Financial Services Company



“The financial services industry topped the list of 26 different industries that cyber criminals most targeted.”

— “Not Your Average Cybercriminal: A Look at the Diverse Threats to the Financial Services Industry,” Mandiant, September 23, 2013.

“Financial services remains the industry most susceptible to malicious email traffickers, as consumers are seven times more likely to be the victims of an attack...”

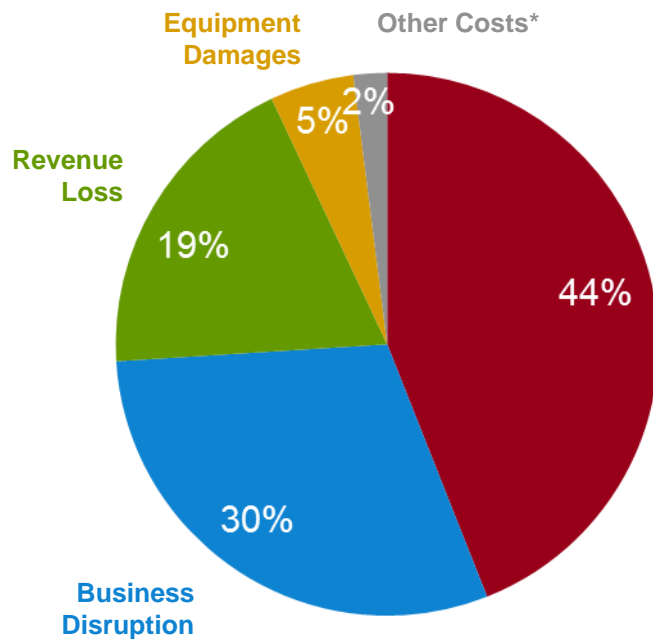
— “Agari Email Trust Index: 3rd Quarter Edition,” Agari, November 2013

“In 2011, the U.S. was the only region where cyber threat made it into the top five; by 2013, this is now region’s number two risk.”

— “Risk Index 2013”, Lloyd’s, July 10, 2013

Insurance Industry

Largest Segment of Client Losses: Stolen Information



Information Loss: National Statistics

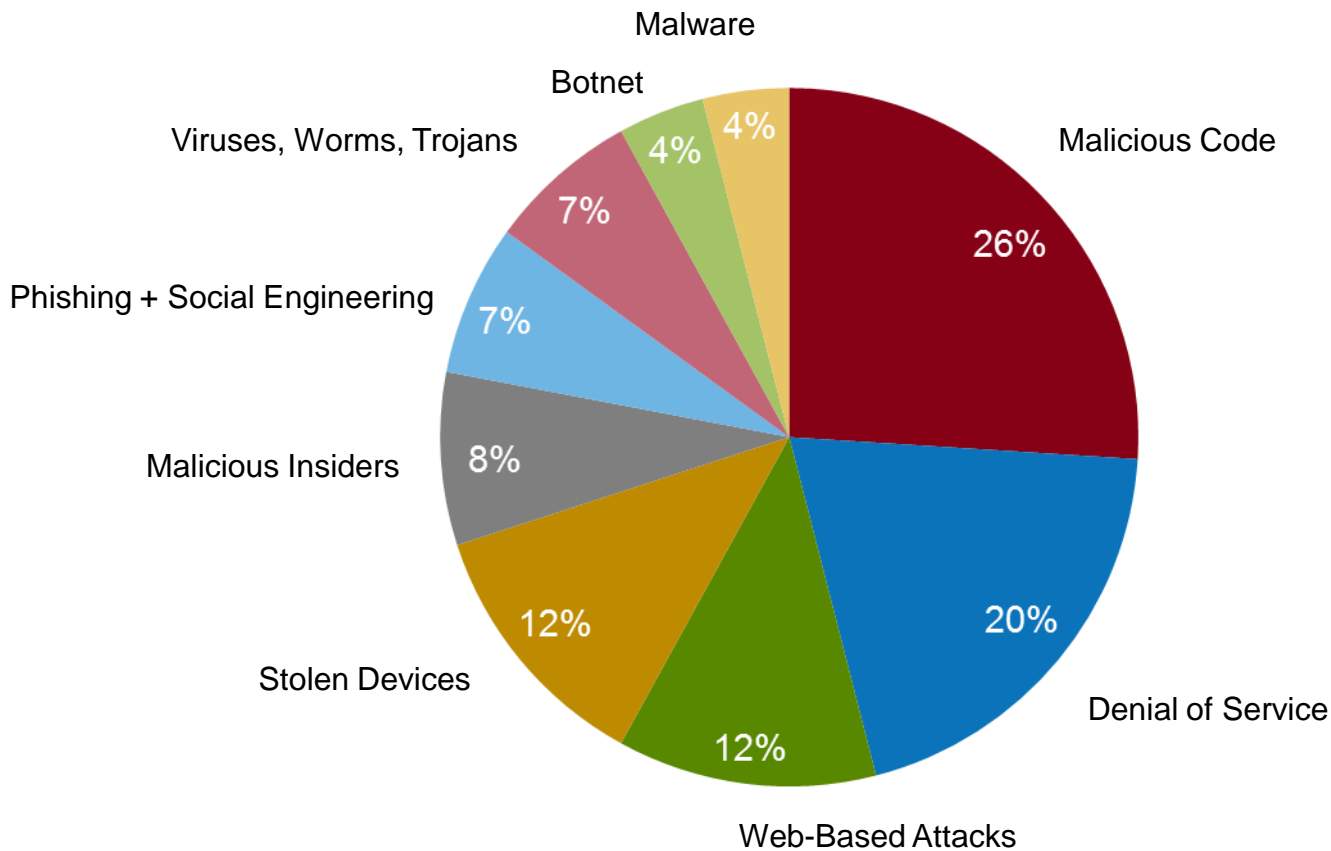
- Identity theft was the largest single consumer complaint category in 2013 (FTC, FBI)
- 7% of U.S. adults fell victim to identity loss, of these 22%, more than once
- Median loss > \$2,183 per individual
- Total U.S. cost \$24.7 billion

Industry Perspective

Forms of Attack



Malicious code, denial of service and web-based attacks account for more than 58 percent of the total annualized cost of cyber crime experienced by 56 companies*

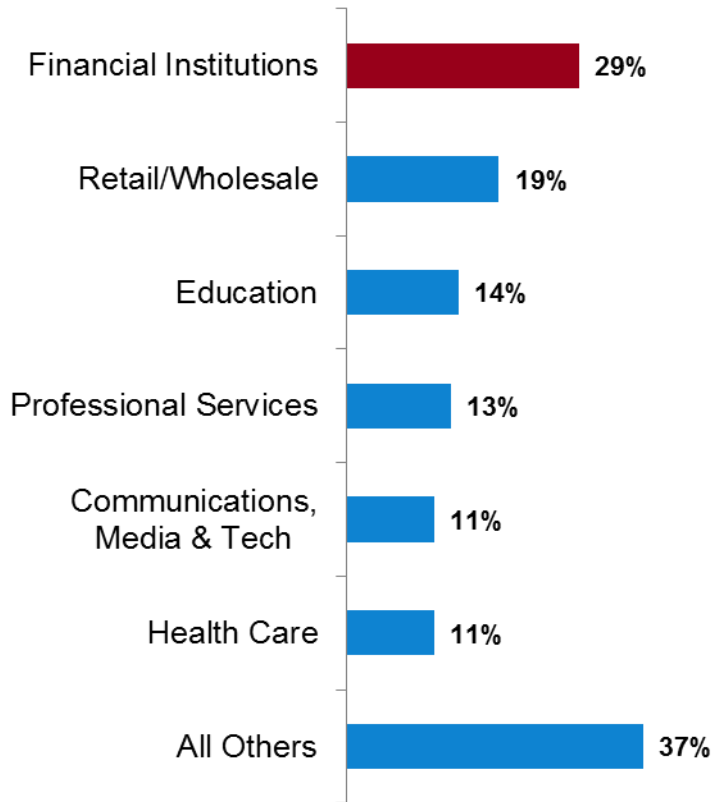


Industry Perspective

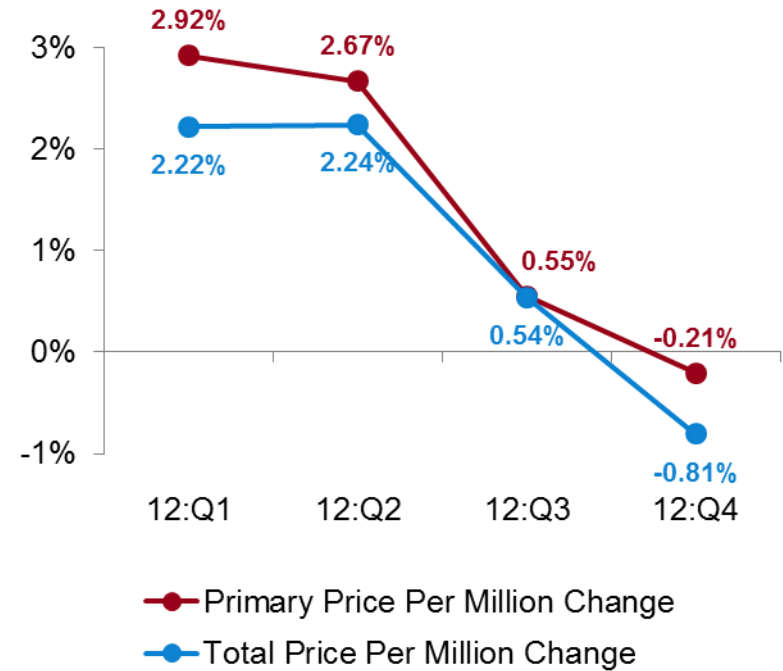
Cyber Insurance: Growth and Price



2013 Growth in Purchases of Cyber Insurance



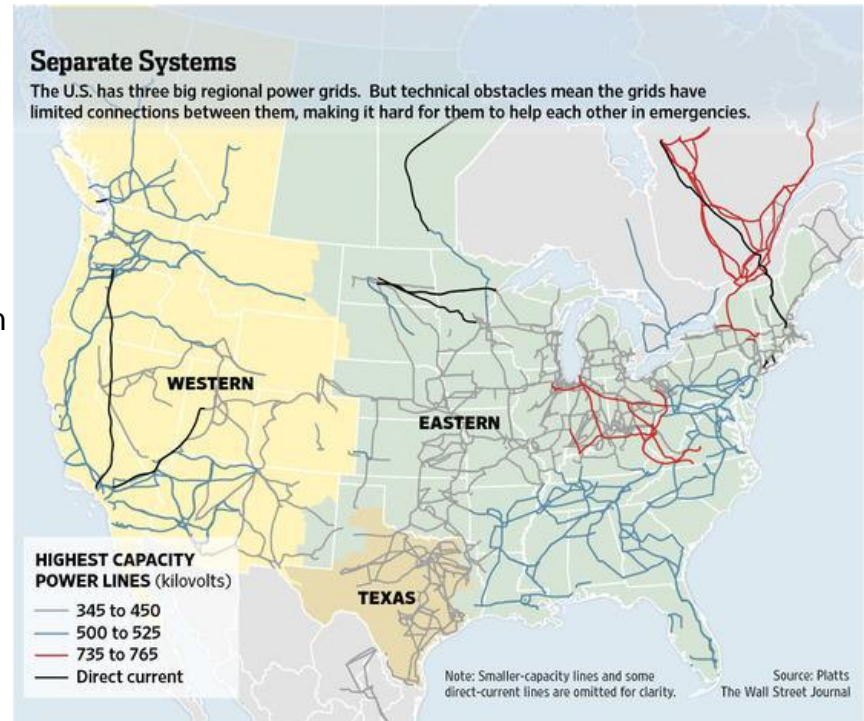
Cyber Liability Rate Changes (Price Per Million)



U.S. Risks National Blackout From Small-Scale Attack

Sabotage of 9 Key Substations Is Sufficient for Broad Outage

- A study by the Federal Energy Regulatory Commission concluded that coordinated attacks in each of the nation's three separate electric systems (East, West and Texas) could cause the entire power network to collapse
- "This would be an event of unprecedented proportions," said Ross Baldick, a professor of electrical engineering at the University of Texas at Austin
- A small number of the country's substations play an outsize role in keeping power flowing across large regions. The FERC analysis indicates that knocking out nine of those key substations (four in the East, three in the West and two in Texas) could plunge the country into darkness for weeks, if not months
- An outage could be up to 18 months, one reason being only a handful of U.S. factories build transformers
- Because it is difficult to build new transmission routes, existing big substations are becoming more crucial to handling electricity
- "The power grid, built over many decades in a benign environment, now faces a range of threats it was never designed to survive," said Paul Stockton, a former assistant secretary of defense and president of risk-assessment firm Cloud Peak Analytics



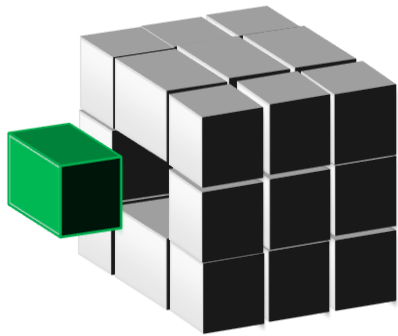


Risk Aggregation

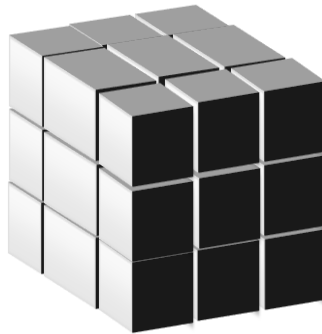
Alessandra Quane

Risk Measurement – Analysis Types

Scenario Driven Approach



- Start with a specific event and determine how it will affect the industry and insurer
- Set parameters for scenario footprint: geography, time period, industries impacted, insurance products / investments affected
- Use position-level details to determine aggregate risk exposure should the specified (or proximate) event occur



Data Driven Approach

- Start at the portfolio level and look for concentrations of risk that could be susceptible to an aggregate event
- Organize and assess data across different dimensions: industries, insureds, geographies, products, time periods
- Assess data across risk dimensions to determine *specific events or classes of events* that could impact the portfolio

Risk Aggregation – Overview

- Accumulation = when a single cause, event or factor produces effects on numerous positions (i.e. insurance policies, investments, company operations, etc.)
- Long-term objective: build an organized and comprehensive approach to measuring/ aggregating risk
- Short-term actions: design a set of processes, analyses, and systems to better understand exposure accumulation / loss potential from individual events or forces
- Broadest possible scope
 - All risk types, regions, divisions, profit centers, lines of business, products, positions
- Multiple methods / approaches based on purpose / use
 - Probabilistic actuarial modeling (regressions, copulas, simulation)
 - Deterministic scenario modeling (factors applied to granular policy details)
- Analysis outputs inform key business decisions
 - General risk awareness – highlighting risks that matter most to profitability
 - Risk appetite – asking “how much is too much?” / informing structure and size of explicit limits
 - Contract structuring – highlighting potential structural mitigants of loss
 - Performance measurement / pricing – calculating risk-adjusted performance
 - Capital modeling – testing model assumptions and providing estimates for non-modeled cases
- Key challenges
 - Data – quality, completeness, availability, timeliness
 - Coordination – cross-departmental communication / execution
 - Assumptions / Calibration – likelihood, impact, correlation, diversification

Considerations of an Aggregation Framework

Cross-functional Working Group

Risk Identification

- Subject Matter Expert Interviews
- Claims Trend Analysis
- Environmental Scanning / Lit Review
- External Forums (CRO / ISO Forum)
- Third party partners

Risk Prioritization

- Materiality
- Return Period / Probability
- Complexity
- Diversity
- Claims Activity
- Payout Pattern
- Action-ability

Risk Measurement

- Deterministic or Stochastic Scenarios
- Dimensional / Concentration Analysis
- Exposure Tracking
- Sensitivity Analysis

Risk Reporting

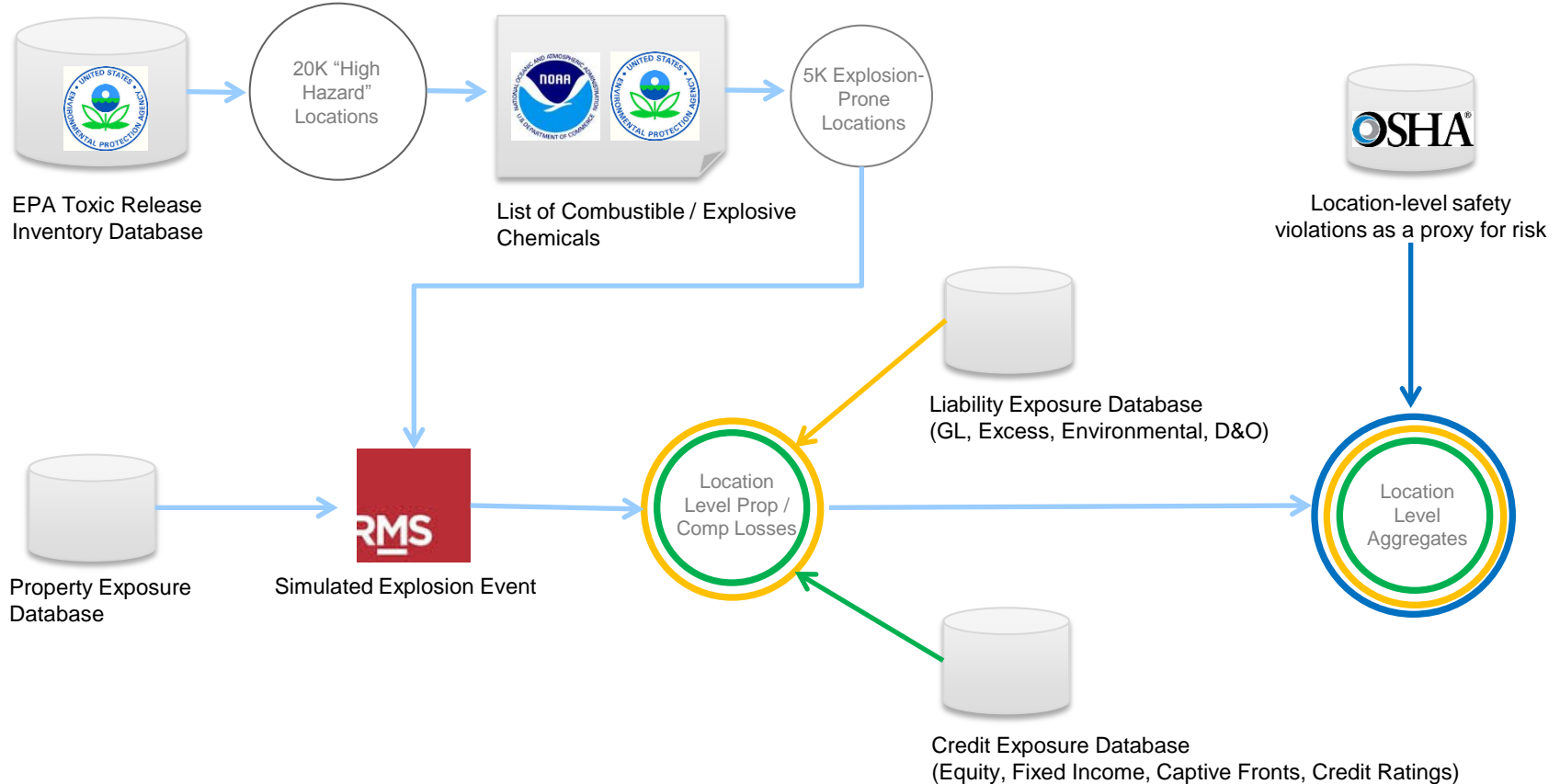
- Issue Briefs / Exec. Claim Summary
- Ad-hoc Quantitative Reports
- Exposure Tracking Reports
- Dashboards
- Key Risk Indicator Exhibits
- Supporting Research Documents

Strategy

- Risk Appetite and Limits
- Underwriting Guidance
- Pricing / Reserving
- Capital and Resource Planning
- Reinsurance

Risk Committee

Aggregation Case Study – Industrial Explosion



- Purpose: understand aggregate cross-LOB exposure to “high hazard” industrial facilities in the US
- Examples: West Fertilizer Plant (2013), BP Deepwater Horizon (2010), Phillips 66 Polyethylene Plant (1989)
- Analysis approach: connect external Environmental Protection Agency (EPA) high hazard location data with property, work comp, liability, environmental, D&O and credit data

Discussion

Own Risk and Solvency Assessment

- How is the NAIC's ORSA pilot going?
- Any lessons learned from implementation steps taken thus far?
- Reactions to ORSA from the Board?
- Key issues or obstacles?
- Integration of NAIC requirement with IAIS global requirements?
- FIO?

North American CRO Council

- What are current activities, and plans for 2014?
- What is the Council doing on ComFrame and other regulatory developments?
- What research is the Council undertaking and publishing?

Risk Management Talent

- **As a CRO, what types of skills are you looking for to fill roles within the risk function?**
- **What skills are in short supply?**
- **What skills do actuaries need to add to expand their contribution?**
- **If I aspire to be a CRO myself, what skills are most critical to my success?**

Other Questions?

Thank You!

