

Planning for NAIC ORSA



Agenda

- ◆ Introduction
- ◆ NAIC ORSA Overview
- ◆ Qualitative vs. Quantitative Analysis
- ◆ Deterministic vs. Stochastic Approaches
- ◆ Top-down vs. Bottom-up Approaches
- ◆ Modeling Risk Correlations
- ◆ Conclusion
- ◆ Q&A

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Your Presenters



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NAIC ORSA Overview

- ◆ ORSA = Own Risk and Solvency Assessment
 - ❖ NAIC Model Law adopted in September 2012
 - ❖ NAIC Guidance Manual revised March 2013
 - ❖ Effective date: January 1, 2015

- ◆ A new regulatory requirement intended to:
 - ❖ Foster effective enterprise risk management
 - ❖ Provide a group level perspective on risk and capital

- ◆ Required of:
 - ❖ Companies with gross written premium over \$500 million
 - ❖ Groups with gross written premium over \$1 billion
 - ❖ Other entities in special circumstances (e.g., financial distress)

NAIC ORSA Model Act

Risk Management Framework

“...maintain a risk management framework to assist the insurer with identifying, assessing, monitoring, managing and reporting on its material and relevant risks.”

ORSA Requirement

“...a confidential internal assessment...of the material and relevant risks associated with the insurer or insurance group’s current business plan, and the sufficiency of capital resources to support those risks.”

ORSA Summary Report

“...a confidential high-level summary of an insurer or insurance group’s ORSA.”

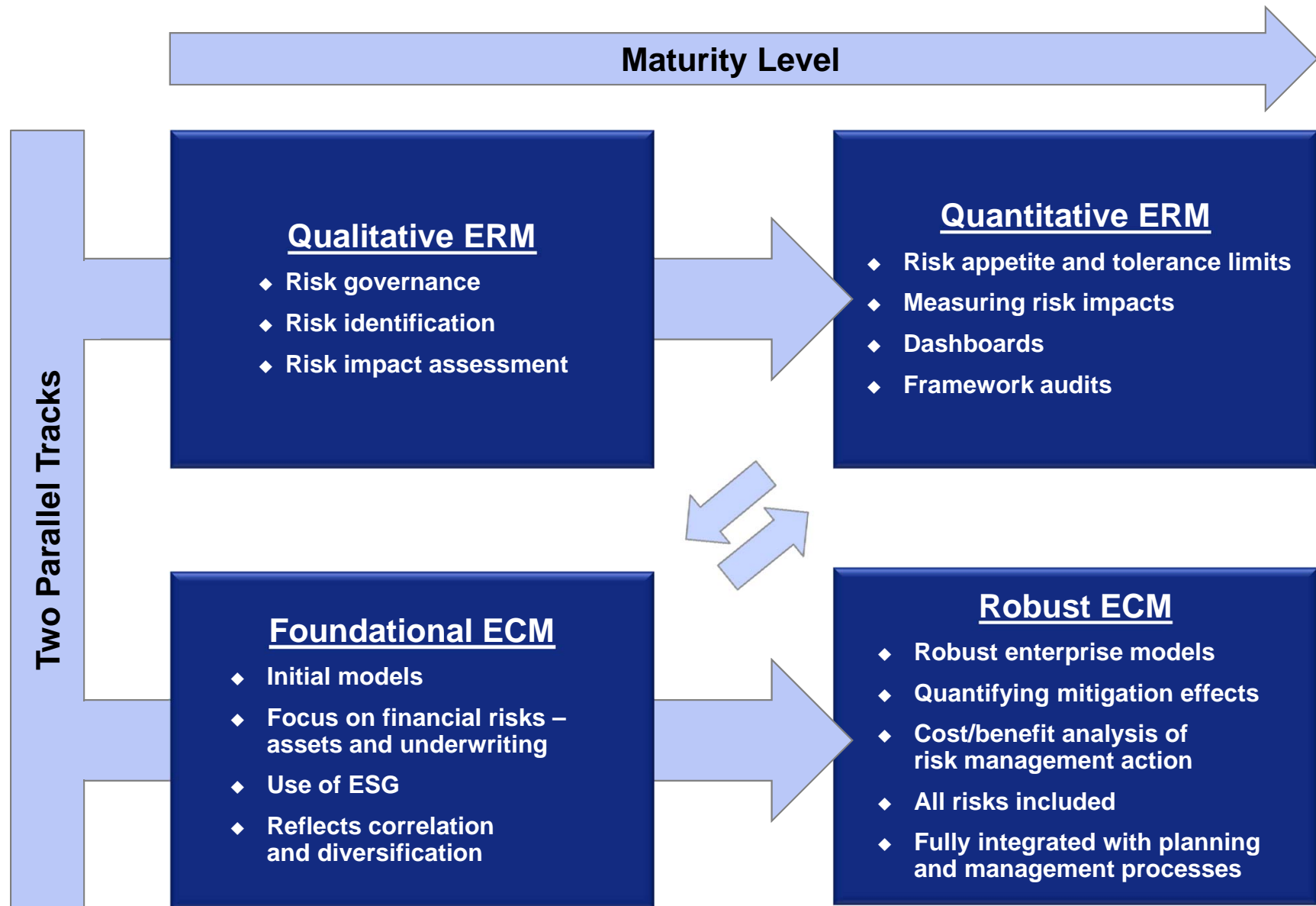
NAIC ORSA Summary Report

- ◆ The ORSA Summary Report has three main sections:
 1. Description of the Insurer's Risk Management Framework — Enterprise Risk Management ("ERM")
 2. Insurer's Assessment of Risk Exposure
 3. Group Risk Capital and Prospective Solvency Assessment
- } Economic Capital Modeling ("ECM")
- ◆ Approach to ECM depends on the nature and complexity of the risks, the company's financial position and considerations related to the economic environment but should include:
 - ❖ Stress testing
 - ❖ Stochastic simulation models

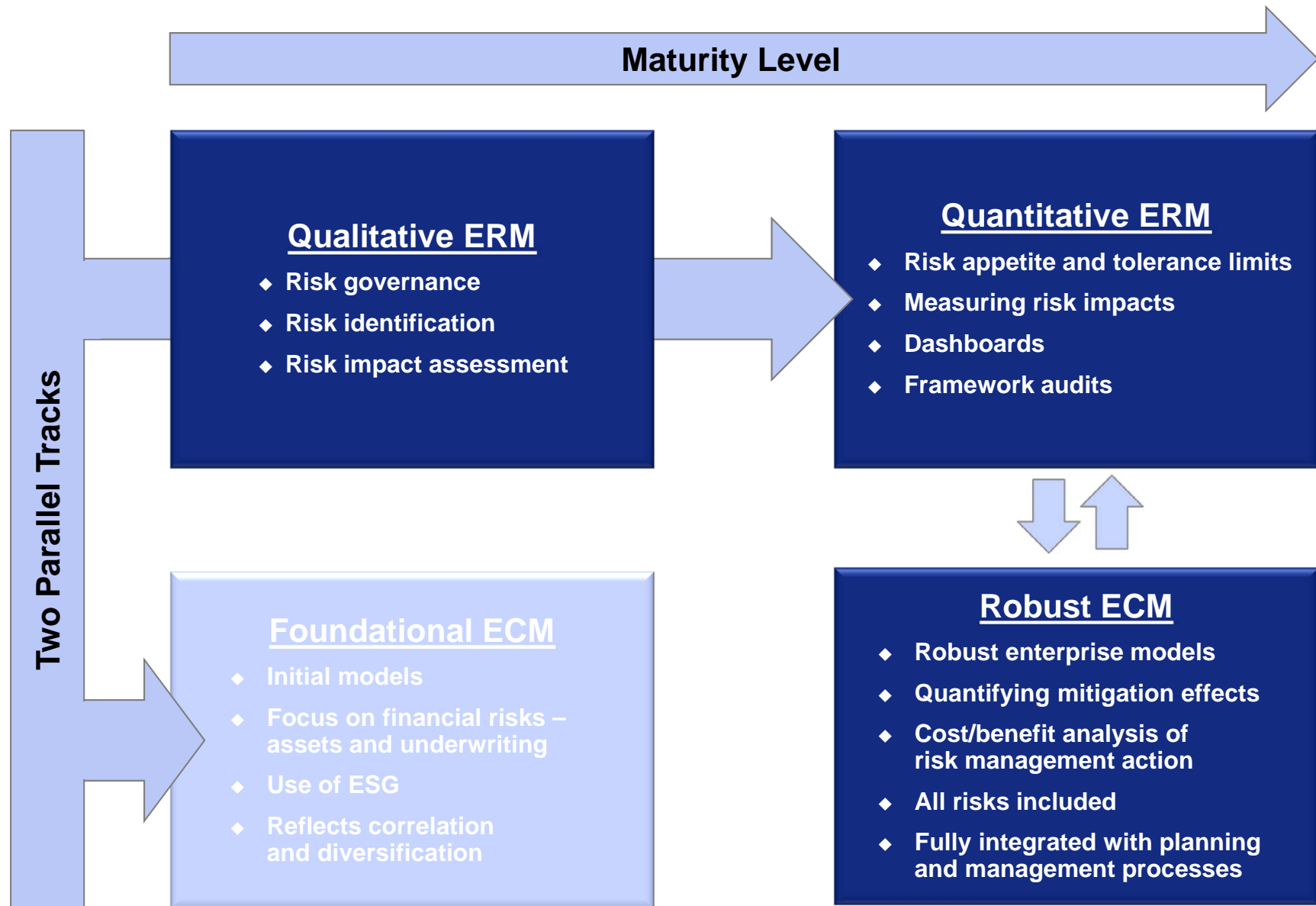
Risk Management Framework – Key Principles

- ◆ Risk culture and governance
- ◆ Risk identification and prioritization
- ◆ Risk appetite, tolerances and limits
- ◆ Risk management and controls
- ◆ Risk reporting and communication

ERM/ECM Growth Paths



ERM/ECM Relationships in a Mature Process



Insurer Assessment of Risk Exposures

- ◆ All Relevant Categories of Risk Must Be Addressed

“Examples of relevant material risk categories may include, but are not limited to, credit, market, liquidity, underwriting, and operational risks.”

- ◆ Normal and Stress Conditions must be Reflected

“...quantitative and/or qualitative assessments of the risk exposure in both normal and stressed environments for each material risk category...”

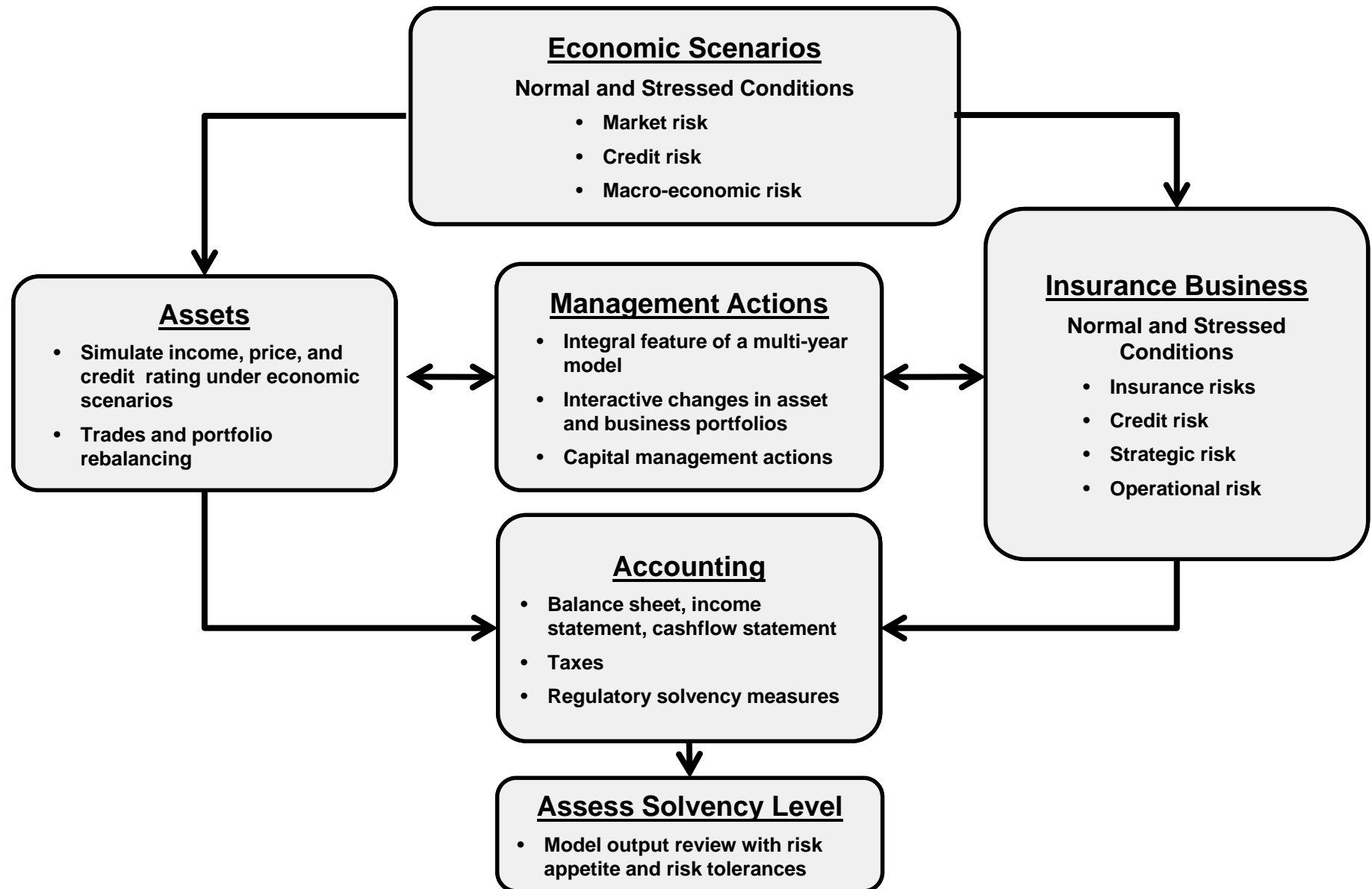
- ◆ Should Review Impact on Financial Statements

“...each insurer’s quantitative methods for assessing risk may vary; however, insurers generally consider the likelihood and impact that each material and relevant risk identified by the insurer will have on the firm’s balance sheet, income statement and future cash flows.”

- ◆ Should Recognize Unique Risk Profiles and Stress Conditions

“Because the risk profile of each insurer is unique, each insurer should utilize assessment techniques (e.g., stress tests, etc.) applicable to its risk profile. U. S. insurance regulators do not believe there is a standard set of stress conditions that each insurer should test.”

Economic Capital Model (ECM) Simulation Architecture



An Approach to “Non-quantifiable” Risks

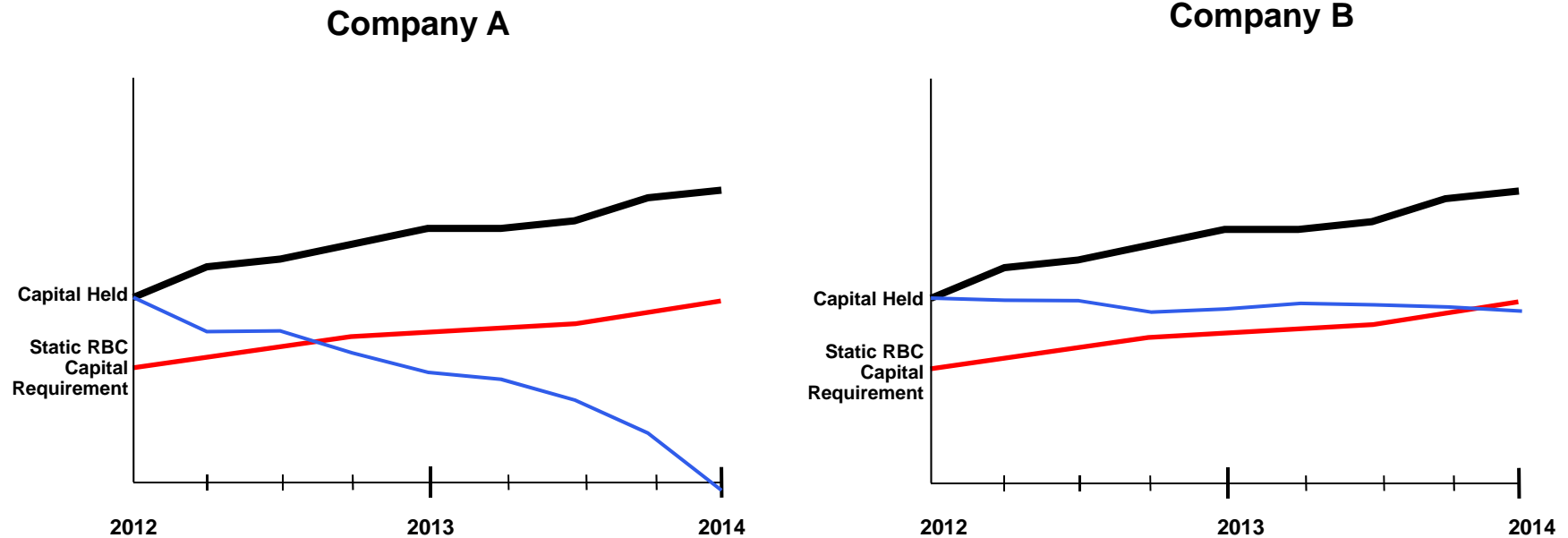
Example: Regulatory Risk—the risk to earnings, capital and reputation arising from changes in regulations or failure to comply with regulations

1. Identify causal sources of regulatory uncertainty through focused interviews with business managers. Examples: new government mandates on pricing and profit levels and possible retroactive expansion of insurance coverage.
2. Discuss and create scenarios of how neutral, favorable, and adverse regulatory outcomes would affect the insurance business. A key facet of this is understanding the “timing” of the risk occurrence (regulatory ruling) with the future financial impact on the organization’s financials.
3. Design and implement the cause-and-effect process into the economic capital model. An insightful risk assessment does not really need complex modeling and should be fully explainable back to the business management.

Stress and Stochastic Modeling Approaches

- ◆ ORSA Guidance Manual suggests usage of both stress testing approaches and stochastic risk modeling approaches
- ◆ Each has distinct pros and cons
- ◆ A robust analysis will employ both

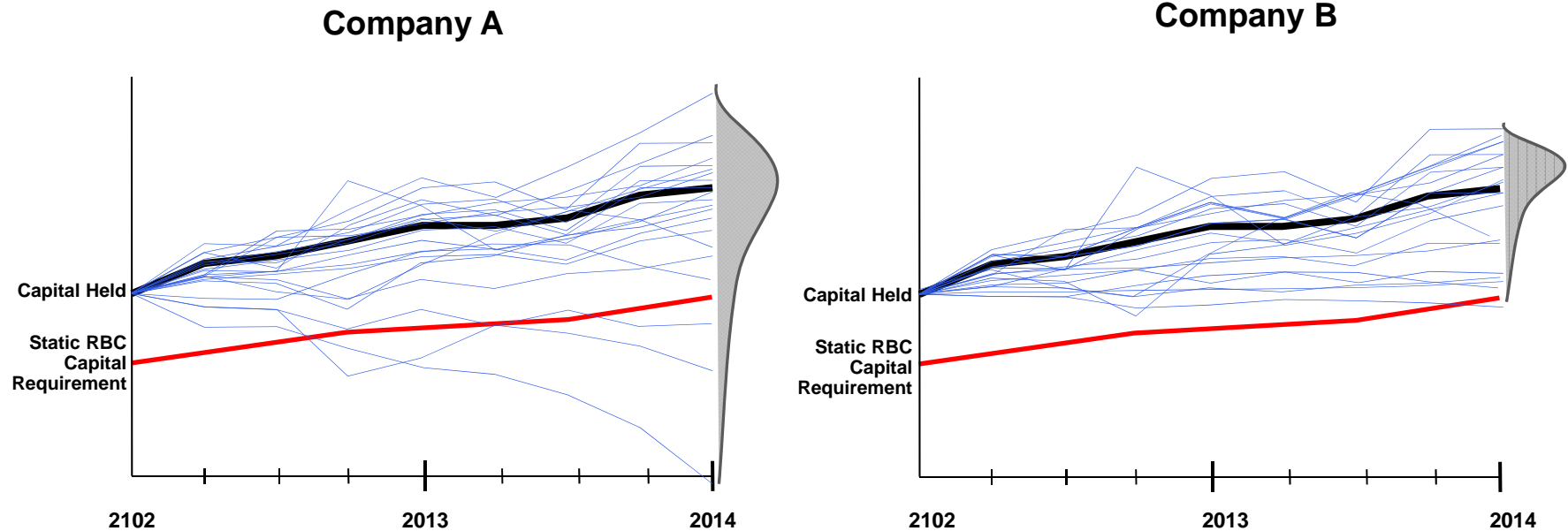
Stress Test Modeling



- ◆ Two companies, same balance sheet and mean growth forecast → same capital requirement under standard RBC formula, assuming everything plays out “as expected”
- ◆ Stress test model asks what happens under a single, specific alternative set of conditions (blue line), e.g., an adverse economic environment
- ◆ Company A has much greater potential for upside and downside variation → greater need for capital to remain above minimum thresholds

source: ADVISE® model

Stochastic Risk Modeling



- ◆ Two companies, same balance sheet and mean growth forecast → same capital requirement under standard RBC formula
- ◆ Stochastic risk model shows range of possible scenarios
- ◆ Company A has much greater potential for upside and downside variation → greater need for capital to remain above minimum thresholds

source: ADVISE® model

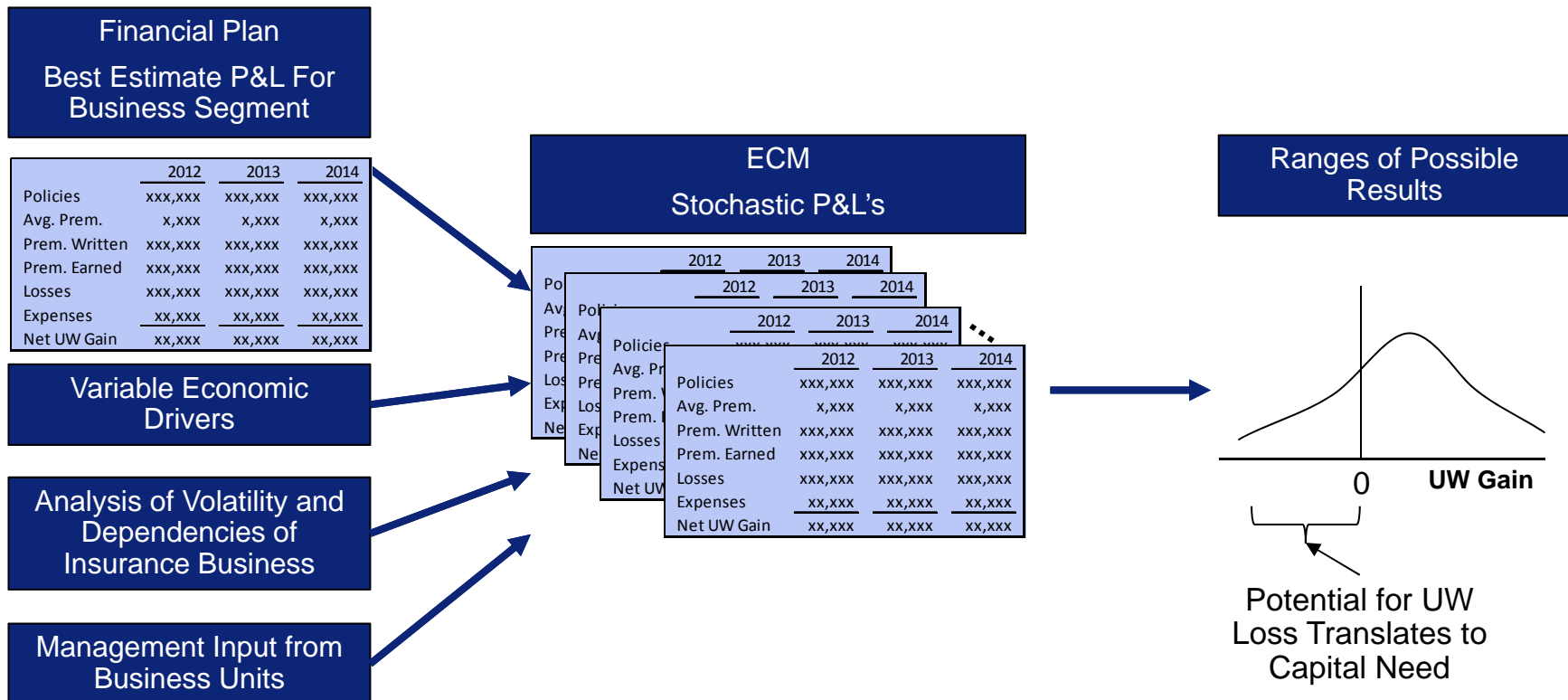
Deterministic (Stress Test) vs. Stochastic Models

	Advantages	Disadvantages
Deterministic Stress Tests <i>(single “what-if” scenarios)</i>	<ul style="list-style-type: none"> ◆ Easy to set up ◆ Can re-create actual historical events ◆ Simple structure – “what if” analysis (cause & effect) ◆ Easy to understand risk drivers and interpret & explain results 	<ul style="list-style-type: none"> ◆ Incomplete picture ◆ Scenarios may not truly reflect a sufficiently broad range of adverse circumstances ◆ Can’t make strategic decisions based solely upon the cause & effect of a single scenario
Stochastic Models <i>(up to thousands of scenarios processed simultaneously)</i>	<ul style="list-style-type: none"> ◆ More complete picture ◆ Range of results & probabilities reflected in distributions ◆ Better for making strategic decisions under uncertainty 	<ul style="list-style-type: none"> ◆ More difficult to parameterize – need to calibrate both body and tail of distribution ◆ Complex structure – thousands of scenarios run simultaneously ◆ May be more difficult to interpret & explain results

Best practice is to employ both approaches, and use a long historical data set, which includes historical stress events.

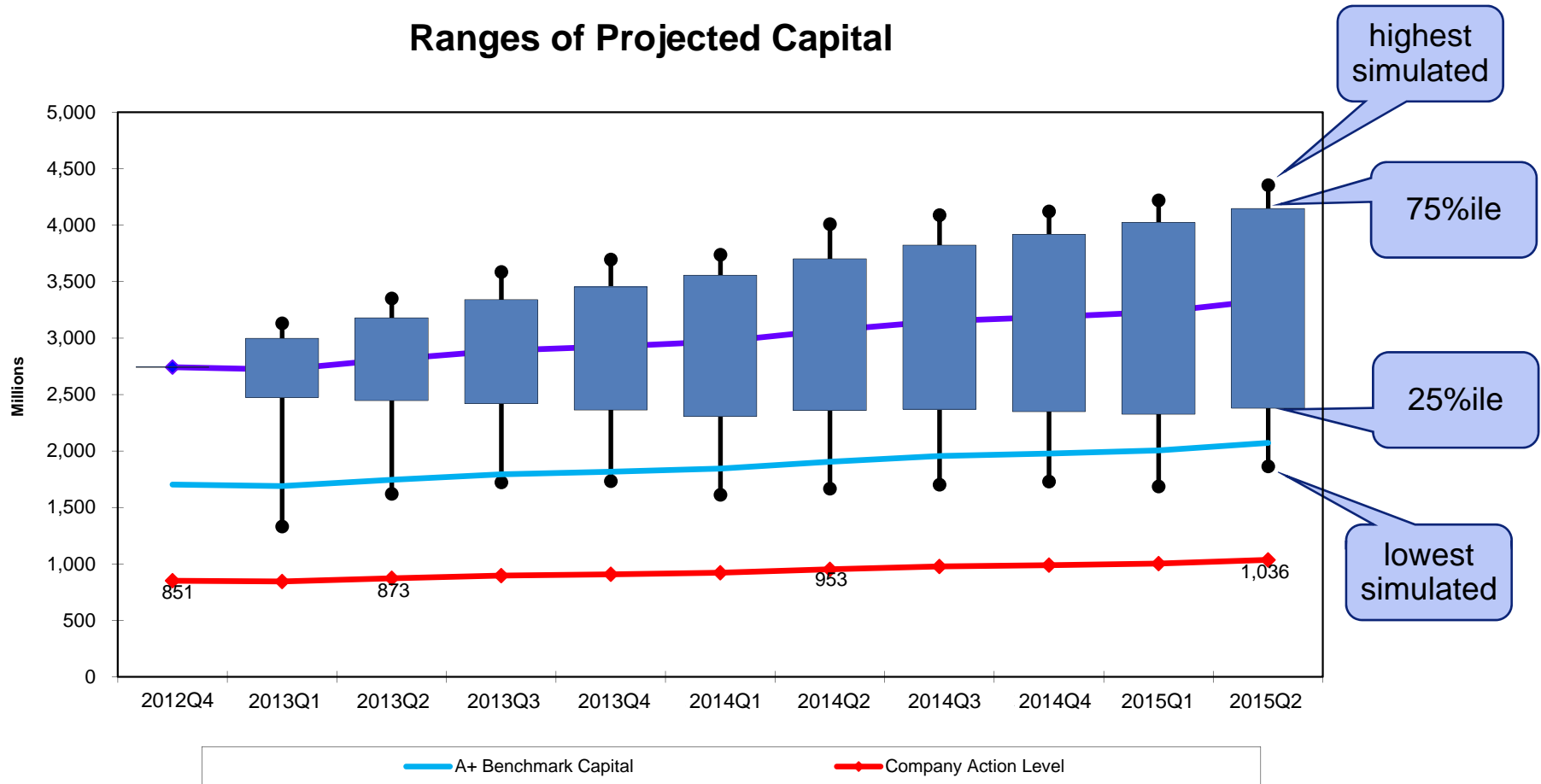
The Economic Capital Model as a “Stochastic P&L” System

- ◆ The moving parts of the ECM model correspond directly to the lines of a P&L
- ◆ The best estimate for each line item is tied directly to the financial planning process
- ◆ The variability of each item is based on (1) analysis of data, (2) substantial input from business leaders and (3) economic factors
- ◆ The result is a “stochastic P&L” projection that gives the probability distribution of potential outcomes



Capital Adequacy

Standard output shows range of projected capital relative to various adequacy thresholds



source: ADVISE® model

Evaluation of Risk Exposures

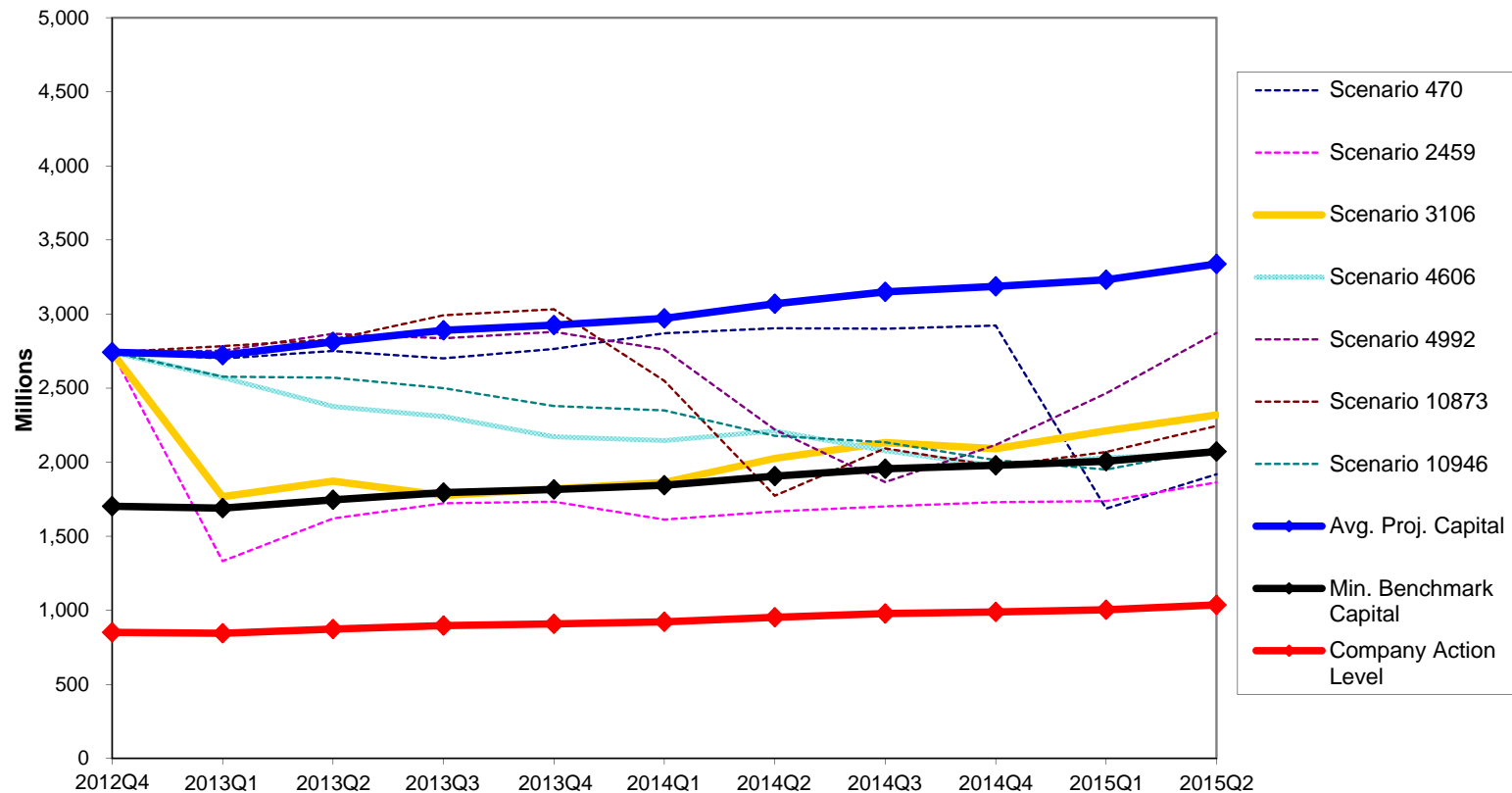
Concluding paragraph of ORSA Guidance Manual – Section 2

“By identifying each material risk category independently and reporting results in both normal and stressed conditions, insurer management and the commissioner are better placed to **evaluate certain risk combinations that could cause an insurer to fail.**”

Capital Adequacy: Downside Scenario Analysis

Stochastic model allows identification of specific scenarios that cross downside thresholds

Scenarios That Fail To Maintain Benchmark Capital



source: ADVISE® model

Group Assessment of Risk Capital and Prospective Solvency Assessment

ORSA Guidance Manual – Section 3

“Within the Group Assessment of Risk Capital (Assessment), aggregate available capital is compared against the various risks that may adversely affect the enterprise. Insurers should consider how the Assessment is integrated into the insurer’s management and decision making culture, how the insurer evaluates its available capital and how risk capital is integrated into its capital management activities.”

“Insurers should have sound processes for assessing capital adequacy in relation to their risk profile and those processes should be integrated into the insurer’s management and decision-making culture.”

Drill-Down Into Adverse Scenarios

- ◆ For most companies, no single risk can impair capital at the enterprise level, but combinations of risks can
- ◆ Your ECM detail and structure should enable meaningful drill-down into the causes of specific adverse scenarios, so you can understand the “why” of tail risk
- ◆ This is the critical information needed to validate the model, then determine appropriate management response to the risk exposure
- ◆ Engages management and promotes model usage in decision making (the “use test”)
- ◆ The ECM output provides insight into ERM process

Scenario Number and Description of Capital Impairing Events

470 – Reputation damage and subsequent loss of market share

2,459 – Reputation damage, loss of market share, adverse claim trend preventing recovery

3,106 – Unexpected investment losses, loss of key account, inability to fully achieve price increases

4,606 – Sustained adverse claim trend, inability to fully recover with price increases, loss of membership

4,992 – Unexpected losses due to poor underwriting, adverse results of market conduct

10,873 – Adverse regulatory action in key markets

10,946 – Sustained adverse claim trend, inability to fully recover with price increases, loss of membership

Risk Category Relationships

Concluding paragraph of ORSA Guidance Manual – Section 2

“...One of the most difficult exercises in modeling insurer results is determining the **relationships**, if any, **between risk categories**. History may provide some empirical evidence of relationships, but the future is not always best estimated by historical data.”

Aggregation and Diversification — Modeling Issues

The Guidance Manual lists several approaches to modeling aggregation and diversification effects

- ◆ Correlation matrices
- ◆ Dependency structures (a/k/a “cause and effect” models)
- ◆ Simple summation of capital requirements for individual risks

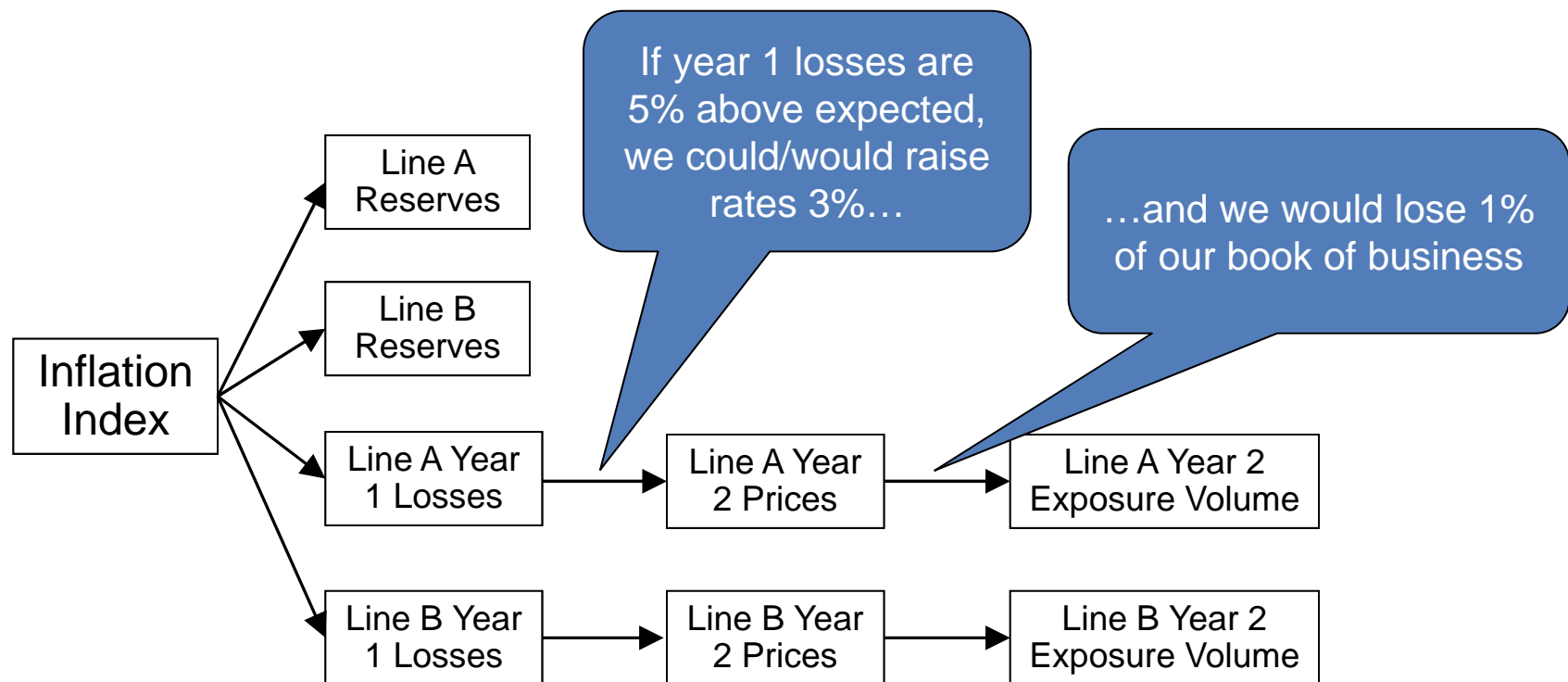
Structural Dependency Models vs. Correlation Matrices

- ◆ Example: two product lines are both affected by inflation, on both their prior-year reserves and future underwriting results
- ◆ Correlation approach will seek to drive the dependency through a correlation matrix

	Line A Reserve	Line B Reserve	Line A Future Loss Ratio	Line B Future Loss Ratio
Line A Reserve	1.00	?	?	?
Line B Reserve		1.00	?	?
Line A Future Loss Ratio			1.00	?
Line B Future Loss Ratio				1.00

Structural Dependency Models vs. Correlation Matrices

- ◆ Example: Two product lines are both affected by inflation, on both their prior-year reserves and future underwriting results
- ◆ Structural approach will seek to drive the dependency through cause-and-effect relationships



Making Model Assumptions Accessible to Non-Modelers

- ◆ Limitations of correlation/copula approaches
 - ❖ Assumes relationships go in one direction, continuous
 - ❖ Difficult to create sufficient joint tail outcomes for multiple risks
 - ❖ Difficult to interpret, discuss with business leaders, regulators, etc.

- ◆ Benefits of structural dependency approaches
 - ❖ The model looks more like how the business works
 - ❖ Therefore, more straightforward for management to provide input in how the assumptions should be set
 - ❖ Similarly, easier to validate model results — the modeler can parse a downside scenario by drilling back through the structural relationships to explain the business outcomes that drove it — management can then evaluate whether that assumptions makes sense, and if so what to do about the exposure
 - ❖ Finally, easier to model potential changes to management action that could mitigate the risk

2012 ORSA Feedback Pilot Project

- ◆ NAIC invited insurers to voluntarily submit an ORSA summary report in 2012
 - ❖ Opportunity to get feedback from regulators
 - ❖ Opportunity to help identify items in the Guidance Manual that need to be revised
 - ❖ Hundreds of companies eligible

- ◆ 14 ORSA reports submitted
 - ❖ 9 deemed complete
 - 3 included complete data
 - 6 had redacted data, but the intent and type of data was clear
 - ❖ 2 only included a framework
 - ❖ 3 omitted complete sections

- ◆ General impression: companies have a lot of work to do

Conclusion

- ◆ ORSA model regulations provide considerable latitude for implementation approach
- ◆ But overall requirements are beyond what most insurers are doing today, even those with relatively advanced ERM programs
- ◆ Insurers must begin to act now in order to meet the expected timeline for reporting
- ◆ A well-designed ERM program provides business benefits far beyond compliance



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