



**2007 CAS Spring Meeting  
Session #C12**

**Loss Reserve Ranges in Practice**

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# Loss Reserve Ranges and Variability

- Who wants to know?
- What are they asking?
- What are they REALLY asking?
- What are the challenges
  - Quantification
  - Description
- What are P/C insurance companies doing about it?

The perspective of this panel is practical —  
not theoretical or mathematical



# Who is interested in loss reserve uncertainty?

- Regulators
- Rating Agencies
- Shareholders
- Boards of Directors
- Auditors



# Why is there a discussion of loss reserve ranges?

- There is increased focus on the risks faced by property/casualty insurers.
- Various audiences want to understand the uncertainty in loss reserves.
  - What is the potential variation in loss reserves?
  - Does the company have enough surplus to cover the potential variation in loss reserves?



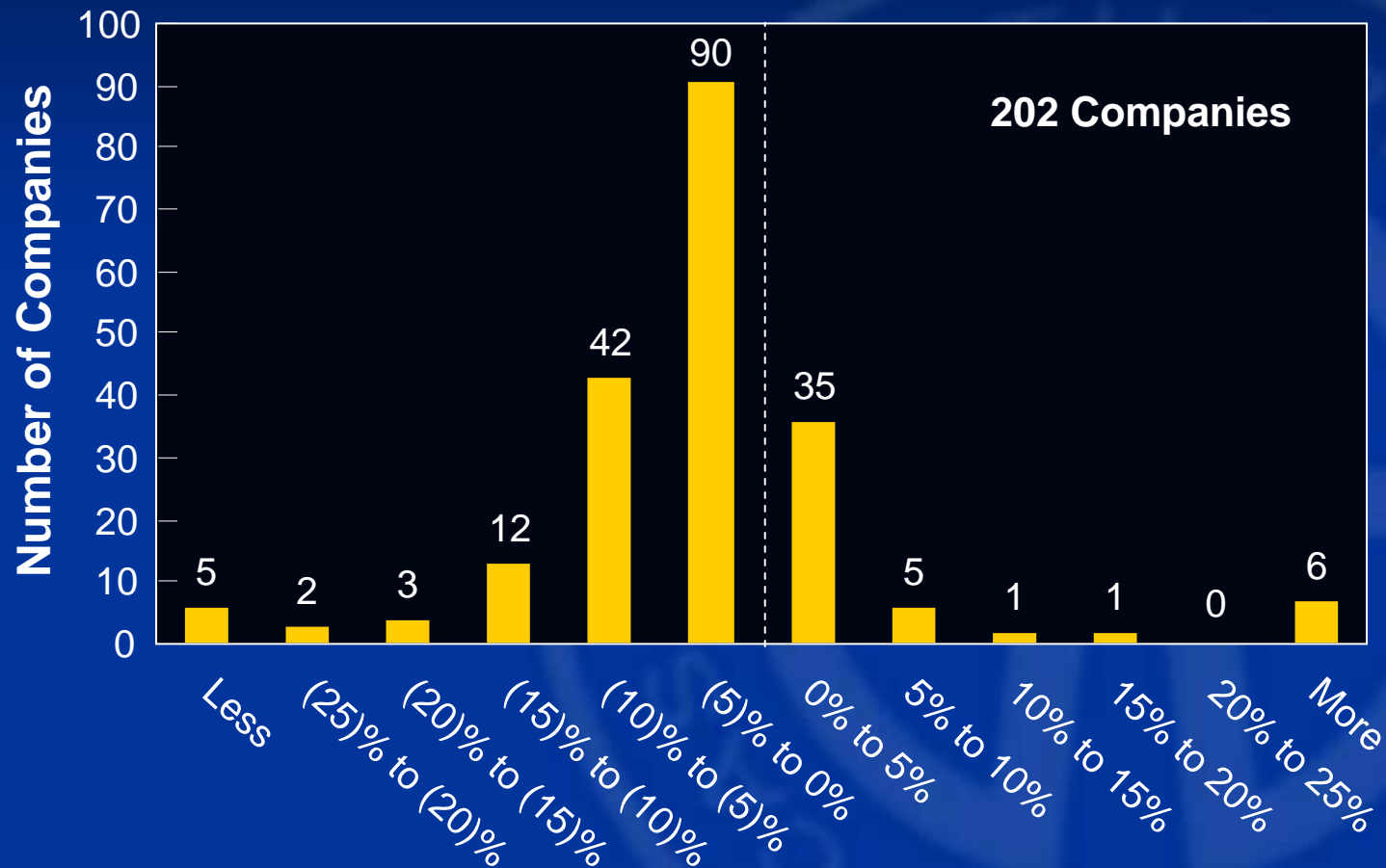
# Panelists

- Bob Conger – Tillinghast
- Ron Greco – Unitrin
- Tom Mount – A.M.Best
- All of you

Our comments are our own, and do not represent the views of our employers, our clients, or the CAS



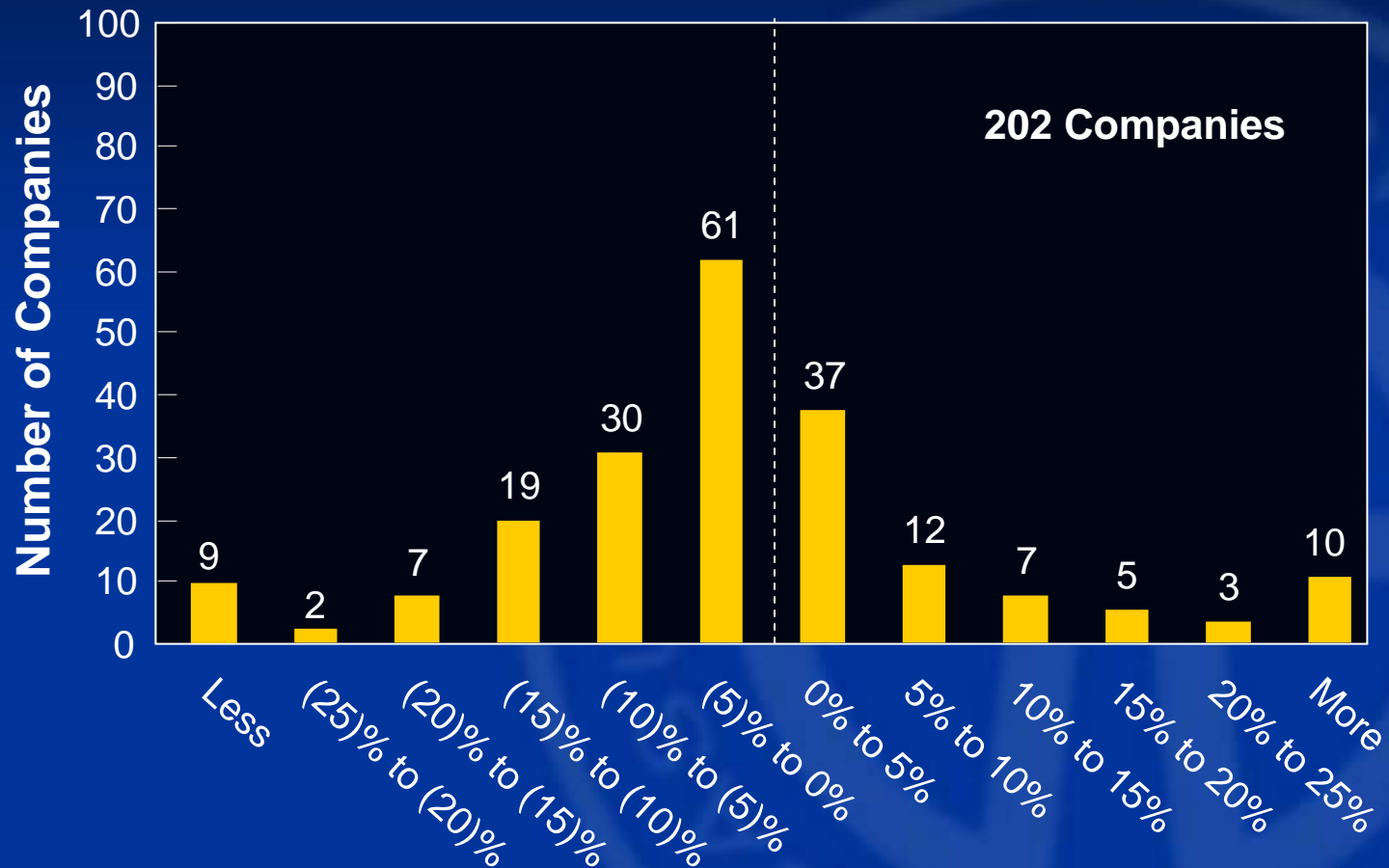
# Adverse/(Favorable) 1-year Development For Calendar Year 2006



Loss & ALAE Development as a % of 2005 Surplus



# Adverse/(Favorable) 2-year Development For Calendar Years 2006 & 2005



Loss & ALAE Development as a % of 2004 Surplus



External audiences are vitally interested in  
“management’s best estimate”

## 2002 criticisms

- “Perpetual additions” to loss reserves
- “Wildly inaccurate” estimates; surprises
- Reserving problems not just in asbestos, etc.
  - Also in “bread-and-butter” lines
- Reserve issues masking true company performance
  - Overall
  - Shortfalls in one line masked by redundancies in another





## Growing understanding that unpaid loss & LAE involves ESTIMATION and UNCERTAINTY

**2007**

- Top Ten Story #3: “Continued pressure on audit firms results in more critical review of underlying actuarial work”
- Securities and Exchange Commission
  - How did you derive/select the booked number?
  - How have your reserve estimates held up? Why?
  - What is the reasonably likely change to the current reserve?



The analysis and communication of uncertainty is not a “US-only” issue

## UK Actuaries: from GRIT to ROC

- 2005 GRIT is the word
- 2006 A new Guidance Note 12
- 2007 ROC Working Party

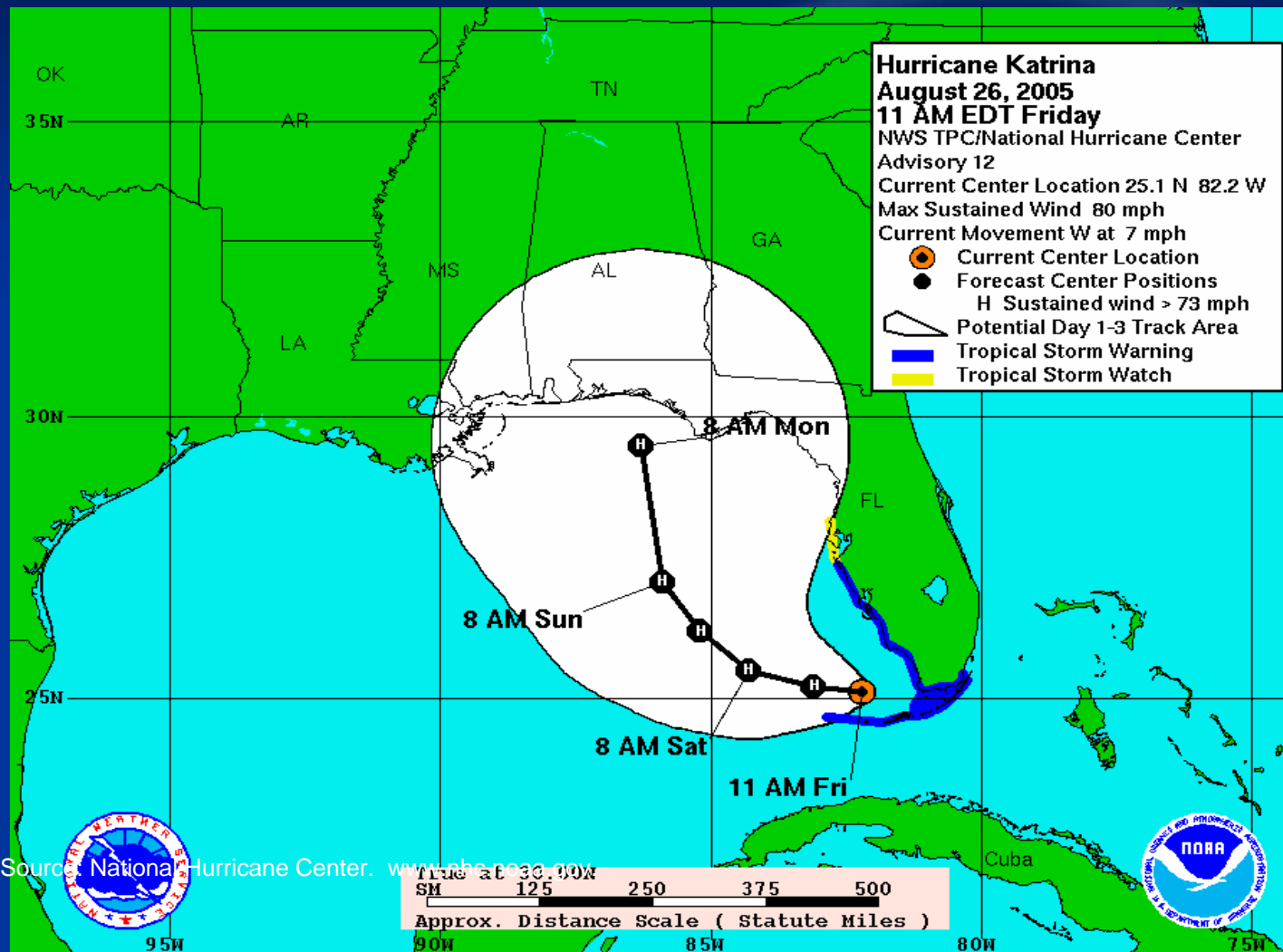


## Insurance company responses to SEC reflect the evolving state of practice

- “We do not calculate a range”
- “Mathematics of determining ranges has not been sufficiently developed”
- “The range of estimates around the actuarial best estimate is statistically determined”
- We estimate that potential variability of reserves, within reasonable probability of other possible outcomes, may be plus or minus \$XXX million
- “Ranges are not a true reflection of the potential volatility”
- “No precise methods for evaluating the impact of any specific factor”



As with hurricanes, it is prudent to consider more than just the best estimate in planning actions





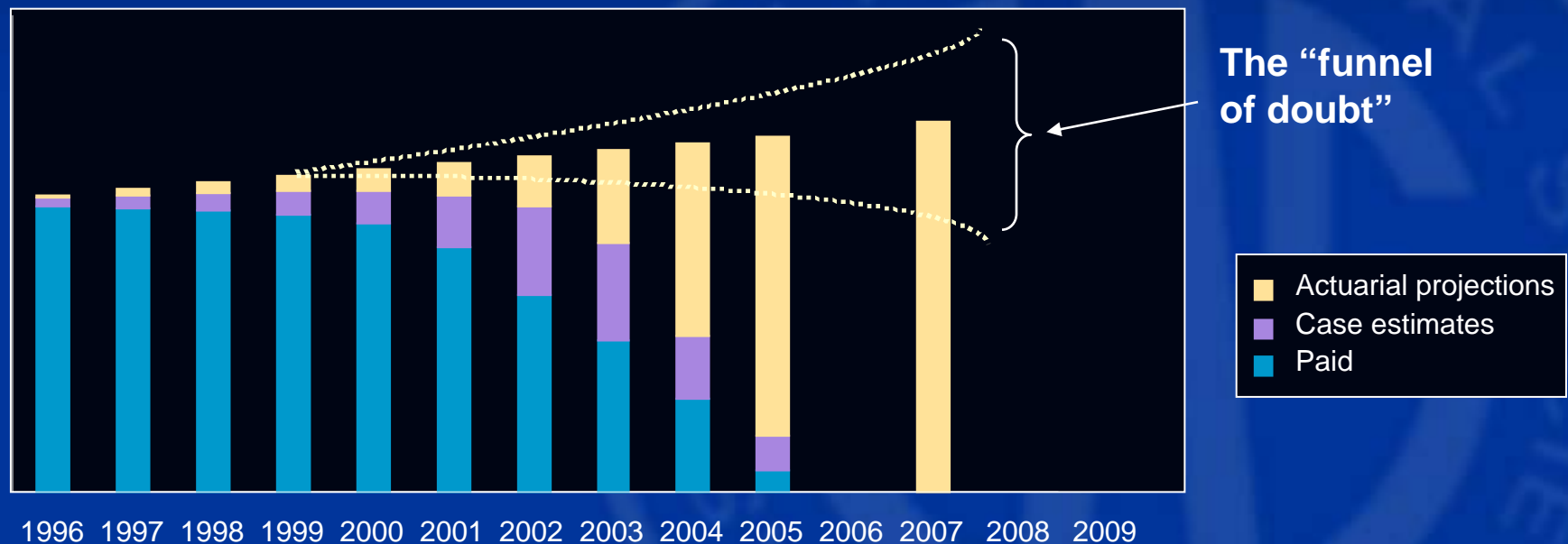
## Evaluating the uncertainty of claim liabilities has many business purposes

- Financial and capital management
  - Anticipate potential for “bad news”
  - Evaluate “needed” surplus
  - Allocation of capital by line or branch
  - Reinsurance terms
- Operational and strategic
  - Monitor results; identify significant plan deviations
  - Evaluate investments and growth strategies



# Assumptions used to make insurance decisions need to consider more than just one estimate

## Actuarial Pricing Problem



- Reserving analysis is not just about looking backwards!



Analyzing and communicating loss reserve ranges (and uncertainty) is important

....but not necessarily easy



...Ron

...Tom





# What KIND of range?

- What kind of question are we trying to answer?
  - Range of reasonable estimates
  - Range of likely outcomes
  - Risk of material adverse deviation
  - Range of possible outcomes
- Must clearly explain
  - The answer, and what it means
  - How to interpret the answer



# Approaches to estimate reserve variability

- Broad-based benchmarks for variability of loss reserves by line of business
- Consider various hypotheses about the underlying loss processes – and quantify their implications
- Analyze the past range of movement in the Company's actuarial data triangles

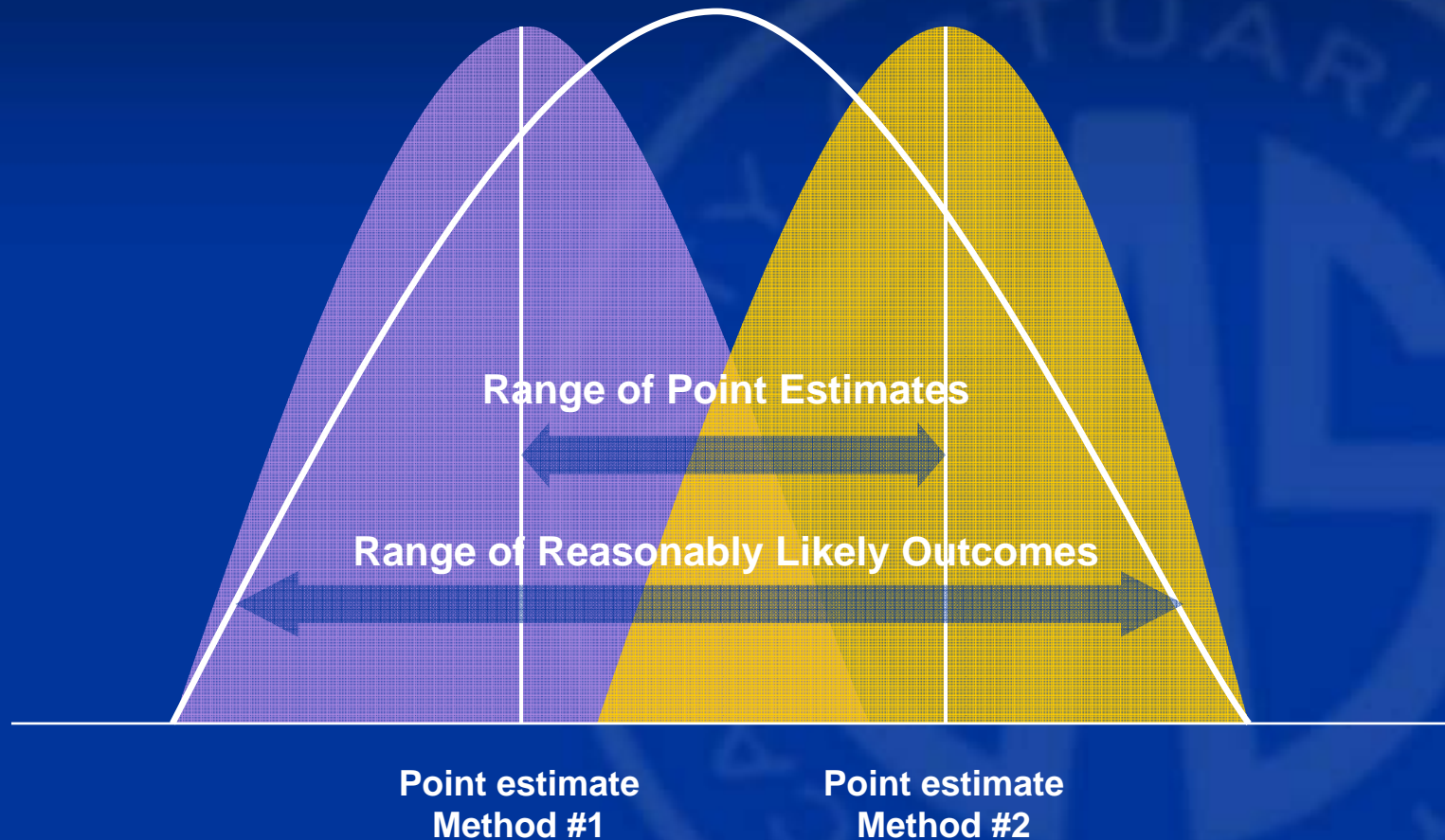


# Analyze past range of movement...

- Deterministic
  - Select various point estimates
- Stochastic
  - Statistical methods to quantify the distribution of results implied by historical data variability
- Hindcast
  - Historical application of methodology to quantify degree of departure of actual vs. projections



The range implied by the point estimates from several methods is likely to understate the overall range of reasonably likely outcomes





# Various stochastic methods are emerging

- Mack method
- Bootstrapping
- Christophides
- Practical
- Hodes, Feldblum, Blumson
- Zehnwirth

Each has strengths and weaknesses



# Hypothesis testing

- Traditional / Implicit
  - e.g. paid versus incurred development methods
- Adjusted
  - e.g. Berquist-Sherman
- Explicit
  - e.g., explicit inflation assumption



# Benchmarks

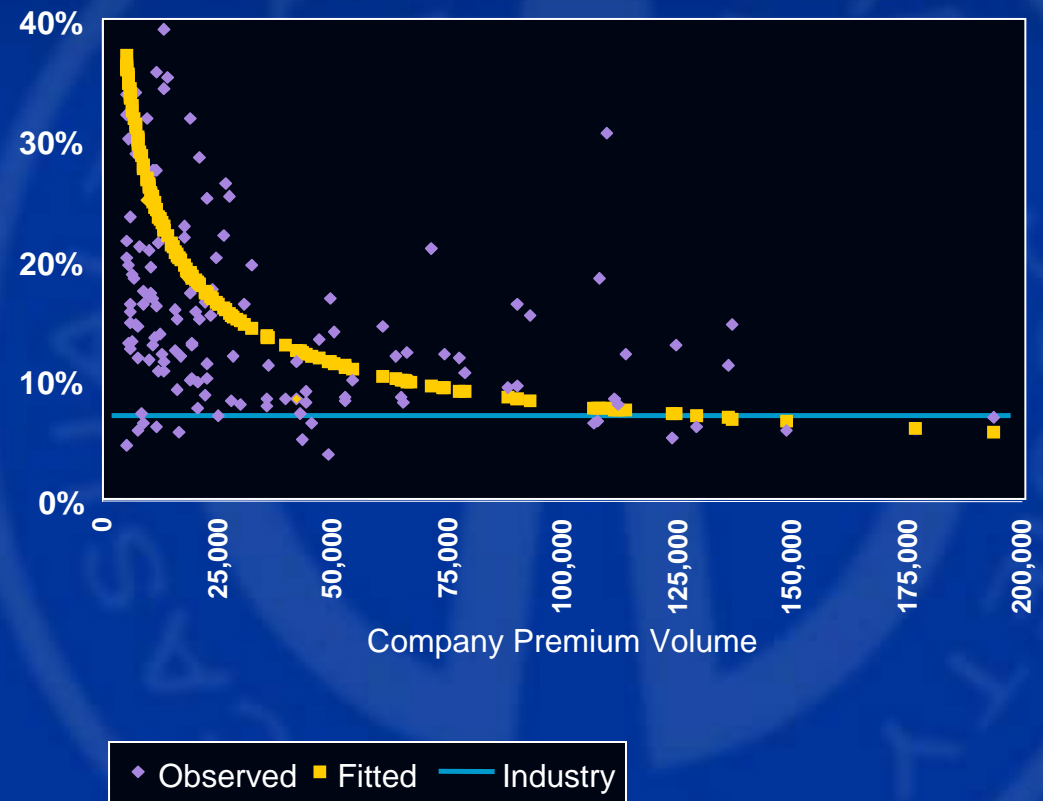
- Industry analyses of variability
- Hindcast analysis of industry results
- Simulation based on industry parameters



## For smaller companies, process risk may have a significant influence on overall variability

- The effect of volume on process volatility is easier to measure in an underwriting than a reserving context
- For commercial auto liability, underwriting process risk is largely eliminated when premium volume exceeds \$150 million
- In the context of claim liability variability, one needs to decide whether the objective is to capture more than just process risk

Commercial Auto Liability —  
Standard Deviation of Gross Loss Ratios







# No one approach is perfect

- Depends on the question being asked
  - ...and the purpose of the analysis
- Strengths and weaknesses of the alternatives
  - Selection criteria align strengths of method with the most important elements of the questions
- We actuaries have more work to do
  - ...and our publics are going to demand that we do it



Let's learn a bit more about how one company  
approached the practical realities



...Ron



Questions? Discussion?



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