

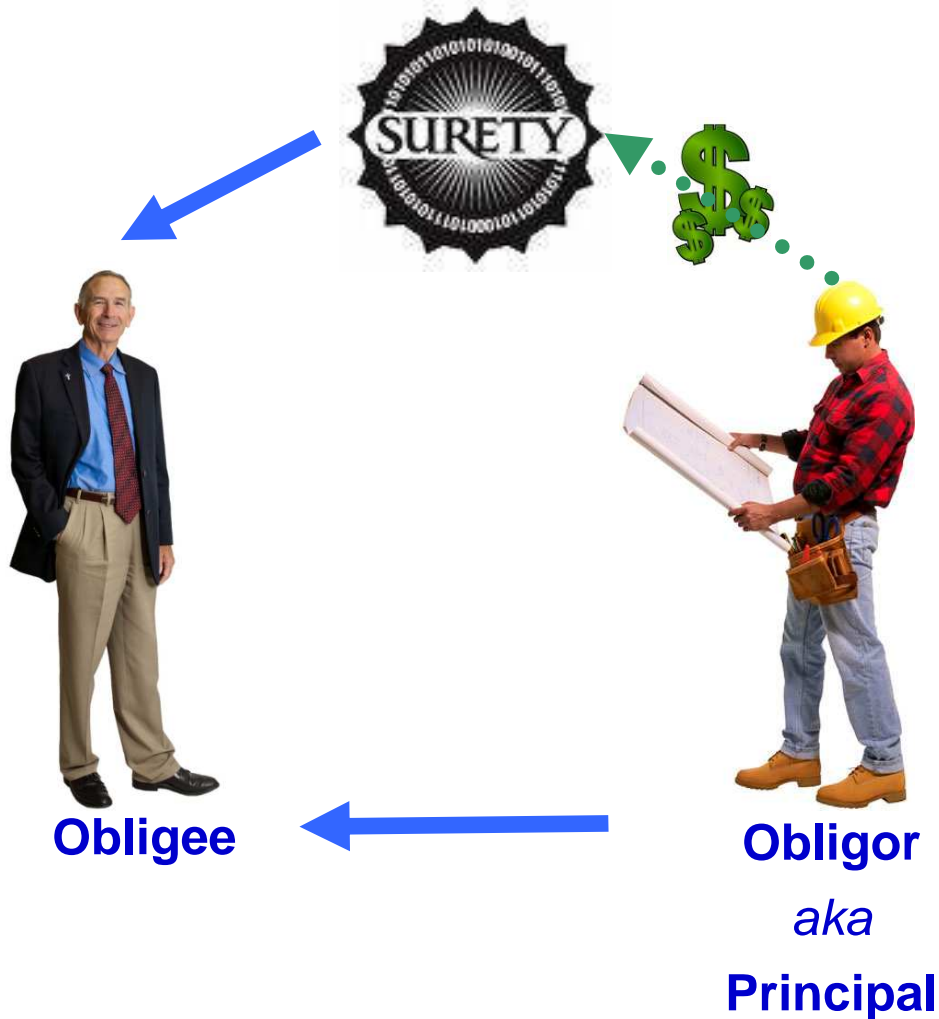
Lessons from Surety Exposure Rating

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2 Minute Introduction to Surety

Surety Bonds Guarantee Performance to a Third Party



- Financial product
- Not insurance
- No duty to Principal
- Many remedies and mitigation

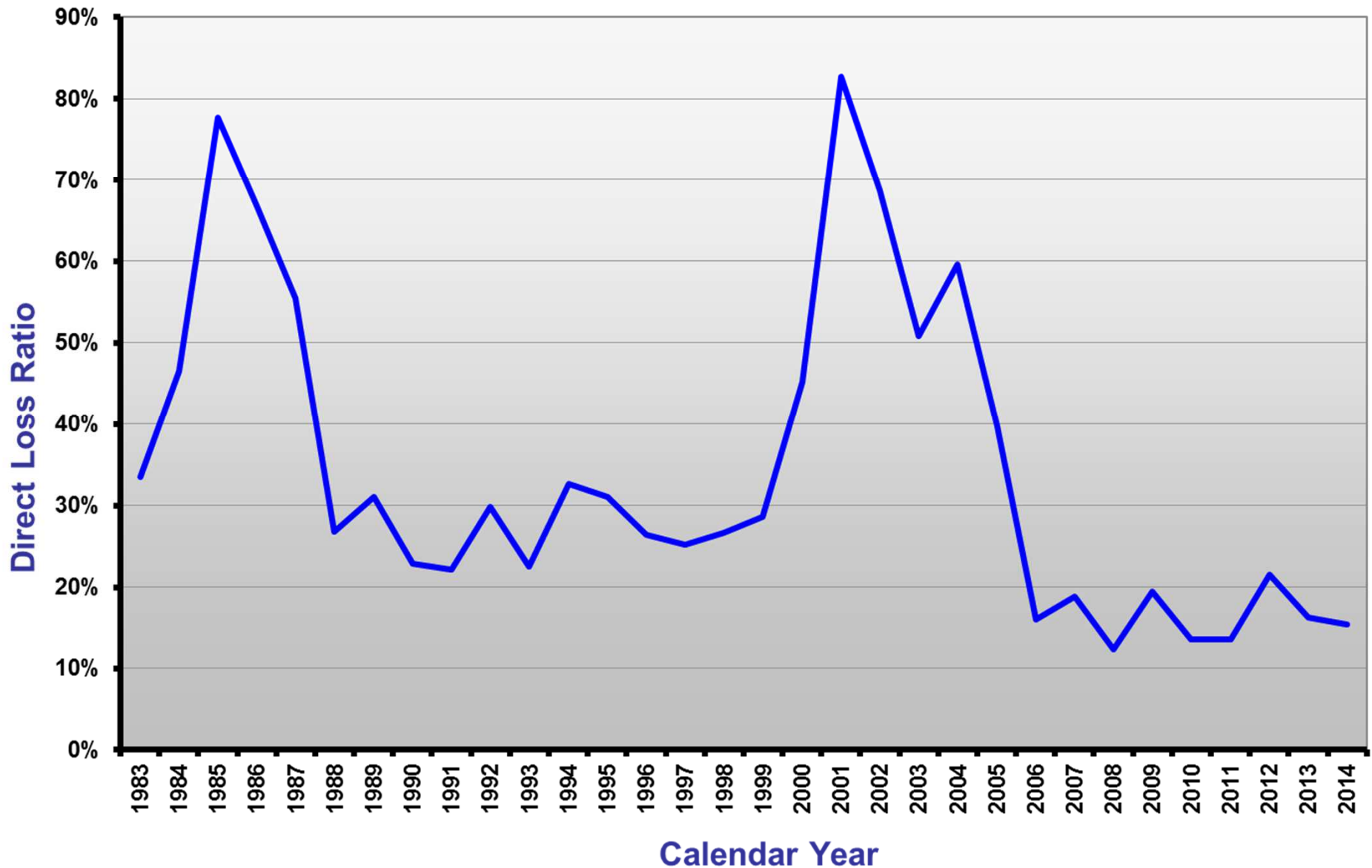
- 2 Major Types
 - Contract
 - Commercial

- Contract can be exciting
 - Long-duration
 - Loss can be twice the limits
 - High stakes game

- Commercial is usually benign

Surety Results are Cyclical

Economic Conditions Impact but do NOT Control



Lessons from Surety Exposure Rating

No Rocket Science



Reinsurance Exposure Rating is Like Squeezing a Balloon



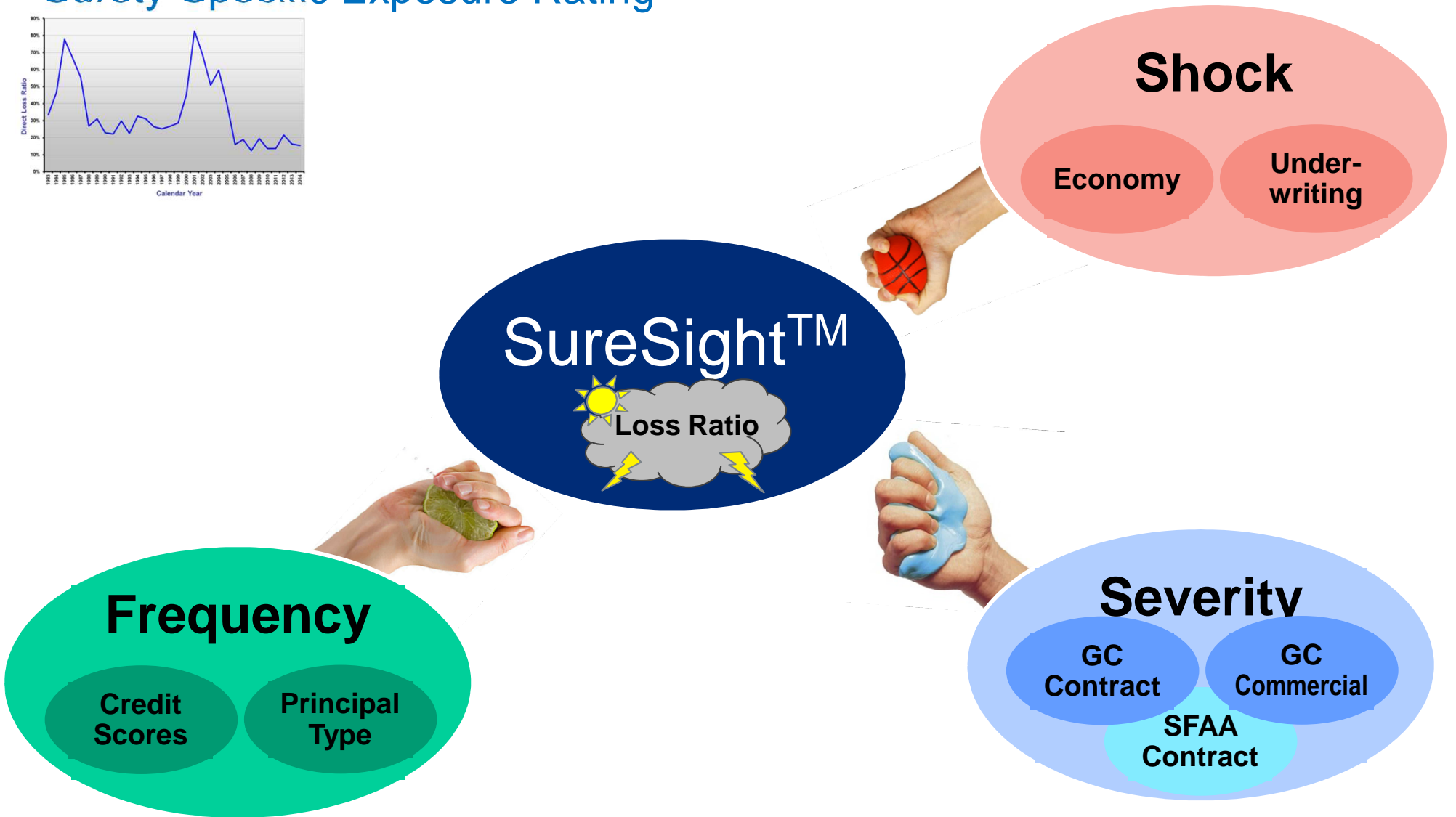
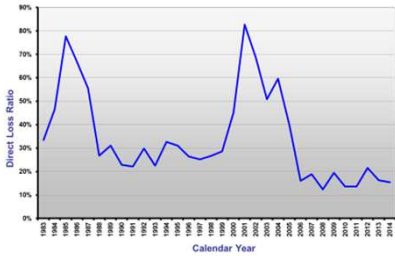
If You Squeeze Too Hard, The Bubble Bursts



Maybe this bubble wasn't quite large enough...

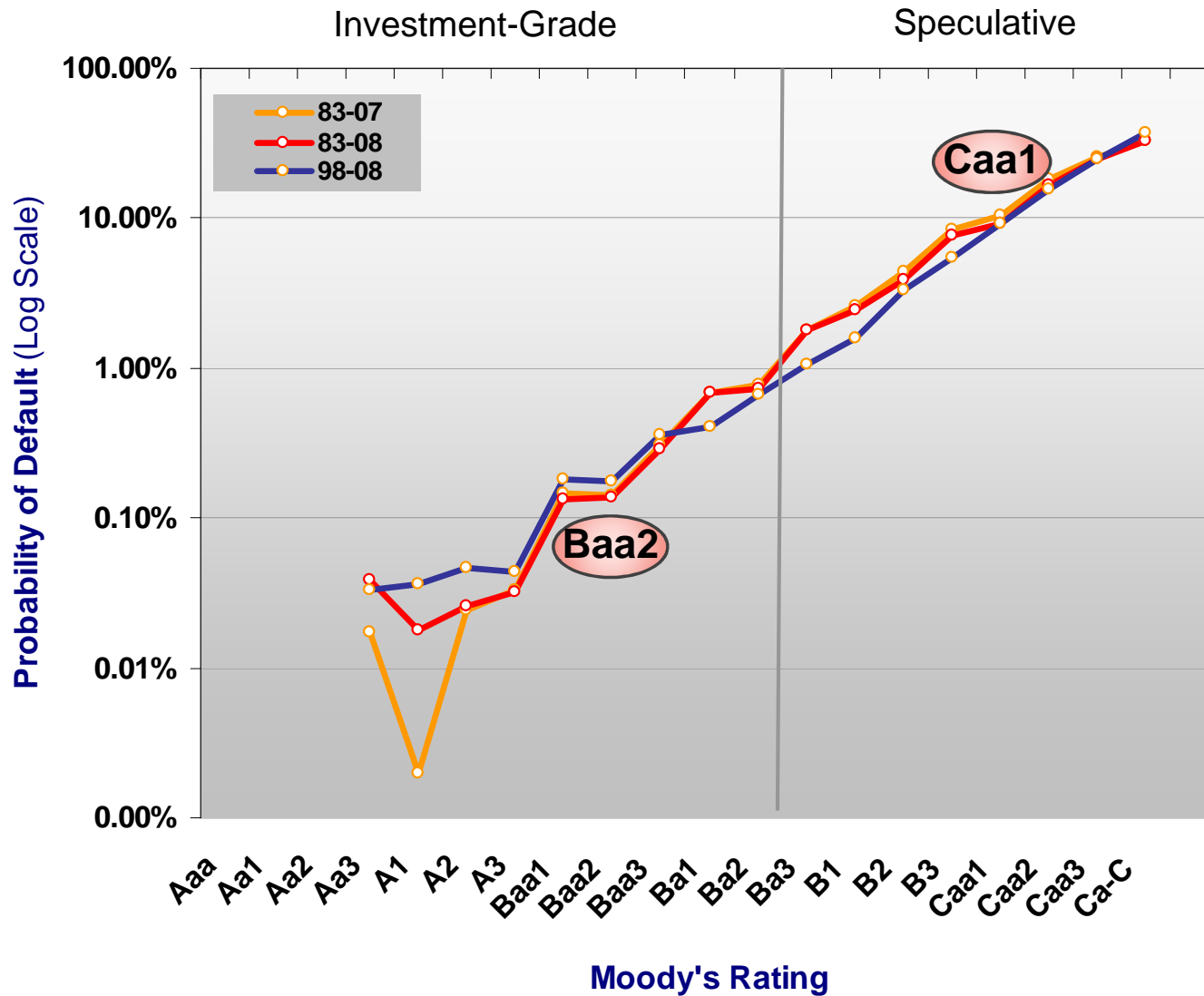
Maybe I need another piece of bubblegum...

SureSight™ Surety-Specific Exposure Rating



Does Each Policy Have the Same Probability of Loss?

Adjust those frequencies!



- **Surety**
 - Relative Credit Quality
- **Casualty**
 - Risk Mgmt
 - Firm Size
 - Attachment Point

Is Life Really So Simple?

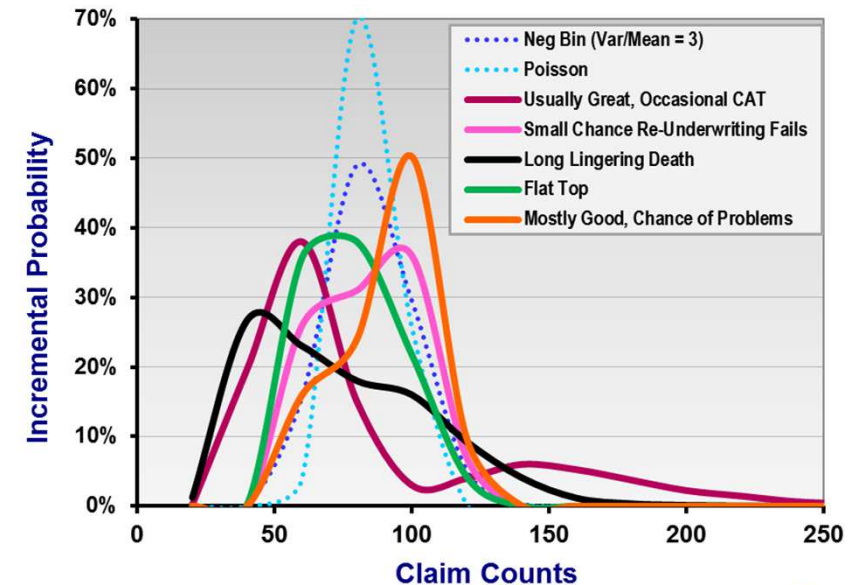
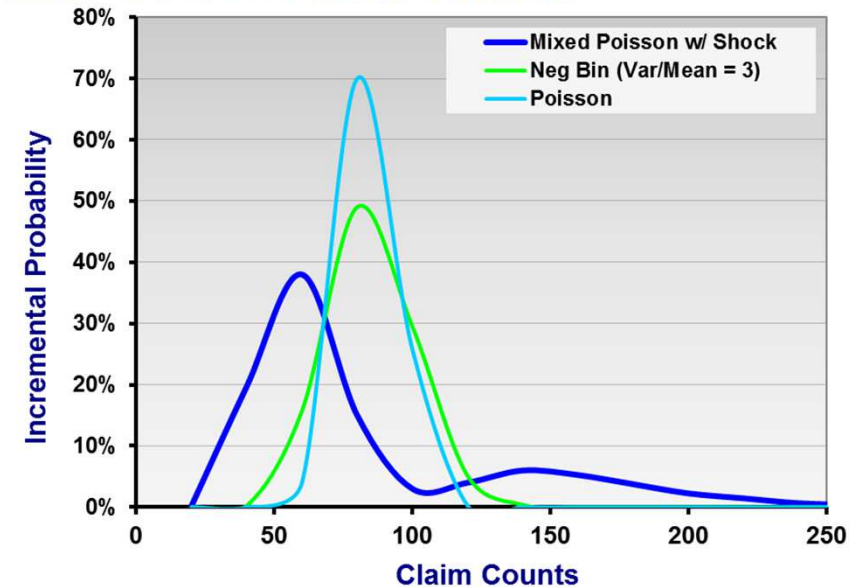
Try Mixed Poisson to Reflect the Complexities of the Real World

- Surety

- Most years have a very low frequency
- Every so often frequency triples
- Neither Poisson nor Neg Bin works
- Mixed Poisson works great

- Casualty Applications

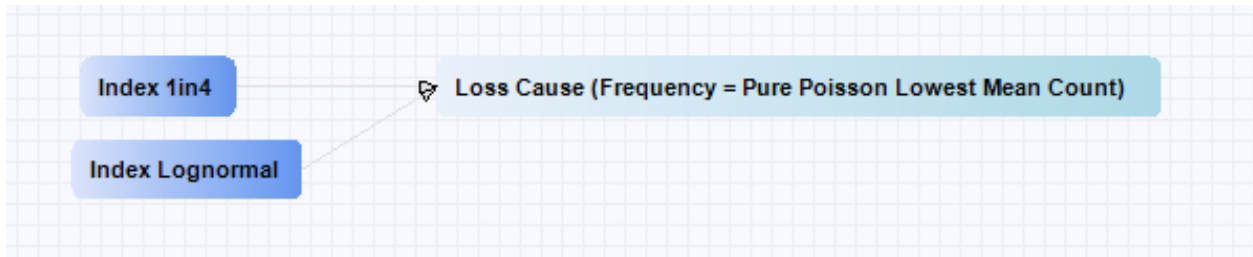
- Casualty CAT
- Probability that re-underwriting works
- Possibility of tort reform
- Achievability of plan
- Plateau of probability



Mixed Poisson May Take Some Trial and Error

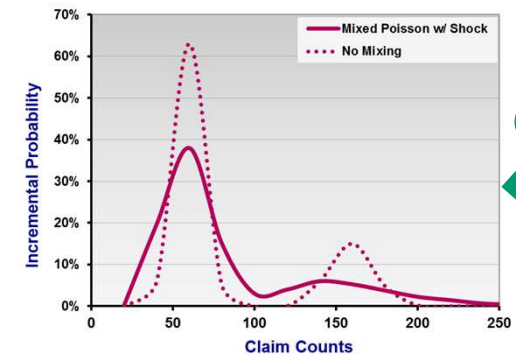
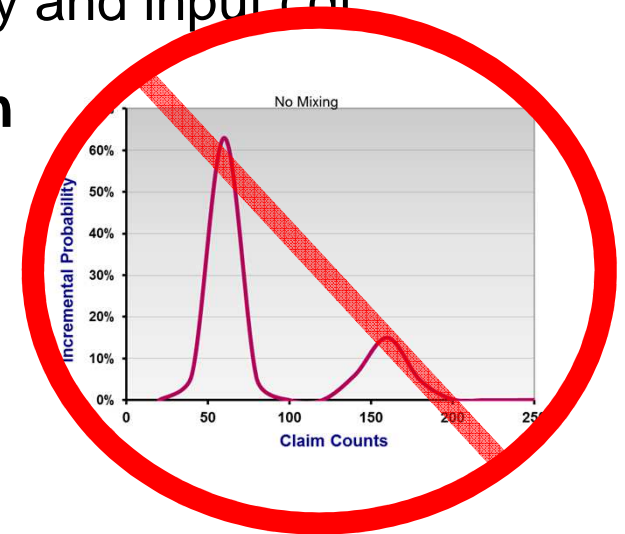
Technical Notes

- Models often don't support directly
- You can achieve Mixed Poisson if you can multiply Poisson lambda
 - Base distribution = Poisson with lowest mean
 - Index/stochastic multiplier with annual frequency and input cdf
- Probably want some kind of mixing distribution
 - Otherwise you risk holes in the distribution



Index 1-in-4

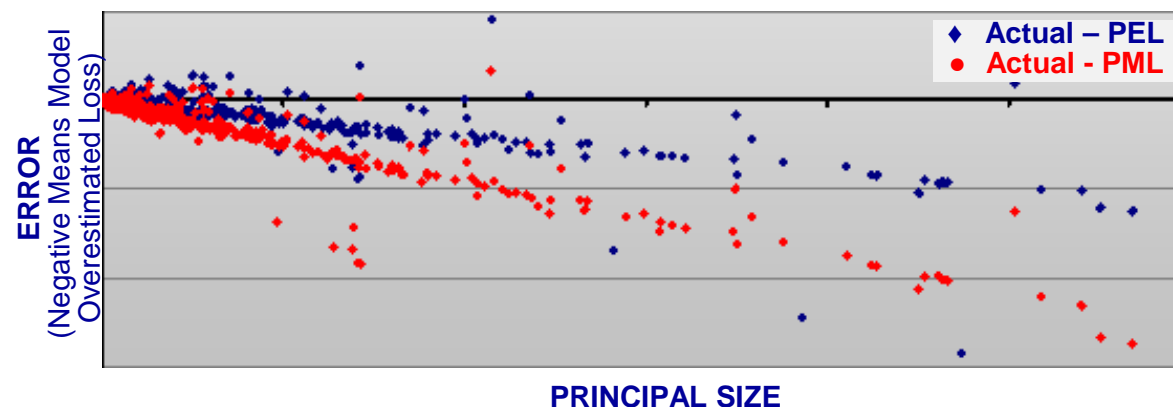
CDF	Value
0.0000000	1
0.7500000	1
0.7500001	3
1.0000000	3



Do Your Actual Severities Resemble the Model Severities?

Backcast your claims data and see!

- **Surety**
 - Single public exposure model
 - Everyone uses it but how accurate is it?
- **Casualty**
 - Probably have more credibility than Surety
- **Method**
 - Put exposures that generated claims through the exposure model
 - Compare predicted mean and PML claims to actual



Is the Inforce Portfolio Really a Good Proxy for the Future?

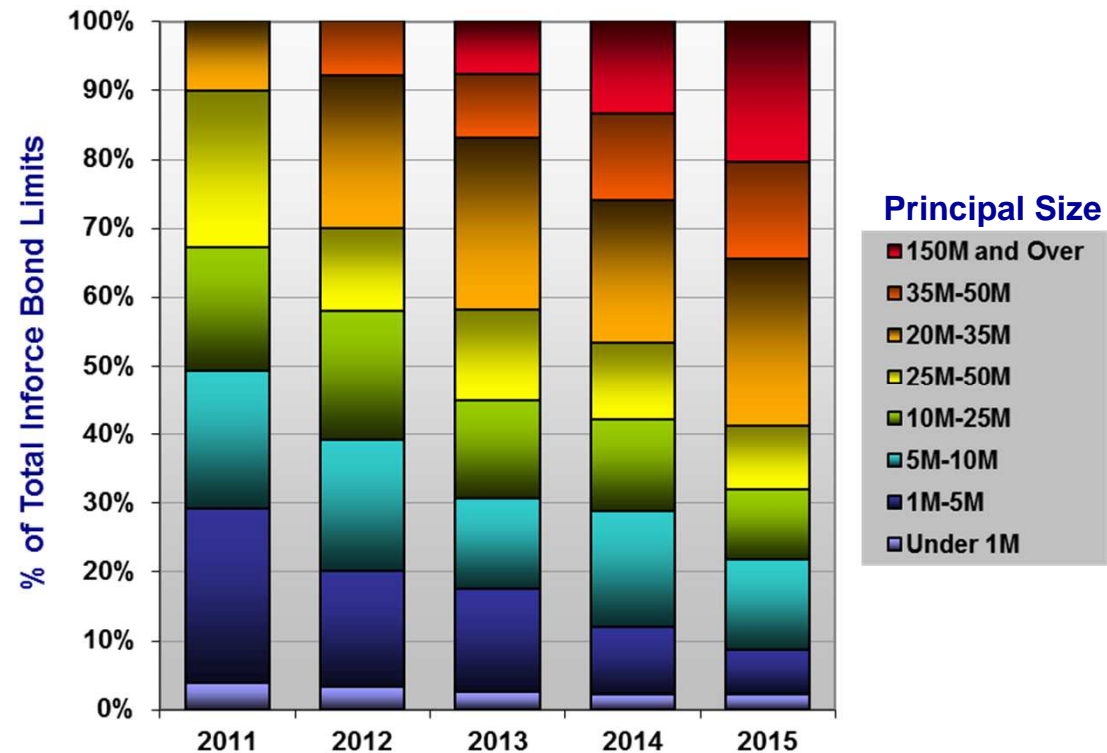
Adjust those Exposures!

- **Surety**

- Principal Sizes Increase in:
 - Maturing Books
 - Growing Markets
 - Increases in Capacity

- **Casualty Applications**

- Introduction of:
 - Higher Limits
 - Larger Firms
 - Riskier Books of Business



That's All Folks!





GUY CARPENTER