CLRS ERM

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So You Have a Reserve Distribution, What is Next In The ERM Realm?

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Outline

- The Problem
- A Normal ERM Reserve Risk Progression
- Underlying Issues
  – Recommendations
- Recognition Implications
  – Recommendations
- Management Decision Making Processes
  – Recommendations

The Problem

- Number 1 liability on every company's balance sheet
- Companies still struggle to identify a range much less a full reserve distribution
- The ERM process is worthwhile even without perfect models
- Models should migrate to greater sophistication as the user gets more information
- Users should understand how reserve volatility is being generated
- Reserve risk should not live by itself in your ERM process

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A Normal ERM Progression

- Basic:
  - Reserve ranges developed
  - Mu and sigma of lognormal calculated
  - Dropped into a black box
  - Happy?
- Questions:
  - Consistent with reserving group?
  - Does it really reflect a reserve distribution?
  - What is the underlying model?
  - Does the model produce volatility in ultimates or cash flows?

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A Normal ERM Progression

- Basic + 1:
  - Statistical methods are used to create reserve distributions
  - Output is dropped into ERM model
  - Black box mixes output with other risks
  - Happy?
- Questions:
  - Ultimates or cash flows?
  - How are dependencies handled?
  - What are the knock-on effects in the model?
  - How do you measure management decisions?

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Underlying Issues

- There are many considerations when you incorporate reserve risk.
  - Form of reserve risk model
    - Drivers
    - Gross vs net
    - Catastrophe and/or large loss risk
    - APH
    - Dependencies within the reserve risk model
    - Ultimates vs cash flows

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Underlying Issues

- There are many considerations when you incorporate reserve risk.
  - Dependencies with other risks
  - Development recognition
  - Knock-on effects in model

Form of Reserve Risk Model

- So many things that can go into a model
- Understand what drivers make up your book and how they come thru the model you selected
- Is your model robust enough?
  - Bootstrapping may only be step 1
    - CAT/shock loss
    - Economic shocks
  - Gross vs net modeling
    - Reinsurance and Sal/Sub
- Did your internal ERM team develop the reserve distribution without input from reserve team?
  - We have a problem Houston!

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Recommendations

- Understand your book
- If you have large loss potential consider:
  - Bootstrap attritional losses
  - Model large losses separate
  - Murphy and McLennan Paper
- Model CAT and/or APH development separate and using different techniques

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Dependencies

- Within reserve risk model
  - Did you model loss, ALAE, ULAE separate?
  - ALAE
    - Internal or external adjusters
  - ULAE
    - By line or in aggregate?
    - Thresholds?
  - Dependencies across LoB's
    - More severity driven for reserve risk
    - UW risk is frequency and severity
    - Reserve risk LoB's dependency should be at most equal to UW LoB dependency

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Recommendations

- Model Loss & ALAE together
  - There should be sufficient underlying dependency to drive this relationship implicitly
  - Make sure balances with your separate analysis results
- Model ULAE separately with restrictions
- SENSITIVITY TEST DEPENDENCIES!!!

Dependencies

- With economics
  - How does your model reflect future inflation
  - Historical realizations of inflation in triangles may not be enough
  - Some LoB's have strong calendar year sensitivities

Recommendations

- If you have a very sensitive line of business to economics such as:
  - Surety
  - Workers compensation
- Consider
  - Building in very strong dependency with ESG or
  - Bootstrapping inflation adjusted triangles and explicitly modeling inflation or
  - Developing a predictive model and incorporating reserve risk as an explicit causal model

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Knock-On Effects

- What happens after a reserve deterioration occurs
  - Future pricing implications
    - Can you actually take the indicated need
      - Regulatory
      - Competitive
    - How long would it take you to recognize the need or get it accepted
    - How long to realize the full need
    - How do you replicate your internal rate change process
  - Do you have an Aggregate Stop Loss or LPT with conditions that need to be modeled
  - How does your future RI get priced
    - Do you purchase

Recommendations

- Not for the faint of heart
- Don’t start out your ERM modeling with full knock-on effects
- Do pick out a couple key items and build upon
- Cash flow modeling is superior as it allows you to do more now and later

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Recognition of Reserve Deterioration

- Does your model recognize reserve deterioration instantly?
- What type of exercise is your ERM process:
  - Economic capital
  - Risk management
  - Both
- What are the economic capital implications

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Recommendations

- Start out with full recognition
- If modeling process is intended to be only risk management tool than you may not need to go any further
- If model is intended to be a capital model
  - Develop a recognition process to be included after you have model up and running
    - Based upon company reserving procedures

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Management Intervention

- Building management intervention rules requires a lot of thought
- Areas we have just covered include:
  - Ratemaking decisions
  - Reserve recognition
  - RI purchase
- Anybody can develop a modeling rule but:
  - Is it consistent with actual practice
  - Will rating agencies/regulators buy into
  - Is it just a cover up

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Recommendations

- Start without and get up and running
- Build your phase 2 ERM process to include Management Intervention processes
- Be able to turn these on and off to show relevant parties their economic impact on the company
- Make sure if you include the process it is based upon actual practice

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