Considerations in Reinsurance Reserving

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Agenda

- Segmentation

- Use of initial expected loss ratios (IELRs) in reinsurance reserving

- Impact of terms & conditions

- Ranges

How should review data be segmented?

- By treaty
    - Good approach for relatively new companies or books of business
    - Easy to link pricing and reserving assumptions
    - Results will be responsive to changes in:
        — Effective date distribution
        — Term
        — Attachment points and limits
        — Attachment basis (risks attaching vs. losses occurring)
    - Allows for modeling of AADs, loss ratio caps, corridors, profit commissions, etc.

How should review data be segmented?

- **By class/line**
  - Works well for stable segments with significant volume of historical data
    - Can incorporate historical development experience
  - Less prone to bias in method selection
  - Conducive to high level reasonability checks
    - E.g. loss ratio movements by year

How should review data be segmented?

- Blending of aggregate approach and individual treaty approach
  - Build up benchmark development patterns and IELRs by treaty
  - Select development patterns at the class level considering:
    — Historical class development experience
    — Benchmark development pattern
    — May need to use different patterns for each u/w yr.
  - Select ultimates at the class level
    — Certain contracts with unique features may still need to be reviewed separately

Establishing Initial Expected Loss Ratios (IELRs)

- Frequently IELRs are selected by treaty
  - Based on individual treaty pricing
    - Potential problem is that degree of conservatism varies depending on where we are in the market cycle
  - Advisable to establish market perspective for key lines of business to test reasonability of IELRs resulting from aggregation of treaty selections

Should IELRs be revised over time?

- **Some would argue that IELRs should not be revised**
  - By definition, "a priori" estimates should not be changes as experience comes in
  - B-F method allows for recognition of experience as it emerges
  - What methodology should be used to revise IELRs?

Should IELRs be revised over time?

- Argument for revising IELRs over time
  - B-F'ing using unadjusted IELRs was part of the reserving problem in the last soft market
  - For some treaties, IELRs may be "soft" estimates
    — E.g. treaties with little historical data
  - IELRs based on projected price changes – actual rate changes should be known at the end of the underwriting year
  - For some treaties, IELR based on estimated subject premium by line
    — Distribution of actual subject premium compared to estimated subject premium can sometimes have a large impact

Example of impact of changes in premium mix on a flat rated $1 million excess of $1 million casualty treaty

	Estimated Subject Prem	Actual Subject Prem	selected 1 x 1 loss rate
Umbrella	120,000	160,000	35.0%
GL	300,000	275,000	1.0%
AL	325,000	305,000	1.0%
Total treaty	745,000	740,000	

	Using Estimated Subject Prem	Using Actual Subject Prem
loss rate	6.5%	8.4%
reinsurance rate	8.0%	8.0%
IELR	81.0%	104.4%

Recommendations regarding use of IELRs

- Update IELRs at renewal based on actual rate change data, premium distribution

- Review IELRs by year to ensure that relationship between underwriting years is sensible

- Continually monitor results for signals that original IELRs may be biased
  - If Actual > Expected across all casualty classes, this may be more than noise

- Consider using a Stanard-Buhlmann method at the line/class level
  - More responsive to emerged experience than B-F method

Reflection of terms & conditions

- Changes in terms & conditions are an important component of the market cycle, but impact is often not quantified
  - Changes in T&C can broadly be grouped into 2 types
    - "Quantifiable" – e.g. changes in ceding commission, limits, attachments, AAD's, corridors
    - "Other" – changes in exclusions, commutation provisions, cut-off vs. run-off, special acceptances, etc.

How should T&C changes be reflected in reserving?

- Changes in T&C should be monitored by treaty
  - T&C changes should be captured for both the primary business being reinsured as well as the reinsurance contract
  - Directional changes can be logged
  - Can discuss relative importance with underwriters, claims personnel
  - Over time, the tracking of T&C changes in connection with a robust price monitor may assist in the quantification of the impact of T&C changes

Likely Impact of T&C changes

- Understatement of IELRs in softening market/ overstatement of IELRs in hardening market
  - May consider additional IBNR provision for T&C slippage

- Impact on loss development?
  - We have observed in reinsurance development data that development for the soft market appears to be slower than for the hard market
    — Is this a T&C impact?

Determination of Reserve Ranges for Reinsurers – Stochastic Techniques

- Stochastic loss development based methods may not always work well for reinsurers
  - Development extremely long tailed for certain lines
  - B-F method commonly used instead of chain ladder method for long tailed lines
  - Within a line, changes in mix over time often complicates analysis
  - Benchmarks are often utilized – difficult to implement into range analysis

Determination of Reserve Ranges for Reinsurers – Stochastic B-F

- Stochastic B-F method may work well in certain instances
  - IELR and loss development factors generated stochastically
    — Distribution of IELRs and parameters may need to be based partially on judgment
    — Distribution and parameters of LDFs can be based on historical development if sufficient volume exists
    — Methodology allows for reflecting correlations between underwriting years for the IELRs
  - More judgment may be required to transform total resulting range into a range of reasonable estimates

Determination of Reserve Ranges for Reinsurers – Varying Assumptions

- **Ranges can be estimated by judgmentally altering assumptions**
  - **Can be performed by treaty**
    - Treaties with less volatility, more historical data will have tighter ranges
  - **Slowing down/speeding up development patterns**
  - **Range of reasonable IELRs**

Determination of Reserve Ranges for Reinsurers – Correlation considerations

- **Correlations need to be considered**
    - Between treaties within a line
    - Between years
    - Between lines

- **For casualty, it is often reasonable to assume a high correlation between years**
    - Long feedback loop

- **Correlations between lines**
    - can be judgmentally determined
    - Industry Schedule P data can be used