

6.6 Summary

⌚ 10m

Frequency-Severity Techniques

- **Pros:**
 - Produce more stable estimates than the development method, especially for earlier maturities.
 - Give actuaries greater insight into the claims process.
 - Allow inflation to be incorporated in unpaid claims estimates.
 - **Cons:**
 - Incorrect assumptions about inflation result in inaccuracy.
 - Require detailed data.
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Frequency-Severity Technique #1

Apply the development technique separately to claim counts and claim severities.

KEY ASSUMPTIONS:

1. Claim counts and severities recorded to date will continue to develop in a similar fashion in the future.
2. Claim counts have a consistent definition throughout the experience period.
3. The mix of claim types is reasonably homogenous.

TECHNIQUE

1. Project and select ultimate claim counts.

2. Project and select ultimate severity.
 3. Project ultimate claims as ultimate counts times ultimate severity.
 4. Compute unpaid claim/IBNR estimate (if needed).
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Frequency-Severity Technique #2

Utilize the development method while incorporating trend analysis for exposure, frequency, and severity. Especially useful when estimating the ultimate loss or IBNR for accident years that are relatively immature or have highly leveraged CDFs.

KEY ASSUMPTIONS

1. Claim counts and severities recorded to date will continue to develop in a similar fashion in the future.
2. Claim counts have a consistent definition throughout the experience period.
3. The mix of claim types is reasonably homogenous.

TECHNIQUE

1. Project ultimate claim counts.
2. Compare claim counts to exposures, and select ultimate frequency.
3. Project and select ultimate severity.
4. Project ultimate claims.

$$\text{AY Ult. Claims} = \frac{\text{AY Exposures} \times \text{Selected Frequency}}{\text{Projected Claim Counts}} \times \text{Selected Severity}$$

5. Compute unpaid claim/IBNR estimate (if needed).
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Disposal Rate Method

The **disposal rate** for a particular accident year at maturity t is the percentage of ultimate claim counts that have been closed at that maturity.

$$\text{AY Disposal Rate}_t = \frac{\text{AY Cumulative Closed Claim Counts}_t}{\text{AY Ultimate Closed Claim Counts}}$$

KEY ASSUMPTIONS

1. Claim counts and severities recorded to date will continue to develop in a similar fashion in the future.
2. Claim counts have a consistent definition throughout the experience period.
3. The mix of claim types is reasonably homogenous.
4. There are **no significant partial claim payments** made.

TECHNIQUE

1. Project and select ultimate claim counts by accident year.
2. Create disposal rate triangle and select disposal rates by maturity.
3. Project claim counts using the selected disposal rates.

$$\text{Closed Claim Counts Between } t_1 \text{ and } t_2 = \frac{\text{Open Claim Counts}}{1 - \text{Latest Selected DR}} \cdot (\text{Selected DR}_{t_2} - \text{Selected DR}_{t_1})$$

4. Analyze and select incremental severities by maturity.
5. Calculate incremental severities by maturity age and accident year.
6. Project unpaid claims by multiplying claim counts by severities.
7. Compute ultimate claim/IBNR estimate (if needed).

Tail Severities

The severities in the oldest maturity ages are often highly unstable, especially in the long-tailed lines of business. This is mainly due to thin data. In this case, we can consider combining the severities of multiple maturity ages and select a **tail severity**.

CONSIDERATIONS WHEN SELECTING A TAIL SEVERITY

- Combine data over the ages where the results become erratic.
- Consider the influence on the total projections of selecting a particular age.
- Consider the percentage of claims expected to be closed beyond the selected maturity.
- Consider potential distortions of large claims on the incremental average severities.