7.2 Summary

5m

Components of an Unpaid Claims Analysis

Berquist and Sherman note that actuaries should include the following elements in an unpaid claims analysis whenever possible:

- Projections of reported claims
- Projections of paid claims
- Projections of ultimate reported claim counts and severities
- Estimates of the number and average amount of outstanding claims
- Claim ratio estimates

In addition, they recommended that actuaries include concepts from credibility, regression analysis, and data smoothing in unpaid claims analyses in order to enhance the stability of any estimates.

Rather than performing detailed rate reviews each period, smaller companies tend to "roll forward" the results from the previous detailed analysis and approximate the changes between the current date and the date of the last analysis in order to get an up-to-date picture of their position.

Expected Emergence

- Expected Reported Emergence

$$\begin{aligned}\underset{\text{Between } t_1 \text{ and } t_2}{\text{Expected Rept. Claims}} &= \overbrace{\left(\begin{matrix}\text{Estimated}\\ \text{Ult. Claims}\end{matrix} - \begin{matrix}\text{Latest}\\ \text{Rept. Claims}\end{matrix}\right)}^{\text{Estimated IBNR}} \times \frac{t_2 - t_1}{1 - \text{Latest}} \\ &= \left(\begin{matrix}\text{Estimated}\\ \text{Ult. Claims}\end{matrix} - \begin{matrix}\text{Latest}\\ \text{Rept. Claims}\end{matrix}\right) \times \frac{\frac{1}{\text{Rept CDF}_{t_2}} - \frac{1}{\text{Rept CDF}_{t_1}}}{1 - \frac{1}{\text{Latest Rept CDF}}}\end{aligned}$$

- Expected Paid Emergence

$$\text{Expected Paid Claims Between } t_1 \text{ and } t_2 = \overbrace{\left(\begin{matrix}\text{Estimated} \\ \text{Ult. Claims}\end{matrix} - \begin{matrix}\text{Latest} \\ \text{Paid Claims}\end{matrix}\right)}^{\text{Estimated Unpaid Claims}} \times \overbrace{\frac{t_2 - t_1}{1 - \text{Latest}}}$$

$$= \left(\begin{matrix}\text{Estimated} \\ \text{Ult. Claims}\end{matrix} - \begin{matrix}\text{Latest} \\ \text{Paid Claims}\end{matrix}\right) \times \frac{\frac{1}{\text{Paid CDF}_{t_2}} - \frac{1}{\text{Paid CDF}_{t_1}}}{1 - \frac{1}{\text{Latest Paid CDF}}}$$

Options for Handling a Discrepancy in IBNR

1. **Leave the IBNR reserve as is**: For example, this would be appropriate if we believed that the excess reported claims were due to random fluctuation, such as an unusually large loss, but that future development would return to expected levels.

2. **Increase the IBNR reserve**: For example, this would be appropriate if we believed that the excess reported claims were due to an increasing claims ratio.

3. **Decrease the IBNR reserve**: For example, this would be appropriate if we believed that the excess reported claims were due to an increase in the report rate.

Interpolating Between Dates

- When claims are uniformly reported or paid between maturities, we can linearly interpolate between the two neighboring quantities.
    - Fairly accurate when the difference between maturities is small.
- In practice, claims tend to develop faster at the start of a period and slower toward the end.