

8.3 Summary

Dollar-Based Techniques

Dollar-based techniques relate ULAE dollars to claim dollars. ULAE expenditures are assumed to follow the general timing of claims (reported or paid) and are proportional to their size.

Classical (Traditional) Approach

MECHANICS

1. Calculate the historical ratio of paid ULAE-to-paid claims, W_C , for each calendar year.

$$W_C = \frac{\text{CY Paid ULAE}}{\text{CY Paid Claims}}$$

2. Analyze the historical ratios for any trends or patterns.
3. Choose an ULAE-to-claims ratio, W_C^* .
4. Estimate the unpaid ULAE.

$$\text{Unpaid ULAE} = W_C^* \times [\text{Pure IBNR} + 0.5 (\text{Case Outstanding} + \text{IBNER})]$$

KEY ASSUMPTIONS

- The ratio of paid ULAE-to-paid claims is stable enough such that it can reasonably estimate the ultimate ULAE-to-ultimate claims relationship.
- The future activity and cost associated with managing claims that have not been reported yet are directly proportional to pure IBNR, and those that have been reported but not yet closed are directly proportional to case outstanding and IBNER.
- 50% of ULAE costs occur when a claim is opened and 50% when a claim is closed.

Mango-Allen Refinement

The Mango-Allen refinement is nearly identical to the classical technique except that instead of using the actual calendar period claims, expected paid claims are used:

$$W_M = \frac{\text{CY Paid ULAE}}{\text{CY Expected Paid Claims}}$$

Kittel Refinement

In this approach, the ratio, W_K , is defined as:

$$W_K = \frac{\text{CY Paid ULAE}}{0.5 (\text{CY Paid Claims} + \text{CY Incurred Claims})}$$

where:

$$\begin{aligned} 0.5 (\text{CY Paid Claims} + \text{CY Incurred Claims}) = & \text{Claims Opened and Paid} \\ & + 0.5 (\text{Payments on Prior Outstanding}) \\ & + 0.5 (\text{Claims Opened Remaining Open}) \end{aligned}$$

Note that in this approach, the term "incurred claims" includes both reported and IBNR claims. Thus, it also equals the paid claims plus the change in **total** reserves, including both case outstanding and IBNR.

KEY ASSUMPTIONS

- ULAE is sustained as claims are reported even if no claim payments are made.
- ULAE payments for a specific calendar year are related to both the reporting and payment of claims.

Generalized Approach

In the generalized approach, three weights, U_1 , U_2 , and U_3 , are defined as follows:

- U_1 is the percent of ultimate ULAE spent in opening claims
- U_2 is the percent of ultimate ULAE spent in maintaining claims
- U_3 is the percent of ultimate ULAE spent in closing claims
- $U_1 + U_2 + U_3 = 100\%$

This method estimates the ULAE-to-claims ratio, W , for each calendar year as the paid ULAE, M , divided by the claims basis, B :

$$W = \frac{M}{B}$$

where B is calculated as:

$$B = (U_1 \times R) + (U_2 \times P) + (U_3 \times C)$$

and R , P , and C are defined as:

- R - ultimate cost of claims reported during the calendar year
- P - paid claims during the calendar year
- C - the ultimate cost of claims closed during the calendar year

Unpaid ULAE can then be estimated using any of the following approaches:

Approach	Unpaid ULAE
Bornhuetter-Ferguson	$W^* \times (L - B)$
Expected Claims	$(W^* \times L) - M$
Development	$M \times \left(\frac{L}{B} - 1 \right)$

where L is the ultimate claims for an accident year.

KEY ASSUMPTIONS

- ULAE expenses are directly tied to the dollar amount of claims being handled.
- ULAE amounts spent when opening claims are proportional to the ultimate cost of those claims when reported.

- ULAE amounts spent during the maintenance of claims correspond to the payments made during their handling.
- ULAE expenses for closing claims are proportionate to the final cost of the claims being closed.

Simplified Generalized Approach

This approach estimates the claim basis, $B_{estimate}$, by replacing R with L and letting $U_3 = 0$:

$$B_{estimate} = (U_1 \times L) + (U_2 \times P)$$

W is defined as:

$$W = \frac{M}{B_{estimate}}$$

Then, the following formula is used to estimate the unpaid ULAE:

$$\begin{aligned} \text{Unpaid ULAE} &= W^* \times [U_1 \times \text{Pure IBNR} + U_2 \times (\text{Case Outstanding} + \text{IBNER} + \text{Pure IBT})] \\ &= W^* \times [\text{Pure IBNR} + U_2 \times (\text{Case Outstanding} + \text{IBNER})] \end{aligned}$$

The classical and Kittel approaches are just specific cases of the generalized approach.

Count-Based Techniques

Count-based techniques assume that the cost of each claims transaction is the same regardless of claim size and that a claim which is open longer will cost more.

- The **Brian technique** projects future transaction volumes and assumes similar ULAE costs for the five transaction types (initiating, managing, disbursing, concluding, and reopening claims) based on historical ULAE-to-transaction volume ratios.
- The **Wendy Johnson technique** follows a similar approach to Brian's technique but instead focuses on two key transactions: reporting and maintenance.
- The **Mango-Allen claim staffing technique** works by estimating the future staff count needed to handle claims and then multiplying by the future ULAE per claim staff member.

- **Kay Kellogg Rahardjo** introduces a specialized pricing method for claims-handling services, particularly aimed at Third-Party Claims Administrators (TPAs). She also points that as claim duration prolongs, the cost of managing the claim over its remaining lifespan also increases.
- **Spalla** advocates utilizing advanced claim information systems to track employees' time on individual claims. Spalla's method enables the calculation of average ULAE per transaction type, including overhead costs, and provides relative cost comparisons.

The **generalized approach** can also be adapted to claim counts as follows:

$$w = \frac{M}{b}$$

where the claim count basis, b , can be calculated as:

$$b = (v_1 \times r) + (v_2 \times o) + (v_3 \times c)$$

This relies on the following inputs:

- r = reported claim counts
- o = open claim counts
- c = closed claim counts
- v_1 = relative cost of handling the reporting of a claim
- v_2 = relative cost of managing an open claim
- v_3 = relative cost of closing a claim

Select w^* , or a series of w_i^* terms, which can be different for each calendar year to take inflation into account. Then, the unpaid ULAE can be estimated as:

$$\text{Unpaid ULAE} = \sum_i w_i^* \times [(v_1 \times r_i) + (v_2 \times o_i) + (v_3 \times c_i)]$$

where:

- r_i is the number of claims reports in calendar year i
- o_i is the number of open claims at the end of calendar year i
- c_i is the number of claims to be closed during calendar year i

Triangle-Based Techniques

While not commonly utilized, triangle-based techniques can also be used to estimate unpaid ULAE.

- **Triangle-Based Development Techniques.** In this method, actuaries allocate paid ULAE in previous calendar years to accident years. It will be inaccurate if the allocations are incorrect or altered over time.
- **Slifka's Method (Time-and-Motion Study Approach).** The Slifka method recommends employing a time-and-motion study to understand how resources are allocated between managing the current accident year's claims and the prior accident year's claims.
- **Paid ULAE Triangles Based on Time and Motion Studies.** This creates a ULAE triangle, and traditional development techniques can then be applied to estimate ultimate ULAE and indicated unpaid ULAE.