
LAE RESERVING

SEMINAR SESSION III

Supplementary Questions and Solutions

**All 10 Actuarial Seminars
Fall 2008 CAS Exam 6**

SYLLABUS READINGS REFERENCED

<u>Author(s)</u>	<u>Article Name</u>
Conger/Nolibos	Estimating ULAE Liabilities

Forecasting ULAE Reserves

"Estimating ULAE Liabilities: Rediscovering and Expanding Kittel's Approach" by Conger & Nolibos ("Conger")
"Loss Reserving" by Wisner, R.F.; Cockley, J.E; and Gardner A. ("Wisner")

I. Introduction

II. Dollar Based Methods

- II-1) Overview and Required Data, *as provided in Exhibits A.1 and A.2*
- II-2) Traditional (Classical Paid-to-Paid) Method, *as illustrated in Exhibit B*
- II-3) Kittel's Refinement to the Classical Method, *as illustrated in Exhibit C*
- II-4) Generalized Method with Simplification, *as illustrated in Exhibit F*
- II-5) Generalized Method without Simplification, *as illustrated in Exhibits D and E*
- II-6) Mango-Allen Smoothing

The main point of Conger is to introduce these Generalized methods

III. Count Based Methods

IV. Triangle-Based and other Methods

V. Practical Difficulties (in particular, for the generalized methods)

Key Notation Reference: (Conger also uses "Loss" to refer to "Loss & ALAE")

"M" is the \$ ULAE paid during a calendar year

"P" is the \$ Loss&ALAE paid during a calendar year

"A" is the estimated ultimate \$ Loss&ALAE for an individual accident year

"L" is the estimated ultimate \$ Loss&ALAE for the **group** of accident years

"R" is the ultimate cost \$ of claims that were opened during the period

"C" is the ultimate cost \$ of claims that were closed during the period

U_1 is the % of ultimate ULAE related to opening claim files . . . For use with "R"

U_2 is the % of ultimate ULAE related to maintaining (and paying) claims . . . For use with "P"

U_3 is the % of ultimate ULAE related to closing claim files . . . For use with "C"

"W" is the ratio of ULAE to Loss&ALAE *by year*, and "W*" is the *overall selected* ratio

"B" is the \$ Loss Basis (denominator of W), conceptually "the value of claims underlying the ULAE payments"

"U" is the \$ Ultimate ULAE

I. Introduction to Forecasting ULAE Reserves

In addition to the estimation of Loss & ALAE reserves, Wisner says ". . . we must also estimate the liability for unallocated loss adjustment expenses. Most ULAE is the expense of operating a claims department and includes such items as claims adjusters fees, office rent and utilities." (page 265)

Since ULAE is not allocated to-or recorded for-individual accidents, the traditional methods we saw for estimating loss reserves (Developing Triangles by Accident Year) cannot be applied directly to ULAE. Instead, the techniques that are used to estimate outstanding ULAE are different from the procedures for estimating Loss and ALAE reserves. Both Wisner and Conger discuss methods of forecasting ULAE.

Comment on ULAE (unallocated loss adjustment expenses) vs AOE (Adjusting and Other Expenses):

The terms ULAE and AOE are closely related and are often used almost interchangeably, as are ALAE (Allocated Loss Adjustment Expenses) and DCC (Defense and Cost Containment Expenses). Conger draws attention to the different categories in the "Practical Difficulties" section and explains:

"The methods described in this paper could be applied to traditional ULAE, to the new "Other Adjusting" expenses, to the individual component activities and expenses that comprise these broader categories of loss adjustment expense, or to historical loss adjustment expenses reclassified to approximate the current Defense and Cost Containment and Other Expense definitions. These methods could also be applied to the whole, or components of, ALAE or its statutory replacement, "Defense and Cost Containment" expenses, although likely using different weighting parameters." (page 124)

Conger describes several methods of estimating ULAE reserves. Consider three categories:

1) Dollar-Based Methods

These methods involve ULAE ratios based on aggregate Loss&ALAE data. They are discussed in Section II.

They are based on the fundamental assumption that ULAE expenditures track with loss dollars. (page 97)

- General timing of ULAE expenditures follows the timing of the reporting or paying of loss dollars.
- ULAE costs of a claim vary in direct proportion to the size of Loss&ALAE costs of the claim.

Examples:

Traditional or Classical Paid-to-Paid Method (described in Wisner as well as Conger)

Kittel's Refinement to the Classical Method

Mango-Allen Smoothing Adjustment (mentioned, but not covered in any depth)

Generalized Method (with or without simplification)

2) Count-Based (or Transaction-based) Methods

These methods require more detailed claim count and activity-cost data. They are discussed in Section III.

The key assumption is that similar activities ("transactions") lead to the same amount of ULAE, regardless of the claim size.

Activities may include setting up a new claim file, maintaining claim files, issuing payments for the claims, closing the files.

Examples:

Early Methods, i.e. Brian's method described by Skurnick

Wendy Johnson Method (requires only *relative* amounts of resources used by transaction type)

Rahardo and Mango-Allen (costs varying over time)

Spalla (quantifying transaction costs)

Conger also describes how the generalized method could be adapted to be a count-based method

3) Triangle-Based and other Methods

These methods are discussed in Section IV, and are analogous to traditional triangle projections for Loss & ALAE, **but** unlike Losses&ALAE, which can be directly allocated to the year the loss occurred, ULAE is (by definition) unallocated.

Triangles of Paid ULAE are *created** by accident year, and evaluated for development factors to estimate ULAE reserves.

**The complication is that the ULAE must first be allocated to Accident Year, to create or build the triangle.*

That is, we first must decide how to allocate the ULAE into accident years, and then we create and evaluate the triangles.

For this reason, triangle-based methods are less commonly used as a method to estimate ULAE reserves.

Examples of ways to create ULAE triangles:

Allocating ULAE to Accident Year (AY), using the pattern of claim payments.

Allocating the historical ULAE to Accident Year (AY), based on time-and-motion studies, as in Slifka.

Allocating ULAE to AY, using restated historical allocations, incorporating current studies and assumptions.

II-1) Dollar Based Methods: Overview and Required Data

The Dollar-Based methods calculate ULAE based on ratios to aggregate Loss&ALAE. They are based on the fundamental assumption that ULAE expenditures track with loss dollars.

Idea:

We already have estimated unpaid Loss&ALAE amounts, so we have Loss&ALAE reserves established in the form of case reserves and IBNR.

IBNR reserves are made up of two components: IBNER and IBNYR. Only the IBNYR is actually for losses not yet reported. The IBNER is a bulk amount to supplement the case reserves, in case they are not "enough." Separating the IBNR into its parts can be difficult, and in fact: that the simpler methods in the examples do not. More detail below and on pg 99 of Conger.

To estimate unpaid ULAE using a dollar method, we are going to work directly from those Loss&ALAE reserves to estimate ULAE reserves.

We can think of the most of the dollar-based methods as 2 steps:

a) Calculate a ratio "W" by measuring historical ULAE against a measure of historical Loss&ALAE

For the numerator, use paid ULAE by calendar year (Note: we can track ULAE *paid* during the course of a year, but not "reported")

The measure of historical Loss&ALAE forms the denominator of ratio (loss basis), and will vary by method.

b) Apply the ratio "W" to the Unpaid Loss&ALAE amounts, to estimate the indicated ULAE reserve

For a basic illustration, assume 60% of ULAE is associated with opening a claim, and 40% is associated with closing the claim.

Once we have the ratio W from step a), we can think of applying W to the Loss&ALAE reserves in 2 parts:

- 1) Loss&ALAE Reserves for claims that we've already opened files for: **Case Reserves + IBNER** (incurred but not enough reported)
SOME of the ULAE for these claims has already been paid, since the claims department set up files, etc. when the claim was reported.
To estimate the unpaid ULAE, we only want to reserve for the amount that we are expecting to pay in the future, when we close the claim.
Here, 60% of ULAE was paid when the claim is reported, and **the other 40%** of the ULAE remains unpaid (to be included in reserve).
- 2) Reserve for Loss&ALAE for losses that have happened, but haven't been reported as claims yet: **IBNYR** (incurred but not yet reported).
NONE of the paid ULAE is associated with these claims, since the claims department has done no work at all for them yet..
That is, for the claims underlying the IBNYR, **100%** of the associated ULAE is unpaid (to be included in reserve).
To find the indicated ULAE reserve, we add the two pieces: **40%(Case Reserves + IBNER)*W + 100%(IBNYR)*W**

"The formula" for finding ULAE reserves using Dollar-Based Methods is: See Conger's page 99 on this "more correct application" *

$$[(\text{Est. \% of ULAE Unpaid on Reported Claims}) \times (\text{Case Reserves} + \text{IBNER}) \times (\text{ULAE ratio})] + [(100\%) \times (\text{IBNYR}) \times (\text{ULAE ratio})]$$

* Note: The Traditional and Kittel Refined methods, as shown in Congers Exhibits, both assume IBNR is all IBNYR and no IBNER. So for those methods, we will show a simplified formula.

Data Requirements (organized to align with the two steps above)

a) To calculate a ratio W, we need to have data for both the numerator and the denominator

The numerator of ratio, for all the dollar-based methods, is the same: Paid ULAE by Calendar Year

The denominator of ratio will vary by method. The required data grows as the method becomes more generalized

b) Apply the ratio "W" to the Unpaid Loss&ALAE amounts, to estimate the indicated ULAE reserve

Recall there are many ways to describe the "Unpaid Loss&ALAE" amounts:

$$\text{Unpaid Loss\&ALAE} = \text{Total Loss\&ALAE Reserves} = \text{Case Reserves} + \text{IBNR} = \text{Case Reserves} + \text{IBNER} + \text{IBNYR}$$

To use the dollar based methods to estimate ULAE reserves, we must have the corresponding Loss&ALAE reserves:

In the simpler methods, we will see that we can get by with just the Case Reserves and IBNR.

But, as the method becomes more generalized we will need data/assumptions to differentiate between the IBNER and IBNYR.

Before demonstrating the Dollar-Based Methods, we review the data provided for Conger's Exhibits.