

Estimating ULAE Liabilities

Rediscovering and Expanding Kittel's Approach

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Discussion Outline

- **The Problem**
- **The Specific Solution — ULAE Ratio**
- **Generalized Solution — ULAE Ratio**
- **ULAE Reserves — Three Methods**
- **The Weighting Parameters**
- **Difficulties and Future Refinements**

The Problem

XYZ Company ULAE Reserve for Workers Compensation

The Problem: XYZ Company ULAE Reserves

- Standard paid-to-paid ratios not well behaved
- Traditional 50/50 assumption not appropriate
- Count-based methods not feasible

Standard paid-to-paid ratios not well behaved

XYZ Company — Workers Comp

Calendar Year	Cal. Year Paid ULAE	Cal. Year Paid Loss & ALAE	Paid-to-Paid ULAE Ratio
(1)	(2)	(3)	(4) = (2)/(3)
1997	\$1,978	\$4,590	.431
1998	4,820	14,600	.330
1999	8,558	38,390	.223
2000	12,039	58,297	.207
2001	13,143	86,074	.153
2002	15,286	105,466	.145
Total	\$55,824	\$307,417	.182

Traditional 50/50 assumption for ULAE payments

As stated: → 50% when claim is reported → 50% when claim is closed

As typically applied: → 50% when claim is reported → 50% as claim \$ closed

or → 50% as claim \$ recorded → 50% as claim \$ paid

XYZ Company → 60% – 70% when claim is reported → 30% – 40% as claim \$ paid

Larger claims require proportionately more ULAE than small claims

Traditional 50/50 assumption for ULAE payments

Other potential departures from traditional assumption:

- **Significant ULAE for other claim activities (e.g., reopening)**
- **ULAE split other than 50/50**
- **ULAE \$ not varying by claim size**

The Specific Solution

XYZ Company ULAE Ratio

ULAE Ratio Derivation

XYZ Company — Workers Comp

We believe:

CALENDAR YEAR

Paid ULAE \$ =

[ULAE ratio] x [60% to 70%] x [L+A \$ on claims reported]

+

[ULAE ratio] x [30% to 40%] x [L + A \$ paid]

Therefore:

ULAE Ratio = Paid ULAE \$ /

[60% to 70%] x [L + A \$ on claims reported]

+

[30% to 40%] x [L + A \$ paid]

ULAE Ratio Calculation

XYZ Company — Workers Comp

60/40 ASSUMPTION

Calendar Year	Cal. Year Paid ULAE	Est. RY Ultimate Loss & ALAE	Cal. Year Paid Loss & ALAE	Loss Basis	ULAE Ratio
(1)	(2)	(3)	(4)	(5*)	(6)=(2)/(5)
1997	\$1,978	\$27,200	\$4,590	\$18,156	.109
1998	4,820	76,700	14,600	51,860	.093
1999	8,558	106,900	38,390	79,496	.108
2000	12,039	154,300	58,297	115,899	.104
2001	13,143	163,100	86,074	132,290	.099
2002	15,286	176,400	105,466	148,026	.103
Total	\$55,824	704,600	\$307,417	\$545,727	.102

* (5) = 60% x (3) + 40% x (4)

Projected AY Ultimate Loss + ALAE = \$713,400

ULAE Ratio — Sensitivity to Weights

XYZ Company — Workers Comp

Calendar Year	ULAE Ratio 60/40 Weights	ULAE Ratio 70/30 Weights
1997	.109	.097
1998	.093	.083
1999	.108	.099
2000	.104	.096
2001	.099	.094
2002	.103	.099

Total

.102

.095

Selected .100

An acceptable simplification?

**Ultimate
L+A \$ on claims reported
during calendar period**

=

**Ultimate
L+A \$ on claims occurring
during calendar/accident
period**

-

△ Pure IBNR during period

**Ultimate
L+A \$ on claims reported
during calendar period**

?
≈

**Ultimate
L+A \$ on claims occurring
during calendar/accident
period**

Kittel's simplification

Ultimate
L+A \$ on claims reported
during calendar period

=

Paid losses during period
+
△ Case reserves during
period

+

△ IBNR during period

Ultimate
L+A \$ on claims reported
during calendar period

?

Paid losses during period
+
△ Case reserves during
period

Note: Kittel also assumes:
- *Payment = Closing*
- *50/50 Weights*

Generalized Solution — ULAE Ratio

Generalized solution — ULAE ratio

**U % of Ultimate ULAE
is Spent**

Modeling Based On:

U_1 % opening claims

■ **Ultimate cost of claims reported during period**

U_2 % maintaining claims

■ **Claim payments during period**

U_3 % closing claims

■ **Ultimate cost of claims closed during period**

Note: $U_1 + U_2 + U_3 = 100\%$

Generalized solution — ULAE ratio

**[ULAE \$ Paid
During Period]**

/

$$\left\{ \begin{array}{l} U_1\% \times \text{Ultimate cost of claims reported during period} \\ + \\ U_2\% \times \text{Claim payments during period} \\ + \\ U_3\% \times \text{Ultimate cost of claims closed during period} \end{array} \right.$$

Note: $U_1 + U_2 + U_3 = 100\%$

ULAE Reserves — Three Methods

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- [Expected Ultimate] minus [Paid]
- [Expected unpaid]
- Multiple of [Paid to date]

All three methods use the selected ULAE ratio

ULAE Reserves — Three Methods

60/40 ASSUMPTION

■ Accident year loss + ALAE	
Key totals	
■ Projected Ultimate	\$ 713,400
■ Pure IBNR	8,800
■ Projected Ultimate on known claims	704,600
■ Paid loss + ALAE	307,417
■ Loss basis	545,727
(60% x 704,600) + (40% x 307,417)	
■ Paid ULAE	55,824
■ Selected ULAE Ratio	.100

ULAE Reserves — Three Methods

60/40 ASSUMPTION

ULAE Reserve

- Expected ultimate minus paid:
 $(.10 \times 713,400) - (55,824) = 15,516$
- Expected unpaid:
 $(.10) \times (713,400 - 545,727) = 16,767$
- Multiple of paid to date:
 $55,824 \times (713,400 \div 545,727 - 1.0) = 17,152$

ULAE Reserves — Three Methods

XYZ Company — Workers Comp

	<u>60/40</u> <u>Assumption</u>	<u>70/30</u> <u>Assumption</u>
■ Expected ultimate minus paid	15,516	15,516
■ Expected unpaid	16,767	12,795
■ Multiple of paid to date	17,152	12,201

Using ULAE ratio = .100

The Weighting Parameters

U₁, U₂, and U₃

- **Interview**
- **“Time and Motion” studies**
- **Computer-based activity analysis**
- **Sensitivity testing**

Difficulties and Future Refinements

Future Refinements

- **Can add additional activities (e.g., reopening)**
 - **Need \$ measure of volume**
 - **Select weight**
- **Replace \$ with counts to produce Wendy-Johnson method [ULAE effort not related to size of claim]**
- **Stratify claims into subpopulations for which**
 - **ULAE is “strictly” proportional to claim size or**
 - **ULAE is “strictly” independent of claim size**

Other Difficulties

- **Changing definitions of LAE**
- **ULAE resource needs vary over the life of claim**
- **Inflation**

Recap of Calculation Example

ULAE Ratio Calculation

XYZ Company — Workers Comp

60/40 ASSUMPTION

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