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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
- Estimating Unpaid ULAE
- The Weighting Parameters
- Difficulties and Potential Refinements
- Example: ULAE Related to Claim Reporting and Managing Open Claims

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

XYZ Company — Workers' Comp

Standard paid-to-paid ratios not well behaved

Calendar Year	Cal. Year Paid ULAE	Cal. Year Paid Loss & ALAE	Paid-to-Paid ULAE Ratio
(1)	(2)	(3)	(4) = (2)/(3)
2001	$1,978	$4,590	.431
2002	4,820	14,600	.330
2003	8,558	38,390	.223
2004	12,039	58,297	.207
2005	13,143	86,074	.153
2006	15,286	105,466	.145
Total	**$55,824**	**$307,417**	**.182**

Note: ($000's).

XYZ Company — Workers' Comp

Standard paid-to-paid ratios not well behaved

- Why not?
- Many important ULAE activities…
  - Are related to activities other than making claim payments
  - Occur at times other than when claim payments occur
- Mismatch is most evident for a company undergoing rapid growth, shrinkage, or other major changes
  - But underlying issue also exists for steady-state company

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

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

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

Traditional 50/50 assumption for ULAE payments

Other potential departures from traditional assumption:

- Significant ULAE for other claim activities
  - Interim claim management activities on liability claims
  - Claim closure activities versus claim payment activities
  - Reopenings
- ULAE split other than 50/50
- ULAE $ not varying by claim size

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**

The Specific Solution — ULAE Ratio

Replace “paid loss” as the explanatory variable

- Identify claim activity measures that ARE responsive to the timing and intensity of ULAE activity
  - Claim reporting (traditional: 50%)
  - Ongoing management of open claims
  - Claim payment activity (traditional: 50%)
  - Claim closure activity
- To what extent is ULAE activity proportional to the size of the claim?
  - Consider claim count versus claim dollar measures

XYZ Company — Workers' Comp

ULAE ratio derivation

CALENDAR YEAR

We believe:

Paid ULAE $ =

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

+

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

Therefore:

ULAE Ratio = Paid ULAE $ /

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

+

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

XYZ Company — Workers' Comp

ULAE ratio calculation

60/40 ASSUMPTION

Calendar Year	Cal. Year Paid ULAE	Est. RY Ultimate Loss & ALAE	Cal. Year Paid Loss & ALAE	ULAE Basis	ULAE Ratio to ULAE Basis
(1)	(2)	(3)	(4)	(5*)	(6)=(2)/(5)
2001	$1,978	$27,200	$4,590	$18,156	.109
2002	4,820	76,700	14,600	51,860	.093
2003	8,558	106,900	38,390	79,496	.108
2004	12,039	154,300	58,297	115,899	.104
2005	13,143	163,100	86,074	132,290	.099
2006	15,286	176,400	105,466	148,026	.103
Total	**$55,824**	**$704,600**	**$307,417**	**$545,727**	**.102**

Note: ($000's).
*(5) = 60% x (3) + 40% x (4)

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XYZ Company — Workers' Comp
ULAE ratio — Sensitivity to weights

Calendar Year	ULAE Ratio 60/40 Weights	ULAE Ratio 70/30 Weights
2001	.109	.097
2002	.093	.083
2003	.108	.099
2004	.104	.096
2005	.099	.094
2006	.103	.099
Total	**.102**	**.095**

Selected .100

XYZ Company — Workers' Comp
Standard paid-to-paid ratios not well behaved

Calendar Year	Cal. Year Paid ULAE	Cal. Year Paid Loss & ALAE	Paid-to-Paid ULAE Ratio
(1)	(2)	(3)	(4) = (2)/(3)
2001	$1,978	$4,590	.431
2002	4,820	14,600	.330
2003	8,558	38,390	.223
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2005	13,143	86,074	.153
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An acceptable simplification?

Ultimate
L+A $ on claims reported during calendar period

=

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

−

Δ Pure IBNR during period

Ultimate
L+A $ on claims <u>reported</u> during calendar period

≈ ?

Ultimate
L+A $ on claims <u>occurring</u> during calendar/accident period

Note: ($000's).

Compare Kittel's use of calendar year incurred $

Ultimate L+A $ on claims reported during calendar period	=	Paid losses during RY, on RY claims + Case reserves at end of RY on RY claims + Future payment and case reserve activity on current RY claims
Versus Kittel Calendar year Incurred L+A:	=	Paid losses during RY on RY claims + Case reserves at end of RY on RY claims + Payment and case reserve activity during RY on prior RY claims

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

"RY" = Report Year

Generalized Solution — ULAE Ratio

Generalized solution — ULAE ratio

% of Ultimate ULAE 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]

/

U_1% x — Ultimate cost of claims reported during period

+

U_2% x — Claim payments during period

+

U_3% x — Ultimate cost of claims closed during period

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

Estimating Unpaid ULAE

Estimating Unpaid ULAE

Recall our key assumption:

Paid ULAE $ =

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

+

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

Therefore:

Unpaid ULAE =

[60% to 70%] x [ULAE Ratio] x [Pure IBNR L + A $]

+

[30% to 40%] x [ULAE Ratio] x [L + A $ unpaid]

XYZ Company — Workers' Comp

ULAE ratio calculation

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)
2001	$1,978	$27,200	$4,590	$18,156	.109
2002	4,820	76,700	14,600	51,860	.093
2003	8,558	106,900	38,390	79,496	.108
2004	12,039	154,300	58,297	115,899	.104
2005	13,143	163,100	86,074	132,290	.099
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Total	**$55,824**	**$704,600**	**$307,417**	**$545,727**	**.102**

Note: ($000's).
*(5) = 60% x (3) + 40% x (4)

Projected AY Ultimate Loss + ALAE = $713,400

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XYZ Company — Workers' Comp
Unpaid ULAE – key inputs

60/40 ASSUMPTION

Accident year loss + ALAE ($000's)

- Key totals
  - Projected Ultimate $713,400
  - Projected Ultimate on known claims 704,600
  - Pure IBNR 8,800
  - Paid loss + ALAE 307,417
  - Unpaid loss + ALAE incl pure IBNR 405,983

Selected ULAE Ratio .100

XYZ Company — Workers' Comp
Estimated Unpaid ULAE

60/40 ASSUMPTION

ULAE Reserve ($000's)

- Expected unpaid:
  (.10) x (60%) x (8,800) future reporting activity

  +

  (.10) x (40%) x (405,983) future payment activity

- Equivalently, may be expressed as

  (.10) x (8,800) lifetime ULAE on IBNR claims

  +

  (.10) x (40%) x (704,600 – 307,417) future payment activity on known claims

  = $16,767

Unpaid ULAE $ calculation more sensitive than ULAE ratio calculation

- For a steady state company, it is typical that
  - Calendar year paid losses
  - Calendar year paid plus case losses
  - Accident year ultimate losses
  - Report year ultimate losses

  Are similar in magnitude
- Therefore, alternative formulations of the ULAE ratio may not have much impact on the final ULAE reserve
- However, applying a percentage other than 50% to the unpaid losses has a direct proportional impact on the final ULAE reserve

The Weighting Parameters

U_1, U_2, and U_3

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

Difficulties and Potential Refinements

Potential refinements

- Can add additional activities (e.g., reopening)
  - Need $ measure of volume
  - Select weight
- Use “inventory” rather than “volume” measures of losses to model ULAE (e.g., case reserves rather than paid losses)
  - Complicates ULAE reserve calculation considerably
- Replace $ with counts to produce Wendy Johnson equivalent 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
- Changes in claim department operations

Example: ULAE Related to Claim Reporting and Managing Open Claims

ABC Company — General Liability
ULAE is related to claim reporting and managing open claims

- For this company, we believe the major claim activities that explain the consumption of ULAE resources are:
  - Initial activity when claim is reported
  - Managing claims that are open
- We believe that the amount of ULAE resources required are generally related to the size of the claim
- We have estimated that the amount of ULAE resource required to manage $1 of losses in years 2+ is 40% of the amount required to manage $1 of losses in the year the claim is reported

ABC Company — General Liability

ULAE ratio calculation

100/40 ASSUMPTION

Calendar Year	Cal. Year Paid ULAE	Est. RY Ultimate Loss & ALAE	Case Reserve Loss & ALAE (begin of yr)	ULAE Basis	ULAE Ratio
(1)	(2)	(3)	(4)	(5*)	(6)=(2)/(5)
2001	$112,117	$934,120	$1,786,643	$1,648,777	.068
2002	107,618	725,055	1,976,713	1,515,740	.071
2003	70,603	523,137	1,735,394	1,217,294	.058
2004	67,736	511,952	1,542,443	1,128,930	.060
2005	72,471	561,290	1,300,918	1,081,657	.067
2006	63,496	521,446	1,216,084	1,007,880	.063
Total	**494,041**	**3,777,000**	**9,558,195**	**7,600,278**	**.065**

Note: ($000's).
*(5) = (3) + 40% x (4)

Selected: .065

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ABC Company — General Liability
Unpaid ULAE — key inputs

Accident year 2006 and prior — loss + ALAE ($000's)

Key totals	
Pure IBNR @ 12/31/06	305,457
Projected case reserves @	
1/1/07 (actual 12/31/06)	1,198,597
1/1/08	1,001,362
1/1/09	750,135
…..	
1/1/20	2,172
1/1/21	0
TOTAL	3,039,915

Selected ULAE Ratio .065

ABC Company — General Liability
Estimated Unpaid ULAE

100/40 ASSUMPTION

ULAE Reserve ($000's)

- Estimated unpaid:

(.065) x ($305,457) initial year ULAE on IBNR claims

+

(.065) x (40%) x (3,039,915)

ongoing management of each year's open claims

= 98,892