Determination of Outstanding Liabilities for Unallocated Loss Adjustment Expenses

by Wendy Johnson

Little has been published to date on the determination of outstanding liabilities for unallocated loss adjustment expenses. The only method mentioned in the literature is the calendar year paid-paid method, and upon analysis it is apparent that this method will only give good results for very short-tailed, stable lines of business. This paper presents an estimation method which is significantly more flexible, based directly on claim reporting and closure patterns, and which takes into direct consideration changes in claim department operating cost levels. The paper describes the method using an example from medical malpractice insurance, and discusses and evaluates the sensitivity of the results to specific factors in the claim settlement environment.

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Little has been published to date on the determination of outstanding liabilities for unallocated loss adjustment expenses (ULAE). To a large extent, this is because the company management's and the actuary's attentions are usually directed to the much more important outstanding liabilities for losses and allocated loss adjustment expenses. However, when the subject does become the focus of attention for any reason, the actuary has few sources for ideas on how to estimate the liability.

The classical method has been to base the ULAE reserve on the ratio of calendar year ULAE payments to calendar year loss payments. Using the assumption that 50% of the ULAE is paid when the claim is opened and the other 50% when it is closed, the ULAE reserve is set by applying the 50% of the historical paid ULAE to paid loss ratio to the loss reserve, and 50% of the same ratio to the IBNR reserve. This method has been established by tradition dating from a dimly distant past when most lines had tails well under five years, cost inflation was slow and level, if it existed at all, and claim reporting and payment patterns were stable. We are no longer so fortunate as to live in this kind of environment, however, and our estimation methodologies should be adapted to fit the current environment, even for estimation of peripheral liabilities like ULAE.

The method to be presented in this paper relies on a claim reporting pattern and a claim closure pattern. The actuary must have available historical calendar year ULAE payments, historical numbers of open claims at year end, and historical numbers of

claims opened during the year. This data is somewhat more extensive than that required for the Annual Statement, but it is data that is also highly useful for evaluating loss reserves.

To see how the method is applied, we will consider an example from some medical malpractice data from a non-urban state with a relatively low level of litigation activity. Like many medical malpractice carriers, the company from which this data was derived was formed in the late 1970's, so the first several years of data presented arose while the company was just getting started.

Exhibit 1 shows the first several steps in application of the method. The underlying assumption is that ULAE will be incurred throughout the life of the claim, from the time that it is reported until it is closed, but that the effort associated with maintaining the claim file will be twice as great in the first year as in subsequent years. Thus, if there were no inflation in claim department expense levels, ULAE in the year the claim file is opened would be twice as great as in any subsequent year. This is of course not quite precise because it makes no allowance for the claims closed within the year. This could be of greater significance for lines with shorter tails than medical malpractice. One simple modification would be to use the average of the numbers of claims open at year end and the number of claims open at the previous year end. More sophisticated modifications could also be developed, and may be necessary in situations where the line of business is growing rapidly or there has been a change in the claim disposal rate.

The exhibit shows that historical calendar year ULAE payments from the Annual Statement are divided by the historical weighted numbers of open claims to determine the historical expense per open claim. The historical weighted numbers of open claims are the sums of the historical numbers of open claims at year end, and the historical numbers of claims opened during the year, in keeping with the underlying assumption stated above.

It should be noted that other assumptions about the relative ULAE payment levels throughout the life of the claim could very well be appropriate. The important point is that the method can easily be tailored to a variety of assumptions. The assumption used here seems to be appropriate for this body of data and the exposure from which it arose. This is borne out by the relative stability of the ratio of year-end numbers of open claims to weighted numbers of claims shown in the exhibit.

Exhibit 1 shows that the historical expenses per open claim for this company show a rather dramatic upward trend -- 17.4%. While a trend of this magnitude is not surprising for medical malpractice losses, it is surprising for ULAE. One of the first benefits of the method is that it highlights claim department cost levels from a possibly different viewpoint, and may help management to identify areas where costs are out of control.

Exhibit 2 shows the way the claims arising from accident years prior to December 31, 1986, the date at which the outstanding liability is being estimated, can be expected to be reported and settled, based on the claim reporting and closure patterns developed for the data. Again, the weighted totals are the sums

of the numbers of open claims at each year end and the numbers of claims opened during the year. The numbers of claims for each year have been rounded to the nearest whole number for realism. After 1991, it is assumed that no new claims will be reported, so the numbers of open claims at each year end are not adjusted.

It should be clear, from the year by year unfolding of the numbers of open claims at year end and numbers of claims opened during the year, that it is possible to assume more complicated claim reporting and payment patterns which allow for varying proportions of claims to be reported, reopened, and closed from year to year. For example, if tort reform legislation could be expected to reduce the numbers of claims reported after a certain date, that could be taken into consideration directly when using this method.

The estimated outstanding liability is calculated in Exhibit 3, based on the observed expense cost trend of 17.4% per year. The weighted numbers of open claims for each future year are multiplied by the estimated cost per claim for that year, and the total outstanding liability is the sum of the products for each year.

If it can be assumed that the company can control its expense cost levels more carefully, the method can easily be modified to allow for a lower expense cost trend. Exhibit 4 shows the outstanding liability that results if the assumed expense cost trend is 5%.

An example of the results of the method if the numbers of

late-reported claims are drastically reduced is given in Exhibit 5. The weighted numbers of open claims for each of the future years have been calculated assuming that only half as many claims will be reported after 12/31/86 for each accident year and reporting period.

Exhibit 6 shows the results of the application of the classical calendar year paid-paid method to the same body of data. Note that the observed historical ratio of ULAE payments to loss payments is very high, on the order of 20%. The ratio is so high because the ultimate loss dollars for each accident year are being paid out much more slowly than the unallocated expense dollars. This would tend typically to be true for very long-tailed lines like medical malpractice, but it would also be true for newly established or rapidly growing lines of business in highly inflationary loss cost environments.

The exhibit shows that the classical ULAE reserve is significantly greater than the outstanding liability estimated according to the method presented. This is the result of the very high observed ratio of ULAE to loss payments.

In conclusion, this paper has presented a method of calculating the outstanding liability for unallocated loss adjustment expenses. The method is straightforward, flexible, and makes use of relevant, readily available data. It also gives results significantly different from the classical method generally in use for the example shown. It should be noted, of course, that medical malpractice data typically has many extreme characteristics, but our actuarial methodologies should be

flexible enough to handle the extreme cases. In many respects, the extreme cases are the best tests of whether a model has been developed to a sufficient level of detail.

Calendar Year Expense Per Open Claim

Year	Paid ULAE from Page 11	Number of Open Claims at Year End	Number of Claims Opened During Year	Weighted Number of Open Claims	Ratio of Open to Wtd Claims	Expense Per Open Claim
	(a)	(b)	(c)	(d)	(e)	(f)
1977	$ 9,459	50	20	70	0.714	$ 135
1978	13,715	56	33	89	0.634	155
1979	19,886	75	49	124	0.606	161
1980	29,023	106	70	176	0.603	165
1981	42,355	156	80	236	0.661	179
1982	64,071	174	60	234	0.743	274
1983	78,898	199	63	261	0.761	302
1984	138,600	246	79	325	0.758	426
1985	214,991	359	114	473	0.759	455
1986	281,593	436	124	560	0.779	503
(g) 1987 Value Based on Fit of Data to Exponential Curve:						592
(h) Indicated Trend in Expenses per Open Claim:						17.4%

Notes:

(a) Calendar year ULAE payments from the Annual Statement.
(b) From Schedule P of the Annual Statement.
(c) From company records.
(d) (b)+(c). The assumption here is that a claim costs twice as much in absolute dollars to handle in the year it is opened than it does in subsequent years. This assumption seems to be borne out by this particular body of data. Other asuumptions may be more reasonable for other bodies of data.
(e) (b)/(d). The stability of this ratio in the most recent 5 years suggests that the assumed relative cost of claims over their lifetime is reasonable.
(f) (a)/(d)
(g) b=4.629, a=.160, r=.969.
(h) From exponential curve fit.

Numbers of Open Claims by Accident Year

Year	Number Open at 12/31/87	Number Opened in Year	Number Open at 12/31/88	Number Opened in Year	Number Open at 12/31/89	Number Opened in Year	Number Open at 12/31/90	Number Opened in Year	Number Open at 12/31/91
1977	3	0	1	0	0	0	0	0	0
1978	4	0	3	0	1	0	0	0	0
1979	4	0	3	0	3	0	1	0	0
1980	11	4	8	0	6	0	4	0	3
1981	11	0	9	0	6	0	5	0	4
1982	16	8	10	1	8	0	5	0	4
1983	41	5	25	1	15	1	11	0	9
1984	68	15	49	6	29	1	18	1	14
1985	95	44	65	15	49	6	28	1	18
1986	100	29	95	36	59	14	43	6	25
Totals	353	105	268	59	176	22	115	8	77
Weighted Totals		458		327		198		123	

Notes:

Based on the following claim reporting and closure patterns:

Year	% Reported	% Closed
1	46.5	0.8
2	64.4	2.3
3	86.8	27.9
4	95.3	58.9
5	99.2	72.9
6	100.0	84.5
7		89.9
8		93.0
9		94.6
10		96.1
11		97.7
12		98.4
13		99.2
14		100.0

Exhibit 2
Continued

Number of Open Claims by Accident Year

Year	Number Open at 12/31/92	Number Open at 12/31/93	Number Open at 12/31/94	Number Open at 12/31/95	Number Open at 12/31/96	Number Open at 12/31/97	Number Open at 12/31/98
1977	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0
1980	0	0	0	0	0	0	0
1981	1	0	0	0	0	0	0
1982	3	1	0	0	0	0	0
1983	6	4	3	0	0	0	0
1984	10	8	5	3	0	0	0
1985	13	9	8	5	3	0	0
1986	16	11	9	6	4	3	1
Totals	49	33	25	14	7	3	1

Exhibit 3

Estimated Outstanding Liability for ULAE

Year	Weighted Number of Open Claims	Expense Per Open Claim	Indicated ULAE Paid
	(a)	(b)	(c)
1987	458	$ 592	$ 271,136
1988	327	695	227,268
1989	198	816	161,556
1990	123	958	117,823
1991	79	1,125	88,843
1992	49	1,320	64,693
1993	33	1,550	51,150
1994	25	1,820	45,492
1995	14	2,136	29,908
1996	7	2,508	17,556
1997	3	2,944	8,833
1998	1	3,457	3,457
Total Estimated Outstanding Liability for ULAE as of 12/31/86:			$1,087,716

Notes:

(a) From Exhibit 2.
(b) Based on 17.4% expense level trend indicated by the data in Exhibit 1.
(c) (a)x(b)

Exhibit 4

Estimated Outstanding Liability for ULAE

Year	Weighted Number of Open Claims	Expense Per Open Claim	Indicated ULAE Paid
	(a)	(b)	(c)
1987	458	$ 592	$ 271,136
1988	327	622	203,263
1989	198	653	129,231
1990	123	685	84,294
1991	79	720	56,847
1992	49	756	37,022
1993	33	793	26,180
1994	25	833	20,825
1995	14	875	12,245
1996	7	918	6,429
1997	3	964	2,893
1998	1	1,013	1,013
Total Estimated Outstanding Liability for ULAE as of 12/31/86:			$ 851,377

Notes:

(a) From Exhibit 2.
(b) Based on an arbitrary expense level trend of 5%, under the assumption that the company can bring its expenses under control.
(c) (a)x(b)

Exhibit 5

Estimated Outstanding Liability for ULAE

Year	Weighted Number of Open Claims	Expense Per Open Claim	Indicated ULAE Paid
	(a)	(b)	(c)
1987	405	$ 592	$ 239,760
1988	244	695	169,408
1989	104	816	84,864
1990	25	958	23,948
1991	21	1,125	23,898
1992	18	1,320	23,105
1993	14	1,550	21,312
1994	10	1,820	18,197
1995	8	2,136	16,022
1996	5	2,508	12,540
1997	3	2,944	7,361
1998	1	3,457	3,457
Total Estimated Outstanding Liability for ULAE as of 12/31/86:			$ 643,662

Notes:

(a) From Exhibit 2.

(b) Based on the original expense level trend of 17.4%, and assuming that only half as many claims will be reported after the close of the accident year, for each accident year and report period.

(c) (a)x(b)

Exhibit 6

Indicated Classical ULAE Reserve

Year	Calendar Year Paid Losses	Calendar Year Paid ULAE	Paid to Paid Ratio
	(a)	(b)	(c)
1977	$ 17,341	$ 9,459	0.545
1978	51,969	13,715	0.264
1979	111,898	19,886	0.178
1980	215,746	29,023	0.135
1981	292,559	42,355	0.145
1982	396,168	64,071	0.162
1983	522,313	78,898	0.151
1984	694,288	138,600	0.200
1985	934,070	214,991	0.230
1986	1,265,029	281,593	0.223
Total/ Average	$4,501,379	$ 892,590	0.198

(d) Estimated Loss Reserve:	$12,458,095
(e) Estimated IBNR Reserve:	$ 7,575,485
(f) Indicated Classical ULAE Reserve:	$ 1,986,255

Notes:

(a) From Annual Statement.
(b) From Exhibit 1.
(c) (b)/(a). Obviously, averages other than the dollar-weighted could be selected if desired.
(d) From Annual Statement.
(e) From Annual Statement.
(f) (.5 x .198 x (d))+(.5 x .198 x (e))