

**UNALLOCATED LOSS ADJUSTMENT EXPENSE RESERVES**

**By**

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## Introduction

The purpose of this presentation is to provide an understanding of the basic techniques and considerations in establishing reserves for those claim related expenses that are classified as Unallocated Loss Adjustment Expenses (ULE). Standard ULE reserving methods are discussed, and examples illustrating the workings of the various approaches are presented.

### BACKGROUND

Unallocated Loss Adjustment Expenses (ULE) are those claim settlement costs that either can not or for practical reasons are not directly allocated by individual claim. For example, claim department salaries, travel, postage, rent, and equipment would be classified as ULE because under typical insurance company record keeping systems, these costs would not be associated with individual claims. On the other hand attorney fees, independent adjuster fees, doctor fees, court costs, and police report costs are classified as Allocated Loss Expense (ALE) because these costs are typically assigned to specific claims.

Our goal in establishing ULE reserves, for the purposes of this seminar, is to estimate the amount of ULE that is yet to be paid on claims that are either pending or claims that have been incurred but not yet reported (IBNR). To do this, ULE must somehow be associated to individual claims or at least category of claim (i.e. open or closed). Of course, by definition, accurate allocation is not possible - and this is the major obstacle in establishing accurate reserves for ULE, and the major difference between reserving for ULE and reserving for ALE.

To overcome this problem, and to establish reasonable ULE reserves, an attempt must be made to allocate ULE. The more accurate this "allocation", the more accurate will be the ULE reserves.

### "Brian Method"

Theoretically, through very sophisticated record keeping systems, it is possible to allocate to individual claims or category of claim (i.e. open/closed, by coverage, by age, by size, etc.) what today is typically considered to be ULE. For example the salaries of company field examiners could be allocated to individual claim by having the examiners keep track of their time spent on each claim. Telephone expenses could be similarly allocated. Corporate office salaries, rent, and equipment would be more difficult to allocate, but sophisticated methods could be devised to, as accurately as possible, allocate ULE to claim. From these allocations accurate ULE reserves can be established.

While this approach may lead to the most accurate means of reserving for ULE,, extensive work and expense would be required. For this reason very few companies, if any, go this far to reserve for ULE.

One method that is along these lines but does not go quite as far was set forth by R. E. Brian.

Under the "Brian Method", calendar year ULE payments are broken down by type of loss transaction: single payments, new claims, re-openings, closings, and pending claims. An average ULE payment per loss transaction is determined. This figure, adjusted for inflation, is then applied to an estimate of the loss transactions still to take place on all pending or IBNR claims to arrive at a ULE reserve estimate.

For example, if the average ULE paid per calendar month is \$10,000, and there are 1,000 loss transactions per month, then the average ULE per loss transaction is \$10. If 120 single payment loss transactions are projected to occur in 1984 and beyond relating to 1983 and prior accidents, then the single payment transaction portion of the ULE reserve is  $120 \times \$10 = \$1,200$ . This procedure would be followed for the other loss transactions to arrive at the total ULE reserve.

This method can be modified to vary the cost per transaction by type of transaction.

Unfortunately, this method also requires a great deal of work, and a sophisticated record keeping system; and, again, for this reason is probably not used by many companies.

#### Allocation of ULE Payments to Line of Business

Given that the most accurate methods of estimating ULE reserves are practically not feasible for most companies, how then are reasonable ULE reserves established? Well, the starting point for many of the methods commonly used by companies is an allocation of ULE payments by line of business - which, of course, is required for Annual Statement reporting purposes.

The allocation techniques used by companies vary from company to company and depend upon management's views on how ULE is incurred by claim, and the level of accuracy required given expense considerations.

Possible bases for allocating paid ULE by line of business include:

- # claims incurred during the year - assumes that ULE payments are made only on newly opened claims (or that any open claim that was closed during the year is replaced by a newly opened claim); and that the amount of ULE payments made on a newly opened claim is the same irrespective of type and size of claim.
- # claims opened during the year plus # claims closed during the year - assumes that ULE payments are made only when a claim is first opened, and when a claim is closed; and that the amount of ULE paid when a claim is opened is the same as the amount of ULE paid when a claim is closed; and that the amount of ULE paid on a newly opened or recently closed claim is the same irrespective of type of claim.
- # of days claims remained open during the year - assumes that ULE payments are made ratably over the life of a claim; and that the amount of ULE paid on a claim is the same irrespective of type of claim.
- amount of loss payments made during the year - assumes that ULE payments are made only in proportion to the loss payments that are made on a claim.

In all likelihood, because of the limitations of each of these approaches, companies probably use combinations of these or other methods. For example, adjustments could be made to recognize that everything else being equal it is more difficult to settle a liability claim than a property claim. It is also quite possible to vary the method used by category of ULE expense. Once again, the more accurate the allocation, the more accurate will be the ULE reserves.

Once a company has decided on the allocation of ULE payments by line of business, then other methods of estimating ULE reserves can be applied.

#### Fixed ULE Distribution By Accident Year

One of the less sophisticated of such methods of ULE reserve estimation is to make some assumption about the distribution of ULE calendar year payments by accident year, assume this distribution to remain stable, and then project unpaid ULE based on this accident year distribution.

For example, Schedule P currently instructs us to allocate calendar year ULE payments by accident year as follows:

- ° 45% to the most recent year
- ° 5% to the next most recent year
- ° the balance to all years based on the proportion

of each accident year's loss payments made during  
the most recent calendar year

Let's suppose that following this allocation procedure results in  
the following distribution of calendar year 1983 ULE payments by  
accident year:

<u>Accident Year</u>	<u>% ULE Paid</u>
1983	60%
1982	20
1981	10
1980	5
1979	3
1978	2

If we assume this pattern is stable, we can then say that the %  
unpaid ULE by accident year is as follows:

<u>Accident Year</u>	<u>% ULE Unpaid</u>
1983	40%
1982	20
1981	10
1980	5
1979	2
1978	0



So, the ULE reserve for accident year 1983 is 40% of an average year's ULE payments; for 1982 it is 20%; for 1981 it is 10%, etc. If we select an average calendar year's ULE payments to be \$35 million, then the ULE reserves would be as follows:

<u>Accident Year</u>	<u>ULE Reserves</u>
1983	40% x \$35 million = \$14.00 million
1982	20% x " " = 7.00 "
1981	10% x " " = 3.50 "
1980	5% x " " = 1.75 "
1979	2% x " " = 0.70 "
1978	0% x " " = <u>0.00</u>
 Total ULE Reserve	 \$26.95 million

Some limitations of this method are that it does not recognize the changing volume of writings (e.g. a sharp increase in the size of the book will cause the distribution of loss payments, and hence ULE payments, to change), changing patterns of loss payments (e.g. a speed up of claim settlement will cause the distribution of loss payments, and hence ULE payments to change), and inflation of loss expense costs (to the extent it is different than the inflation on loss costs). The method could be modified to overcome, at least to some extent, these problems by making year by year projections of both the amount of ULE to be paid, and the distribution of loss and ULE payments by accident year. But these projections are difficult to make unless other

assumptions are made. Generally this method would only be used for any line or coverage for which a degree of stability is expected.

#### Paid-to-Paid Method

Two assumptions about how ULE is incurred that are commonly made by companies and which also underly the Schedule P instructions for allocating ULE payments by accident year are that

- 50% of the ULE on a claim is paid when the claim is reported, and the remaining 50% is paid in direct proportion to loss payments as loss payments on the claim are made. If there are no partial payments, then the remaining 50% is paid when the claim is closed.
  
- the ratio of calendar year ULE payments to calendar year loss payments is stable.

These assumptions lead to the most common method of estimating ULE reserve:

- Distribute calendar year ULE payments by accident year according to the Schedule P instructions (previously stated). Note, this allocation of ULE payments assumes that 5% of the calendar year ULE payments are attributed to late reported claims from the prior accident year - the 5% allocation to the next most recent accident year. This

leaves us with 50% (45% + 5%) of ULE allocated to the year when the losses were first reported, and the remaining 50% allocated to when the loss payments are made.

- apply 50% of the assumed ratio of calendar year ULE payments to calendar year loss payments to the loss reserve for reported claims, and add to this 100% of the assumed ratio of calendar year ULE payments to calendar year loss payments applied to the loss reserve for IBNR claims.

The following exhibits illustrate this method.

ABC INSURANCE COMPANY

Auto Liability

Loss Payments

(\$000's)

Accident Year	Calendar Year					
	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>	<u>1982</u>	<u>1983</u>
1971						
1972						
1973	300	50	0			
1974	1,000	400	100	20		
1975	5,000	1,700	700	300	100	
1976	13,000	6,200	3,800	1,700	900	300
1977	39,000	17,700	9,700	5,400	2,900	1,100
1978	45,200	45,800	18,800	10,200	5,100	3,100
1979		54,900	53,100	25,900	12,600	6,700
1980			61,900	64,000	24,500	14,900
1981				74,800	71,000	33,100
1982					72,400	70,000
1983						<u>65,800</u>
	<u>\$103,500</u>	<u>\$126,750</u>	<u>\$148,100</u>	<u>\$182,320</u>	<u>\$189,500</u>	<u>\$195,000</u>

ABC INSURANCE COMPANY

Auto Liability

ULE Payments

(\$000's)

Accident <u>Year</u>	<u>Calendar Year</u>					
	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>	<u>1982</u>	<u>1983</u>
1971						
1972						
1973	30	5				
1974	75	80	1	1		
1975	300	100	60	20	10	
1976	950	500	300	100	70	30
1977	3,000	1,300	800	400	200	100
1978	10,000	4,400	1,500	700	400	270
1979		12,800	5,700	2,000	1,000	570
1980			16,300	6,000	2,000	1,300
1981				17,200	7,300	2,800
1982					20,000	7,300
1983						<u>20,600</u>
	<u>\$14,355</u>	<u>\$19,185</u>	<u>\$24,661</u>	<u>\$26,421</u>	<u>\$30,980</u>	<u>\$32,970</u>

ABC INSURANCE COMPANY

Auto Liability

Ratio of Paid ULE to Paid Loss

(\$000's)

<u>Calendar</u> <u>Year</u>	<u>Paid</u> <u>ULE</u>	<u>Paid</u> <u>Loss</u>	<u>Paid ULE</u> ÷ <u>Paid Loss</u>
1978	\$14,355	\$103,500	.139
1979	19,185	126,750	.151
1980	24,661	148,100	.167
1981	26,421	182,320	.145
1982	30,980	189,500	.163
1983	<u>32,970</u>	<u>195,000</u>	<u>.169</u>
<b>Average</b>			.156

ABC INSURANCE COMPANY

Auto Liability

Indicated ULE Reserve

(\$000's)

Accident <u>Year</u>	<u>Loss Reserves</u>		Selected Ratio of ULE to <u>Loss</u>	<u>Projected ULE Reserve</u>		
	<u>Reported Claims</u>	<u>IBNR Claims</u>		<u>Reported</u> <sup>1</sup>	<u>IBNR</u> <sup>2</sup>	<u>Total</u> <sup>3</sup>
1976	\$ 1,220	\$ 0	.156	\$ 95	0	95
1977	3,908	0	.156	305	0	305
1978	5,510	3	.156	430	0	430
1979	14,964	322	.156	1,167	50	1,217
1980	25,187	663	.156	1,965	103	2,068
1981	54,447	1,813	.156	4,247	283	4,530
1982	93,087	4,741	.156	7,261	740	8,001
1983	139,168	29,545	.156	10,855	4,609	<u>15,464</u>
						\$32,110

1. .156 x Loss Reserves x 50%

2. .156 x Loss Reserves

Assuming the 50%-50% assumption is accurate, this traditional paid to paid approach in setting ULE reserves should yield a reasonably accurate reserve under the condition of a stable book of business. If the book of business is not stable, this method may yield excessive or inadequate reserves. For example, in times of rapid growth and low inflation, this approach has been shown to overstate reserves - and use of a ratio of paid ULE to  $\frac{1}{2}$  (paid + incurred loss) would yield a more accurate reserve. Adjustments to better reflect inflation and size of book changes are discussed in papers by John Kittel and Richard Bill.

The 50%-50% assumption is itself questionable. Although papers that have explored this assumption indicate that the 50%-50% assumption is not unreasonable, one would think that this assumption does not hold for all types of claims, i.e. large vs. small, fast closing vs. long tail, liability vs. property, and single payment vs. multi payment. And depending upon how a company defines an IBNR claim, it may not be valid to assume that no ULE expense has been incurred on an IBNR claim. This would be the case if some of the IBNR claims have already been reported to the company and simply have not been recorded. Companies must therefore determine for themselves, perhaps through studies, the appropriateness of the 50%-50% assumption; and if deemed inappropriate, to come up with a more appropriate assumption. For example, the estimated ULE reserve determined after application of the selected ULE to loss ratio, to the loss reserves can be further adjusted by a factor that better reflects the portion of the ULE that is yet unpaid. And this factor can



vary by type of claim, and type of reserve.

Another weakness in the method is the selection of the paid to paid ratio. Historical paid to paid ratios are not necessarily stable, especially in companies experiencing significant growth or decline in volume of business, or a significant shift in distribution of business. In addition, cost control measures could have a significant effect on paid to paid ratios. So reasons for a company's paid to paid ratios behaving the way they have should be carefully studied in order to provide a basis for projecting future paid to paid ratios.

One simplification of this method that is often made is rather than apply 100% of the calendar year ULE payments to loss payments ratio, to the IBNR reserves, simply add 5% of the ULE payments expected in the next calendar year.

The 5% assumption is consistent with the Schedule P assumption that 5% of the ULE payments in a calendar year are attributed to late reported claims arising from the prior accident year. This approach would have yielded a much lower ULE reserve estimate in the example because the projected IBNR in the example represents more than 5% of the expected ULE payments for 1984.

ABC INSURANCE COMPANY

Auto Liability

Indicated ULE Reserve

(\$000's)

Accident Year	Loss Reserves on Requested Claims	Projected 1984 ULE Payments	Projected ULE Reserves		
			Reported <sup>1</sup>	IBNR <sup>2</sup>	Total <sup>3</sup>
1976	\$1,220	-	\$ 95	0	\$ 95
1977	3,908	-	305	0	305
1978	5,510	-	430	0	430
1979	14,964	-	1,167	0	1,167
1980	25,187	-	1,965	0	1,965
1981	54,447	-	4,247	0	4,247
1982	93,087	-	7,261	0	7,261
1983	139,168	-	10,855	<u>1,750</u>	<u>12,605</u>
		\$35,000			\$28,075

1. .156 x Loss Reserves x 50%

2. .05 x \$35,000

Paid-to-Paid Method - By Projected Runoff of Losses

A modification of the traditional paid to paid approach was presented by Phillip S. Moore at last year's Loss Reserve Seminar. Under this approach, ratios of ULE payments to loss payments are determined by development period for historical accident years. Ratios are selected by development period based upon historical patterns, and these ratios are applied to the projected future loss payments by development period by accident year.

The following exhibits will illustrate this approach.

ABC INSURANCE COMPANY  
Auto Liability  
Ratios of Paid ULE to Paid Loss

Accident Year	Development Period (Months)								
	<u>0-12</u>	<u>12-24</u>	<u>24-36</u>	<u>36-48</u>	<u>48-60</u>	<u>60-72</u>	<u>72-84</u>	<u>84-96</u>	<u>96-Ult</u>
1976			.073	.081	.079	.059	.078	.100	.100
1977		.077	.073	.082	.074	.069	.091		
1978	.221	.096	.080	.067	.078	.087			
1979	.233	.107	.077	.079	.085				
1980	.263	.094	.082	.087					
1981	.230	.103	.085						
1982	.276	.104							
1983	<u>.313</u>	_____	_____	_____	_____	_____	_____	_____	_____
Average	.256	.097	.078	.079	.079	.072	.085	.100	.100

**ABC INSURANCE COMPANY**  
**Auto Liability**  
**Expected Payout of Loss Reserves\***  
**(\$000's)**

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Accident Year	Development Period (Months)							
	<u>12-24</u>	<u>24-36</u>	<u>36-48</u>	<u>48-60</u>	<u>60-72</u>	<u>72-84</u>	<u>84-96</u>	<u>96-Ult</u>
1976								1,220
1977							604	3,304
1978						2,273	802	2,438
1979					6,062	3,873	1,347	4,004
1980				10,129	6,307	4,013	1,338	4,063
1981			24,234	12,705	7,764	4,941	1,647	4,969
1982		44,164	23,522	12,001	7,441	4,560	1,440	4,700
1983	84,632	37,745	20,396	10,315	6,330	3,985	1,407	3,903

\*determined through studies of historical loss runoff patterns

ABC INSURANCE COMPANY  
 Auto Liability  
 Expected Payout of ULE\*  
 (\$000's)

Accident Year	Development Period (Months)							
	<u>12-24</u>	<u>24-36</u>	<u>36-48</u>	<u>48-60</u>	<u>60-72</u>	<u>72-84</u>	<u>84-96</u>	<u>96-Ult</u>
1976								122
1977							60	330
1978						193	80	244
1979					436	329	135	400
1980				800	454	341	134	406
1981			1,915	1,004	559	420	165	497
1982		3,445	1,858	948	536	388	144	470
1983	8,209	2,944	1,611	815	456	339	141	390

\*calculated by applying paid to paid ratios by development period to projected loss payments by development period

Total ULE Reserves  
 (\$000's)

1976	\$122
1977	390
1978	517
1979	1,300
1980	2,135
1981	4,560
1982	7,789
1983	<u>14,905</u>
	\$31,718

In addition to the assumptions underlying these paid to paid methods which I have already commented on, there is one other common assumption shared by the methods: that the loss reserves are accurate. To the extent that the loss reserves are inadequate or excessive, assuming all of our other assumptions to be correct, the ULE reserves will be correspondingly inadequate or excessive.

#### ULE Development Factors

One approach to ULE reserving that does to rely on this assumption of accuracy of the loss reserves is the application of development factors to paid ULE by accident year to arrive at ultimate ULE by accident year. Payments to date are then subtracted from the ultimate incurred to arrive at the ULE reserve values by accident year. ULE payments by accident year are determined from the Annual Statement.

The following exhibits illustrate the working of this method.

**ABC INSURANCE COMPANY**  
**Auto Liability**  
**ULE Payments**  
**Cumulative**  
**(\$000's)**

<u>Accident Year</u>	<u>Calendar Year</u>					
	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>	<u>1982</u>	<u>1983</u>
1976	8,800	9,300	9,600	9,700	9,770	9,800
1977	12,600	13,900	14,700	15,100	15,300	15,400
1978	10,000	14,400	15,900	16,600	17,000	17,270
1979		12,800	18,500	20,500	21,500	22,070
1980			16,300	22,300	24,300	25,600
1981				17,200	24,500	27,300
1982					20,000	27,300
1983						20,600



ABC INSURANCE COMPANY  
Auto Liability  
Paid ULE Development Factors

<u>Accident Year</u>	<u>12-24</u>	<u>24-36</u>	<u>36-48</u>	<u>48-60</u>	<u>60-72</u>	<u>72-84</u>	<u>84-96</u>	<u>94-Ult</u>
1976			1.057	1.032	1.010	1.008	1.003	1.010
1977		1.103	1.058	1.027	1.013	1.007		
1978	1.440	1.104	1.044	1.024	1.016			
1979	1.445	1.108	1.049	1.027				
1980	1.368	1.090	1.053					
1981	1.424	1.114						
1982	1.365							
<u>1983</u>	<u>-</u>	<u>-----</u>	<u>-----</u>	<u>-----</u>	<u>-----</u>	<u>-----</u>	<u>-----</u>	<u>-----</u>
Average	1.408	1.104	1.052	1.028	1.013	1.008	1.003	1.010
Cumulative	1.737	1.234	1.118	1.063	1.034	1.021	1.013	1.010

ABC INSURANCE COMPANY  
Auto Liability  
Indicated ULE Reserve

<u>Accident Year</u>	<u>Paid ULE A/O 12/83 (\$000's)</u>	<u>Selected Development Factors</u>	<u>Projected ULE Incurred \$000's</u>	<u>Indicated Reserve \$000's</u>
1976	\$ 9,800	1.010	\$ 9,898	\$ 98
1977	15,400	1.013	15,600	200
1978	17,270	1.021	17,633	363
1979	22,070	1.034	22,820	750
1980	25,600	1.063	27,213	1,613
1981	27,300	1.118	30,521	3,221
1982	27,300	1.234	33,688	6,388
1983	20,600	1.737	35,782	<u>15,182</u>
				\$27,815

The advantage of this method is that it is based entirely on Schedules O & P data from the Annual Statement, and is not dependent upon the adequacy of the loss reserves, nor is an assumed relationship between ULE payments and loss payments required.

But while assumptions about the future relationship between paid ULE and paid loss need not be made, development factors must be selected. Not only is it likely that historical paid ULE development may not have exhibited any patterns or trends that could be assumed to extend into the future, but because of "environmental" changes such as changes in the Claim Department operating efficiency, or shifts in distributions of business, for example by state, future development patterns may be quite different from historical patterns. Therefore, the same degree of care must be exercised in projecting future ULE development as is necessary in projecting future paid to paid ratios.

## Conclusion

Due to the nature of ULE, companies are faced with the problem of establishing reserves for ULE without knowing how ULE is incurred on a claim by claim basis. To overcome this problem, assumptions about how ULE is incurred by claim must be made. The more accurate the allocation, the more accurate will be the reserves.

But accuracy in allocation is costly. Typically companies will, therefore, allocate ULE to line of business through some means, and then follow the Schedules O & P instructions to allocate ULE to accident year. From this point one of several basic techniques are used to project ULE reserves. The most common of these methods assumes a direct relationship between loss payments and ULE payments.

These basic methods are felt to produce reasonable reserve levels if applied properly. However, even so, the assumptions underlying the methods are not valid in all situations; therefore, extreme care should be exercised in utilizing any of the basic methods to project ULE reserves. A bibliography of papers on ULE reserving is provided for those who wish to explore this subject further.

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