

DISCUSSION BY J. R. BERQUIST

One can hardly read Mr. Balcarek's paper without becoming concerned about the adequacy of the industry's automobile bodily injury reserves in New York, and although there may be reason to expect more upward development of these reserves in New York state than elsewhere, the concern inevitably extends to other states, and eventually to other bodily injury reserves as well.

In view of these implications, it is important that we consider the extent to which the author's results and conclusions may have been influenced by his methodology. The tables which follow will show that, although the paper may exaggerate the magnitude of the trends described therein, the direction is valid and should be a matter of concern for company management and owners alike.

In Table 1 of the paper, the author used a least-squares trend line to project ratios of cumulative paid losses at X months development to paid losses at (X-12) months development. In general, this technique is both sound and practical. However, whenever a trend line is used to extrapolate into the future, as must be done with so many actuarial computations, it must be recognized that even a line developed with sophisticated mathematics is entirely dependent upon the points which have been used to develop that line. Since the selection of the points to be included in the calculation is usually a matter of judgment and convenience, one is at liberty to impose his own judgment upon that selection. In this review, we have purposely slanted those judgment selections toward optimistic results in an effort to answer the question: "At best, how bad can it be?" We have not attempted to answer the other obvious question, or to perform a sophisticated sensitivity analysis.

A careful review of the values in Table 1 of the paper, or preferably a plot of those points, reveals that the trend line could have been over-influenced by unusually large increases in the last few years. Suppose, for example, that we decided to use the same period of time but to eliminate the highest and the lowest value on grounds that each represents spurious deviations. In effect, we are assuming that the values for those two eliminated periods fall on the trend line. The results of a trend line developed in this manner are shown in Table A and Exhibit A.

TABLE A

AUTO B.I.—N.Y.

Ratio of cumulative paid losses at X months
development to paid losses at (X-12) months development

<i>Pol.</i> <u>Yr.</u>	<u>X=36</u>	<u>X=48</u>	<u>X=60</u>	<u>X=72</u>	<u>X=84</u>	<i>Ratio of Incurred Losses at 84 months to Paid Losses at 84 months</i>
						<u>months</u>
1965	1.6739	1.2890	1.1676	1.1239	1.0627*	1.0810*
1966	1.6896	1.2895	1.1956	1.1205*	1.0669*	1.0843*
1967	1.6843	1.3244	1.1800*	1.1283*	1.0711*	1.0877*
1968	1.7310	1.3131*	1.1884*	1.1362*	1.0753*	1.0910*
1969	1.7051*	1.3232*	1.1968*	1.1440*	1.0795*	1.0944*

*Projected by the use of straight lines fitted to the actual figures for the latest 11 years but eliminating the highest and the lowest values

In order to get still another "feel" for the range of compound effects of the extrapolated values, a "trend line" was drawn by inspection of past values. The line was selected so that it is the lowest trend line that could reasonably emerge. The results of this effort are shown in Table B and Exhibit B.

TABLE B

AUTO B.I.—N.Y.

Ratio of cumulative paid losses at X months
development to paid losses at (X-12) months development

<i>Pol.</i> <u>Yr.</u>	<u>X=36</u>	<u>X=48</u>	<u>X=60</u>	<u>X=72</u>	<u>X=84</u>	<i>Ratio of Incurred Losses at 84 months to Paid Losses at 84 months</i>
						<u>months</u>
1965	1.674	1.289	1.168	1.124	1.058*	1.068*
1966	1.690	1.290	1.196	1.118*	1.059*	1.069*
1967	1.684	1.324	1.172*	1.121*	1.060*	1.071*
1968	1.731	1.320**	1.178*	1.124*	1.061*	1.072*
1969	1.713**	1.331**	1.182*	1.128*	1.062*	1.073*

**Most Favorable" line

***Most Favorable" values equivalent to author's

A comparison of the indicated inadequacy levels at the end of the first year of each of the policy years 1965 through 1969, calculated by each of the three methods is as follows:

TABLE C
COMPARISON OF RESULTS
Loss Development After the End of First Year
As a % of Outstanding Reserves

<i>Policy Year</i>	<i>11 Point Trend Line, per paper (Exhibit I)</i>	<i>11 Period but Eliminating Highest and Lowest Points (Exhibit A)</i>	<i>Most Favorable Trade Line (Exhibit B)</i>
1965	(-)12.3	(-)10.9	(-) 8.3
1966	(-)17.6	(-)15.0	(-)12.9
1967	(-)18.2	(-)14.4	(-) 8.2
1968	(-)21.6	(-)16.3	(-) 9.2
1969	(-)22.4	(-)15.8	(-) 7.6

The above comparison shows most of the range within which the actual results are likely to fall. Even acknowledging that the "most favorable" line itself does not have a sound statistical basis, it does, nevertheless, provide an estimate of the lower end of the range of inadequacy. While no effort has been made to develop the upper end of the range by the selection of a most unfavorable line, it is this reviewer's opinion that the author's results are closer to that end of the scale.

The values developed in the above tables and exhibits can be converted to reserve margin indications as the author has shown in Table 3 of the paper. A comparison of these indications is as follows:

TABLE D
COMPARISON OF RESERVE MARGINS

<i>Policy Years</i>	<i>Valuation Date</i>	<i>Reserve Margin*</i>					
		<i>Table 3</i>		<i>Exhibit A</i>		<i>Exhibit B</i>	
		<i>Amount</i>	<i>%</i>	<i>Amount</i>	<i>%</i>	<i>Amount</i>	<i>%</i>
1961-65	12-31-66	(-)6,195	(-)1.1	(-)3,321	(-)0.6	2,366	0.4
1962-66	12-31-67	(-)50,373	(-)8.6	(-)38,994	(-)6.6	(-)31,267	(-)5.3
1963-67	12-31-68	(-)69,530	(-)11.0	(-)52,104	(-)8.2	(-)13,616	(-)2.1
1964-68	12-31-69	(-)105,403	(-)15.7	(-)74,294	(-)11.1	(-)26,789	(-)4.0
1965-69	12-31-70	(-)132,664	(-)18.8	(-)83,956	(-)11.9	(-)18,451	(-)2.6

*(-) indicates loss reserve inadequacy. Amounts in thousands of dollars while percentages are of outstanding reserves.

CONCLUSIONS

Although it appears to this reviewer that the magnitude of the inadequacy is on the high side, it is important to note that the fundamental premise of the paper ("it is obvious that during the sixties less adequate loss reserves acquired a fair amount of popularity, if not respectability") remains unchallenged. Even if the emerging results tend toward the "most favorable" line, they are still unacceptable!

Company management, regulators, and owners certainly must remedy this condition if the companies are to survive over the long pull. One way to do this would be to give more attention to the use of available actuarial and statistical techniques to evaluate the overall levels of their reserves.

It is easy to allow other day-to-day concerns to overshadow this most important task of maintaining adequate reserves. Mr. Balcarek's continuing vigilance, however, has helped to remind us all of our responsibility.

EXHIBIT A

New York Auto B.I.
Development of Loss Experience by Policy Year

<i>Experience as of the End of Calendar Year</i>	<i>% TO EARNED PREMIUM</i>			<i>Loss Development after the end of Calendar Yr.**</i>	
	<i>Paid Loss</i>	<i>O/S Loss</i>	<i>Incurred Loss</i>	<i>Amount</i>	<i>% of O/S</i>
<u>Pol. Yr. 1965</u>					
1966	19.366	39.326	58.692	(-)4.297*	(-)10.93
1967	32.416	28.967	61.383	(-)1.106*	(-) 3.82
1968	41.784	21.261	63.045	.056*	.26
1969	48.788	14.217	63.005	.016*	.11
1970	54.831	7.931	62.762	(-) .227*	(-) 2.86
1971	58.269*	4.720*	62.989*		
<u>Pol. Yr. 1966</u>					
1967	18.981	39.187	58.168	(-)5.918*	(-)15.01
1968	32.069	28.702	60.771	(-)3.315*	(-)11.55
1969	41.352	20.796	62.148	(-)1.938*	(-) 9.32
1970	49.440	12.684	62.124	(-)1.962*	(-)15.47
1971	55.398*				
1972	59.104*	4.982*	64.086*		
<u>Pol. Yr. 1967</u>					
1968	18.927	40.691	59.618	(-)5.872*	(-)14.43
1969	31.879	29.863	61.742	(-)3.748*	(-)12.55
1970	42.221	21.423	63.644	(-)1.846*	(-) 8.62
1971	49.821*				
1972	56.213*				
1973	60.210*	5.280*	65.490*		
<u>Pol. Yr. 1968</u>					
1969	18.447	41.251	59.698	(-)6.719*	(-)16.29
1970	31.931	31.526	63.457	(-)2.960*	(-) 9.39
1971	41.929*				
1972	49.828*				
1973	56.615*				
1974	60.878*	5.539*	66.417*		
<u>Pol. Yr. 1969</u>					
1970	17.537	40.132	57.669	(-)6.331*	(-)15.76
1971	29.902*				
1972	39.567*				
1973	47.354*				
1974	54.172*				
1975	58.479*	5.521*	64.000*		

*Estimated

**(-) indicates adverse development

EXHIBIT B

New York Auto B.I.
Development of Loss Experience by Policy Year

<i>Experience as of the End of Calendar Year</i>	<i>% TO EARNED PREMIUM</i>			<i>Loss Development after the end of Calendar Yr.**</i>	
	<i>Paid Loss</i>	<i>O/S Loss</i>	<i>Incurred Loss</i>	<i>Amount</i>	<i>% of O/S</i>
Pol. Yr. 1965					
1966	19.366	39.326	58.692	(-)3.264	(-) 8.30
1967	32.416	28.967	61.383	(-) .573	(-) 1.98
1968	41.784	21.261	63.045	1.089	5.12
1969	48.788	14.217	63.005	1.049	7.38
1970	54.831	7.931	62.762	.806	10.16
1971	58.011*	3.945*	61.956*		
Pol. Yr. 1966					
1967	18.981	34.187	58.168	(-)4.406	(-)12.89
1968	32.069	28.702	60.771	(-)1.803	(-) 6.28
1969	41.352	20.796	62.148	(-) .426	(-) 2.05
1970	49.440	12.684	62.124	(-) .450	(-) 3.55
1971	55.274*				
1972	58.535*	4.039*	62.574*		
Pol. Yr. 1967					
1968	18.927	40.691	59.618	(-)3.355	(-) 8.24
1969	31.879	29.863	61.742	(-)1.231	(-) 4.12
1970	42.221	21.423	63.644	.671	.03
1971	49.483*				
1972	55.470*				
1973	58.799*	4.174*	62.973*		
Pol. Yr. 1968					
1969	18.447	41.251	59.698	(-)3.778	(-) 9.16
1970	31.931	31.526	63.457	(-) .019	(-) .00
1971	42.149*				
1972	49.651*				
1973	55.808*				
1974	59.213*	4.263*	63.476*		
Pol. Yr. 1969					
1970	17.537	40.132	57.669	(-)3.035	(-) 7.56
1971	30.041*				
1972	39.954*				
1973	47.226*				
1974	53.271*				
1975	56.574*	4.130*	60.704*		

*Estimated **(-) indicates adverse development