NO-SPLIT EXPERIENCE RATING PLANS

JOHN P. WELCH

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DISCUSSION BY LESTER B. DROPKIN

Although it is clear that Mr. Welch's primary concern is with the experience rating plans in use in the third-party lines, he has chosen to use as one main vehicle for his discussion the no-split workmen's compensation experience rating plan of Pennsylvania. This then allows him to compare and contrast the workmen's compensation experience rating plan with the other plans. Having introduced the Pennsylvania workmen's compensation plan, however, he is also led to give some consideration to the more commonly used multi-split workmen's compensation experience rating plans. Accordingly, at one point or another, either explicitly or implicitly, the paper touches on virtually every aspect of experience rating.

It appears to this reviewer that the net result of all of this is that the paper is marked by a certain unevenness of treatment. It is almost as though Mr. Welch could not quite bring the contemplated reader of his paper into focus. Intermingled throughout, we are given some history, some theory, some data, some analysis, some practical considerations and some conclusions.

Yet, there is something else which we are given also; *viz.*, a very properly taken point of view which challenges us to define objectives, and to explicate the criteria by which success in meeting those objectives may be measured.

Let us now look at the author's loss ratio variance test. It is well to remember at the outset, however, that anyone who attempts to analyze the specific results being produced by a given workmen's compensation experience rating plan will be faced with a general problem, whatever his particular approach might be. Because all workmen's compensation experience rating plans contain a provision for combination of entities, the experience modifications are computed on the basis of the risk's combined experience. On the other hand, loss ratios are normally available on a unit report basis only. That is, if the modification applicable to a particular policy also applies to other policies of the risk, ideally one should combine the several policies to form just one risk loss ratio. Although we recognize

the practical difficulties involved, if this is not done some distortion will result.

Another possible source of distortion, although probably minor, given broad premium size groupings, arises if the assignment to premium size group is done on the basis of standard premium rather than manual premium. The author does not state the basis for his assignment, but we suspect that it may have been on the basis of standard premium.

While we do not know how great an effect the foregoing might have had on the results shown in Exhibit III-A, and Exhibits A and B of the Appendix, we are nevertheless willing to assume for the purpose of further discussion that the results would have been substantially the same. We do, however, seriously question whether simply comparing the standard deviations of the loss ratio distributions before and after the application of the experience modifications is quite correct,. We would suggest, rather, that a more proper statistic for comparing the loss ratio distributions is the coefficient of variation.

If we compute the coefficients of variation from the data set forth in Exhibits A and B of the Appendix, the following interesting result appears:

Policy Size Group	Coefficient of Variation*		
	(1) Manual	(2) Standard	(3) Ratio (2) ÷ (1)
1	4.42	4.28	.968
2	3.68	3.67	.997
3	3.03	3.01	.993
4	2.29	2.23	.974
5	1.70	1.66	.976
6	.95	.91	.958
7	.69	.66	.957
8	.78	.44	.564
All	1.61	1.43	.888

*Weighted Standard Deviation ÷ Loss Ratio

It is immediately seen that there is a reduction for each of the size groups, as well as in total. Moreover, there is a greater proportional reduction as size increases. Indeed, for the largest policies (size Group 8), the reduction is quite large.

Regardless of whether the experience rating data are analyzed by means of standard deviations or coefficients of variation, it is most important to stress the necessity of taking into account the sampling distribution of individual risk loss ratios over time, particularly with respect to the smaller size risks. While Mr. Welch, of course, is aware of this, and although he refers to it in the final sentences of the section wherein his test is presented, we would suggest that until a detailed analysis is made of the question, and the impact measured, it is really premature to attempt to draw conclusions.

Related to this is the question of whether or not it is correct to set the adjustment of "each risk's loss ratio to the average" as an objective of experience rating. Actually, the question cannot be answered unless it is posed in a much sharper form. Is Mr. Welch suggesting that the objective is a standard premium loss ratio at the average for each risk, each year? We hardly think so. Consider, for example, the smaller risks which typically have no losses for several years running. Such a risk normally has had no losses during the experience period, produced a credit modification, and a zero loss ratio for the year during which the modification applies.

There are apparently two alternatives open to us. If we wish to concentrate on each risk, then the objective has to be set in some such terms as: estimating the expected losses of the risk; "expected losses" being used here in its statistical sense, and, as such, implying an average over time. Alternatively, if we wish to concentrate on a particular year, we would have to set the objective in terms of average results for a group of risks, with the criteria being based on something other than a comparison of the manual and standard loss ratio distributions. Perhaps the only risks for which it might be meaningful to consider an "each risk, each year" approach are the very large ones, where the variance of the sampling distribution over time is presumably minimal. But even in this case one would surely want to investigate actual distributions first.

Before closing this review, I would like to briefly mention another approach to testing how well a given experience rating plan is operating. This consists of making a comparison of the manual premium loss ratios

for a given period with the modifications which applied during that period. As the modifications increase, the loss ratios should show a concomitant increase. As an example of this kind of comparison, there is set forth below California experience for policy year 1968, 3rd reports.

Modification Interval	No. of Reports	Average Modification	Manual Premium Loss Ratio
Below .75	666	.608	.3653
.76— .85	6398	.813	.4140
.86— .90	11380	.881	.4719
.91— .95	10667	.929	.5040
.96— .99	5027	.975	.5219
Sub-Total (Credits)	34138	.824	.4453
1.00—1.04	6591	1.018	.6034
1.05—1.14	7710	1.091	.6654
1.15—1.34	5923	1.216	.7620
1.35 and over	1895	1.508	.9453
Sub-Total (Debits)	22119	1.145	.7020

Experience rating is, or should be, a subject of considerable interest to all members of the Society. It is a complex and many-faceted subject. Its many interrelating aspects must be studied from both a theoretical and practical point of view. We therefore welcome the stimulus to further thought provided by Mr. Welch.