© The Journal of Risk and Insurance, 1995 Vol. 62, No. 3, 585-589

Pitfalls of the Current Experience Rating Plan: Comment

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Introduction

Experience rating is a powerful—but fragile—tool for pricing workers' compensation insurance policies. It is not well understood but frequently criticized. Criticism from those with no understanding and obvious prejudice are easy to rebuff. Criticism from those with some knowledge of experience rating and an unbiased point of view are more of a challenge, especially if they are well thought out. Parry and Math's (1993) article in this journal, "Pitfalls of the Current Experience Rating Plan," is reasonably well thought out but not up to date. Some of the problems it describes did exist in the past but most have been solved by ongoing improvements to the plan described briefly below.

A large amount of material describing revisions to experience rating became available in the late 1980s. Venter (1987) describes actuarial/statistical tests used to measure the predictive accuracy of experience rating. In mid-1989, the National Council on Compensation Insurance (NCCI) (1989b) filed the Revised Experience Rating Plan in most states. The filing describes not only the rule changes, but the extensive statistical testing done to support the filing. Later in 1989, several NCCI publications (1989a, 1989c, 1989d) describing changes to the plan were distributed by NCCI's staff. King and Gillam's (1990) article in the *NCCI Digest* describes the underwriting value of the new plan to a fairly broad audience. Gillam (1990) describes the application of Venter's tests employed to parametrize the plan. Mahler (1991) compares application of credibility in the new vs. old plans. Gillam (1992a) published an award-winning version of his 1990 article in the Proceedings of the Casualty Actuarial Society in May 1992.

Up-To-Date Description of the Experience Rating Formula

The experience rating plan was extensively revised in the late 1980s. NCCI filed changes to the plan in 1989, with approved effective dates by state vary-

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ing over the next three years. The revised plan uses the same basic formula as the old (which Parry and Math describe).

$$\text{Modification} = M = \frac{A_p + WA_x + (1-W)E_x + B}{E+B},$$

where A = actual loss (during the experience period),
E = expected losses (during the experience period),
p = primary (the first \$5,000 of each loss),
x = excess (the loss between the primary layer and the accident limit, which varies by state),
B = credibility ballast, and
W = weighting value.

The revised experience rating plan changed significantly the values of parameters W and B. For the smallest insureds, the credibility ballast B takes its smallest value, 7,500. As the size of the insured (measured by its expected losses E) increases, so does B. For the largest insureds, B is approximately 0.10 E. The weighting value W varies between 0.07 for the smallest risks and 0.63 for the largest; it is never zero or one. The net effect of these changes is far greater responsiveness of the plan to the experience of smaller employers, which comprise the majority of insureds. The responsiveness of the revised plan is less than that of the old plan on only the very largest insureds. These characteristics are described in detail by Mahler (1991), which Parry and Math also cite. The changes resulted from extensive statistical testing, utilizing basic actuarial principles as called for by Parry and Math.

The above changes were implemented while retaining most of the administrative features of the old plan, including, as noted, the formula. The tremendous cost of dismantling the old plan and creating a new one was avoided. Before addressing specific problems, it is appropriate to begin with a discussion of what is fair to expect of experience rating.

What We Can Expect of Experience Rating

Experience rating as currently administered by the NCCI is a highly-regulated, well-defined plan. It adds a high degree of individual risk equity to the unmodified application of classification rates (or loss costs) from the Workers Compensation Basic Manual. Any discussion that highlights possible inequities in the plan should also recognize its irreproachable contribution to fair pricing.

We agree with the hypothesis that there are pitfalls to experience rating. There will always be challenges to the plan, and it is a major undertaking to meet those challenges. It is unrealistic to expect experience rating to unerringly produce equity in every case. No formula can properly reflect every possible characteristic of the individual risk; most cannot be quantified.

What can be expected is that experience rating will significantly improve manual classification rating, which it does. The old and revised plans both do this. We know this because of the testing described in Dorweiler (1934), Venter (1987), and Gillam (1990, 1992a, 1992b, 1992c). These and other articles show that employers who have debit modifications indeed tend to produce worse loss experience in the projected period than that expected based on manual rates. Testing shows that, for the revised plan, the correction provided by the modification tends to equalize loss ratios; that is, debit modifications decrease loss ratios toward the average, and credit modifications increase loss ratios toward the average.

Experience rating is but one tool in a pricing process that begins with statistically-supported manual rates, is followed by the experience modification, and ends long after. The first two steps are based on objective statistics collected under well-documented and highly-regulated rules. This is not enough to determine fair price. Changes in insurers' hazard due to unusual growth or changes in ownership, physical plant, management, or operations logically fall into the province of underwriting, an essential part of the process which is subsequent to experience rating. Most states encourage this kind of price competition by allowing deviations, underwriting selection, dividend plans, schedule rating, and loss-sensitive rating plans such as retrospective rating. All but the first come *after* experience rating in the pricing process.

Evaluation of Parry and Math's Points

Parry and Math seem to confuse class ratemaking and experience rating. They assert that "The use of multiple credibility factors (for the class and individual risks) creates a difficulty and with credibility applying to several individual risks in the same class, the rationale for credibility itself becomes suspect." Perhaps we actuaries should make our lives less difficult and stop using credibility, or at least stop rationalizing it. In any case, the use of credibility in class ratemaking can hardly be thought of as a deterrent to its use in experience rating.

It is *not* an actuarial principle that experience rating collectively will have a negative off-balance. It *does* happen to be the case in many states that larger insureds have better experience than smaller ones; because of their greater credibility, experience modifications tend to generate average credits. This was observed by Dorweiler (1934). In some states, however, the reverse is the case, and the average experience modification is a debit.

It was probably due to soft market conditions that rules for retention of experience in the case of acquisitions or changes in ownership came to be in the form correctly criticized by Parry and Math. Before the adverse underwriting experience of the 1980s, most of which also occurred before development of the more responsive experience rating plan, the experience modifications resulted in less responsive adjustments of the manual rates. Rates were adequate, or nearly so, and underwriters had room to adapt to special circumstances. The new plan was introduced at time when rates were often inadequate and business was more volatile. A lot more attention was drawn to the modification. The new plan's modifications tended to be higher than ever for risks with poor experience and lower than ever for claim-free risks. Many risks discovered they could avoid high modifications by nominal changes of ownership. At the same time, entities with low modifications based on good experience found difficulty passing that experience on to a new owner.

An NCCI filing in early 1990 largely mooted the key change in ownership pitfalls described by Parry and Math. Rules on experience to use in cases of acquisition and/or changes in ownership were significantly revised by a plan filing effective July 1, 1990 (NCCI, 1990). That filing made it much more difficult to lose (or avoid) use of historic data in the modification by a nominal change in ownership. Data of an acquired entity would be incorporated into the modification of the combined firm. In Parry and Math's examples, when the transportation company acquires the manufacturing company, the experience of both would be combined to develop a new modification. The same result would be obtained if the manufacturing company acquires the transportation company. Therefore, neither entity would receive any undue penalty or benefit for the transaction. The past experience of an entity would be excluded from the experience calculation only if a material change in ownership was accompanied by a change in operations sufficient to result in change of the governing classification and a change in the process and hazard of the operations.

The principle underlying the new change in ownership rules is that the modification should follow the financial responsibility. The 1990 filing recognized that financial responsibility does not change with a nominal change in ownership, such as from parent to child. A lot of thought went into the filing, which may not guarantee it will always produce the correct result, but should make clear the great difficulty of reducing the impact of changes in conditions to a formula.

The now current formula also responds to Parry and Math's criticisms with regard to changes in size. The credibility is based on the size of the exposure during the experience period; if the risk was smaller in the past, credibility will be smaller, and the modification will be closer to unity. These credibilities were measured using a large volume of actual experience rating data over a period of time in which there was normal inflationary growth, as well as the variety of patterns among the individual risks.

In the final section of their article, Parry and Math decry "rigid application of the experience rating procedure" yet propose changes that would attempt to reduce a large variety of possible changes in conditions to a formula. This would be rigid at best. It is better to leave the solution to the market, where underwriters can investigate to ascertain whether such changes are genuine and measure their impact.

It is NCCI policy to monitor and continually improve the experience rating plan. As noted above, several recent changes address problems highlighted by Parry and Math. Future changes will be incorporated into the plan on an evolutionary rather than revolutionary basis. In this way, we hope to build on understanding while retaining the known value of the plan.

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