is used, equation (6) is appropriate in dealing with rate revision adjustment factors (under the assumption of a level premium volume). However, when either Mr. Pruitt's or Mr. Otteson's formula is used, the more complex equation (14) would be the starting point for installment business.

Equation (37), which sets forth a formula for comparing rate levels between two different organizations, can also be used to good advantage to determine the value of "d" itself, which is used extensively throughout the earlier equations in the paper. In the denominator of equation (37) there is a ratio of the Bureau rate divided by the company rate. If this ratio is replaced by the old rate divided by the new rate, we then have a formula for determining the average rate level change. Notice that the weights used in this equation are based upon premium volume and not upon exposure units. (Remember that if exposure units are available, one would simply extend the exposures at old rates and then extend them at new rates and make the comparison in this fashion, thus avoiding the computational complexity of equation (37)).

# THE CANADIAN MERIT RATING PLAN FOR INDIVIDUAL AUTOMOBILE RISKS

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## VOLUME XLV, PAGE 214

### DISCUSSION BY A. D. PINNEY

Automobile insurance rates have been a matter of great concern to both the Insurance Industry and the insuring public during the past few years. Many solutions have been proposed, but the one put forth most often is Merit Rating. Mr. Wittick's paper on "The Canadian Merit Rating Plan For Individual Automobile Risks" is, therefore, very timely and of keen interest to most of us.

He has presented to the Society a clear and concise description of what the present Canadian plan is and how it evolved over a number of years. In addition, Mr. Wittick has exhibited data which clearly substantiates the theory that risks which have produced claims are more likely to have losses in the following year than those which are claim free.

In his conclusions, Mr. Wittick makes the following statement in reference to the advantages of this merit rating plan:

> "It permits a low rate for the select risk, and that is what the insuring public demands."

What this plan actually provides is a discount, not a low rate. It will be recalled that the base rate is applied in full for a risk having an accident during the past year, and discounts of 10%, 20%, and 35%, if accident free for one, two or three years. The off-balance that re-

sults from the current distribution of risks is so great as to require a base rate for liability over 40% higher than what would be required if no merit rating plan were used. The net result is that the 35% discount is in reality only an 8% discount, and the 20% and 10% discounts are actually surcharges of 13% and 28%. It can further be shown that for a driver to obtain a long term advantage under the Canadian Merit Rating Plan as it now exists, he should not average more than one loss every 13 years. Obviously, there are no large financial savings, and the insured who is getting a 10% or 20% discount is actually a poorer risk than average, not a preferred risk.

## DISTRIBUTION OF CARS INSURED

| Merit Rating | Class 1 | Class 2 | Class 3 | Class 4 | Class 5 | All Classes Combined |
|---|---|---|---|---|---|---|
| A | 82.7% | 75.7% | 76.1% | 62.3% | 79.6% | 80.5% |
| X | 3.7 | 4.1 | 4.8 | 6.6 | 4.4 | 4.0 |
| Y | 4.9 | 5.9 | 6.5 | 8.7 | 5.6 | 5.3 |
| B | 8.7 | 14.3 | 12.6 | 22.7 | 10.4 | 10.2 |
| Combined | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

## OFF-BALANCE PRODUCED BY DISCOUNTS ON THIS DISTRIBUTION

| Merit Rating | Distribution of Cars Insured | Percent of Base Rate | Cols. $(2)x(3)$ |
|---|---|---|---|
| A | 80.5% | 65 | .523 |
| X | 4.0 | 80 | .032 |
| Y | 5.3 | 90 | .048 |
| B | 10.2 | 100 | .102 |
| | | | .705 |

% Increase in Rate Level to Correct for Off-Balance:

$$\frac{100}{70.5} - 100 = 41.8$$

Effective Rate Level:

| Merit Rating | Adjusted Base Rate Level | Percent of Base Rate | Effective Rate Level $(2)x(3)$ |
|---|---|---|---|
| A | 141.8 | 65 | 92.2 |
| X | 141.8 | 80 | 113.4 |
| Y | 141.8 | 90 | 127.6 |
| B | 141.8 | 100 | 141.8 |

Comparative Costs of Insurance to a risk with a claim incurred during the 9th year. (Assuming a constant rate of $50 per year when no merit rating is involved.)

| Year | Cumulative Cost Merit Rating | Cumulative Cost No Merit Rating |
|------|------------------------------|----------------------------------|
| 9 | $414.90 | $450.00 |
| 10 | 485.80 | 500.00 |
| 11 | 549.60 | 550.00 |
| 12 | 606.30 | 600.00 |
| 13 | 652.40 | 650.00 |
| 14 | 698.50 | 700.00 |
| 15 | 744.60 | 750.00 |

Now this hasn't been shown in an attempt to discredit the plan where it is now used, but to show why it is extremely doubtful that it could be initiated in the United States in its present form. The required change in manual rates would be prohibitive.

It is significant, however, that by means of the Canadian Plan, the Automobile Insurance Industry is able, for the first time, to meet the demand for a rating plan that will produce a lower rate for the careful driver than that produced for the careless driver. It is hoped that the plans that have been or are about to be introduced in the United States will be as successful.