ABSTRACT OF THE DISCUSSION OF PAPERS READ AT THE PREVIOUS MEETING

A Procedure for Making Rates for Workmens' Compensation Insurance Based on a Consistent Application of the Theory of Probabilities

A. H. MOWBRAY

VOLUME IX, PAGE 186

WRITTEN DISCUSSION

MR. WILLIAM J. CONSTABLE:

I have been asked to discuss Mr. Mowbray's paper from a mechanical rather than an actuarial standpoint. Whenever changes are proposed in a ratemaking system the mechanics of operating the proposed methods must be considered as well as the theory underlying the method. If the procedure is complicated and cumbersome, the benefits gained by the changes proposed can be much more than offset. This, however, is not true of the changes in the method of ratemaking proposed in Mr. Mowbray's paper.

The proposed method of making Workmen's Compensation Rates has been used as the basis of the present revision of these rates by the National Council on Compensation Insurance with some changes. The method of determining conversion factors and of converting the material has been used almost without change. However, this conversion was made directly to the Basic Level instead of to the state latest level and then to the Basic Level. It was felt that the results did not warrant this extra work. A projection factor was also introduced into the procedure in order to bring the resulting rates to the proper level for conditions as they are expected to be in 1924. As has always been the case in the past, the work of preparing the material for presentation to the proper committees had to be done in the quickest time possible. Mr. Mowbray's proposal contemplated the conversion of material by the use of seven factors, one for payrolls and six for losses—one each for fatal, permanent total, major permanent partial, minor permanent partial, temporary total and medical. The work necessary to accomplish this procedure seemed enormous in view of the short amount of time available and the staff of the Council attempted to find a short cut to reduce the work.

A test was made by using one factor for payrolls and three factors for losses instead of six. The results of this test seemed to indicate that this method would produce nearly as accurate results as the longer method. However, certain objections were raised relative to this shorter method which could not be answered absolutely without exhaustive tests which would have taken as much time as to begin immediately upon the work by the original process.

Knowing that the time was limited, the Council obtained all the assistance possible and began work at once on the conversion of the data by the use of seven factors. The experience used in the 1923 Revision consisted of the Schedule "Z" reports for thirty states for policy years 1918, 1919 and 1920. A comparison of the amount of experience used in the 1923 Revision with the amount used in the 1920 Revision may be of interest.

In the 1920 Revision, the experience of twenty-five states was used in determining pure premiums as compared with thirty states in the 1923 Revision. In the 1920 Revision, the experience of two policy years (1916-1917) was used as compared with three policy years (1918-1919-1920) in the 1923 Revision. In the 1920 Revision, the total payroll exposure on a New York 1917 Level was $11,954,800,000 and the loss exposure on the same level $116,805,205. In the 1923 Revision the total payroll exposure on a New York 1920 Level was $30,300,027,285 and the loss exposure on the same level $232,374,728. These totals being on different bases are not strictly comparable but they indicate that the exposure in the 1923 Revision was considerably greater than that used in the 1920 Revision.

Following each revision of Workmen's Compensation rates in the past, a just criticism has always been made that while a revision of rates was being completed no definite plans looking toward future revisions were ever taken into account. With this criticism in mind, the National Council endeavored in the 1923 Revision to not only complete the Revision but at the same time accomplish something toward a foundation for future revisions. In Appendix "A" is shown the card used for converting the experience to a common Level. The actual Schedule "Z" data is posted for each policy year in the column captioned "Actual" and converted by the use of appropriate factors to the Basic Level and posted in the column captioned "Converted." Sufficient

columns have been put on the card to provide for a second reporting of Schedule "Z" and its conversion or for a change in the Basic Level. The chief accomplishment of the card, however, is the single posting of the actual experience. A summation of three years has been made for the purposes of the 1923 Revision. When 1921 Schedule "Z" becomes available, it will be entered on the cards and converted to the Basic Level and a new summation made consisting of four years experience. If at any time an earlier policy year is to be eliminated, the matter can be taken care of very easily. Four policy years can be posted on each side of the card making it available for use for all policy years from 1918 to 1925 inclusive. At any future revision, the actual experience will have already been posted on the cards and the work will then consist only of converting this experience to the Basic Level to be used. This is a considerable step forward and indicates that future revisions can be taken care of by the National Council very quickly as the actual posting will have already been done.

APPENDIX "A"

STATE CODE NO.

NATIONAL COUNCIL ON COMPENSATION INSURANCE

CLASSIFICATION

	ACTUAL		CONVERTED								
Payroll											1918
Death											
Perm. Total											
Major Perm.											
Minor Perm.											
Temp. Total											
Medical											
TOTAL											
Payroll											1919
Death											
Perm. Total											
Major Perm.											
Minor Perm.											
Temp. Total											
Medical											
TOTAL											
Payroll											1920
Death											
Perm. Total											
Major Perm.											
Minor Perm.											
Temp. Total											
Medical											
TOTAL											
Payroll											1921
Death											
Perm. Total											
Major Perm.											
Minor Perm.											
Temp. Total											
Medical											
TOTAL											

Some Observations on the Development of Manual Rates for Workmen's Compensation Insurance

S. B. PERKINS

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WRITTEN DISCUSSION

MR. S. BRUCE BLACK:

Mr. Perkins calls attention to the most difficult problem in workmen's compensation rate-making. It is relatively easy to obtain a satisfactory degree of accuracy in the relativity of rates between classifications. This relativity does not, except in a few unusual industries, appear to change radically. It seems possible, therefore, to use rather a wide experience over an extended period of years to develop a schedule of relative rates and to use this scale of relativity for a period of five years or perhaps longer.

What is needed, however, is some practical and easily explainable method of adjusting the level of rates to meet changing requirements. It is well known that any line of casualty insurance has its own cycle of high loss ratios and low loss ratios. A part of this is due to the effect of the general business cycle on insurance, and partly to peculiarities of the insurance business.

A period of profit usually results in substantial rate-cutting, the organization of numerous new companies, which in itself means more rate-cutting, until finally the business enters a period of loss, and the period of loss inevitably brings in its train a period of profit with some of the companies left along the wayside.

The general character of workmen's compensation experience tends to make these cycles especially prolonged and acute, for it takes several years for the effect of the changing loss conditions to reflect themselves in the rate level. Other businesses are recognizing the waste due to the business cycles, a waste which ultimately reflects itself in a higher cost to the consumer. They are concentrating their attention on the shortening of the cycle, thus reducing the waste.

Our immediate problem is to find a means of shortening our cycle. This can be done by making the rate level more responsive

to changing conditions, and this in turn can only be done by finding a means of reasonably accurately measuring current rate requirements upon which to base rates. We should avoid a lag of several years in the reduction of rates when rates are higher than necessary, and in increasing rates when rates are lower than needed.

Rates, as Mr. Perkins aptly points out, which do not fit the business conditions of the particular time, do cause dissatisfaction on the part of the consumer. It is recognized that a changing wage level is one of the factors determining the rate requirement, and this has been measured for the purposes of the rate revision now under way. It has also been the custom to measure changing scales of compensation benefits. It is also recognized that the frequency of accidents, or the accident rate varies rather widely with changing industrial conditions, but there has been hesitancy in introducing a measure of this into rate-making.

It is rather axiomatic that to introduce in the determination of a rate level two of the factors which modify the rate level and leave out the third, which may be of equal importance and possibly operating in an opposite direction, may give a more erroneous answer than if none of the factors were used at all.

The loss ratio projection method has its short-comings, but it at least has the advantage of measuring in some way all the factors which go into the determination of what a rate level should be. Mr. Perkins has suggested a rather practical means of bringing this more nearly up to date than what we have had in the past, by the use of loss ratios for policies terminating in respective months, thus constantly bringing the known loss experience more nearly up to date. Even this, however, will leave a substantial lag between the period for which rates are being made and that period which is represented by the latest experience.

There is objection to the use of conjectural factors. This objection is based largely upon the assumption that they are pure conjecture. If, however, it is established as a matter of fact that accident frequency does vary with industrial conditions; if it can be established just how much accident frequency has changed; if it can be established, as it has been established, that wage rates do affect the rate level and changing wage rates can be measured; and so on with the other factors; it can well be said that we are not using conjectural factors, but are using known

factors, the influence of which has been demonstrated and the value of which is measured by statistics which can be brought up to the current period.

Factors are not conjecture only because they have not already been translated into a finally determined loss rate. Knowledge of the factors which affect loss ratios and current measurement of those factors, removes them from the realm of conjecture.

It is timely also to suggest that the presumed objection to so-called conjectural factors may, after all, be much less serious from a public standpoint than the effect of having rates which are tremendously out of line with the requirements of the current period, and that we might well risk a little conjecture if, by so doing, we reduce some of the evils in the long period of "lag" which we have had in the past.

Mr. Perkins makes a second suggestion that perhaps there is a very wide variation in experience developed by groups of risks of different sizes. He suggests that the organization of large risks is of a decidedly different character than the organization of small risks and that, therefore, the resultant rate needed for the larger risk may be less than for the smaller risk. He suggests that this should be measured.

Mr. Perkins' suggestion for study has been well made. It is an indication that we are beginning to find out new things about compensation experience. It makes us realize how little we really know about the fundamental things affecting compensation experience. When we have a more complete knowledge of the fundamentals, we can make rates which will more nearly fit current conditions.

It is presumed that Mr. Perkins has discovered some evidence that the experience of different sized risks varies. We have never seen experience which indicated any consistent differences by sizes of risks. We have seen isolated collections of experience which would show either that small risks were better than large risks, or large risks better than small risks, or that by and large there is no discernible difference.

We have observed, however, that wage changes do affect loss ratios. We have observed that the frequency of accidents varies with industrial conditions, decreasing when business slumps and increasing rapidly when business resumes activity.

We have also observed that fluctuation in the amount of em-

ployment and the amount of activity in large risks is very much greater than in small risks. We have also observed that wage rates fluctuate less violently in small risks than in large risks, and that the so-called labor turnover is much smaller in small risks than in large risks.

Inasmuch as these are all factors affecting accident frequency, and inasmuch as changing industrial conditions apparently affect different sizes of risks differently, it is a reasonable conclusion that whether large risks appear to be better than small risks, or small risks better than large risks, depends entirely upon the particular point in the cycle of business changes that we happen to take for our test.

If our reasoning is sound, we would assume, therefore, that in the present period of increased industrial activity and high accident frequency, that the small risk would not have been affected by this change to the same degree that large risks have and consequently their experience would be much better.

During and after the war period when wages were unusually high and there was a consequent low loss ratio experience throughout the country, it might well be said that because of this very condition, the larger risks would have produced a better loss ratio proportionately than small risks which had not been affected to the same degree by the boom conditions.

These are some of the fundamentals of rate-making. Any investigation of experience which would throw light on the changing costs by different sizes of risks should prove valuable, but we should be cautious in accepting any evidence as conclusive unless it covers a substantial period of time under differing conditions of industry and does prove that there is over the entire cycle a real difference in the experience of risks by size. No such evidence has ever been collected—what evidence we have points to entirely different conclusions, depending on the time and place which the experience represents.