

PURE PREMIUMS FOR COMPENSATION INSURANCE

BY

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INTRODUCTION

During the last few years there has been no little agitation for the development of means of adjusting the premium more closely to the hazard of the individual risk. This has resulted in rather extensive study of the structure of the Experience Rating Plan, the adoption of the Retrospective Rating Plan in a number of states and the proposal of the Supplementary Rating Plan. The two latter plans have so far been restricted to risks developing \$5,000 annual premium, although there have been suggestions that the Supplementary Rating Plan might be extended to apply to \$500 risks. The qualifications for experience rating vary by state but in New York an average of \$500 premium per annum is required. Thus a great deal of energy has been and is being spent in finding ways to make the premium small enough on a good risk and high enough to carry a bad one, but this work has been limited to the fair sized risks and concentrated on the large ones.

It may be that the Retrospective and Supplementary Rating Plans will solve the problem on the larger risks. It is doubtful, however, whether any amendment in the structure of the Experience Rating Plan will go much farther than the present plan in producing a premium which is satisfactory both to the assured and to the carrier. Then there is the large class of risks which do not produce \$500 annual premium. In New York, excluding per capita risks entirely from consideration, this group comprises over 90% of the risks and includes more than a third of the total premium. These are not affected at all by any of the schemes recently adopted or proposed to produce more satisfactory premium results. Nevertheless in total they are important and the premium paid by each one is important to the assured even though it may not look very large to the carrier.

It is my opinion that a fair share of the difficulty in arriving at adequate and reasonable premiums for individual risks lies in

the manual rates themselves. This is especially true with respect to the non-rated risks and the smaller experience rated risks whose rates seldom depart very much from manual and which cannot possibly receive a substantial reduction. On many occasions I have found it exceedingly difficult to justify to a disgruntled policyholder the rates he is required to pay, when it appears from an analysis that not only the experience of his risk but also the experience of the entire industry in the State has been consistently favorable year after year as compared with the adopted rates. It does not help much to tell an intelligent man that the manual rate and his experience rate are both based on mathematical formulæ, when at the same time you have to admit that the good experience developed in the State has been practically ignored in making the manual rate, and that unless the experience in other states improves there is no hope for a relative reduction in rate, no matter how long the state experience remains favorable. Situations of this kind have led to this proposal to amend the generally accepted system of pure premium calculation.

HISTORY

When I first became acquainted with rate-making methods in compensation insurance they were rather crude, due partly to lack of sufficient statistical data and partly to the fact that the business was too new to have perfected a scientific approach to the problem, although much work along these lines had already been done. Confining the discussion to pure premium selection, I recall that in those days the total pure premium was divided into three sections, as it is to-day, but that the Indemnity portion was split into Death and Permanent Total and All Other rather than into Serious and Non-Serious. Few classifications had enough exposure to give a reliable indication for the Death and Permanent Total section and it was a frequent practice to combine the experience of two or several classes, sometimes an entire industrial "group," to determine the pure premium for the classes involved. Often there would be little or no real analogy of hazard among these classes but it gave a convenient method of surmounting a difficulty. The same thing was done to a lesser degree with the All Other and Medical sections. In addition, a large element of underwriting judgment

was always applied. Sometimes national indications were chosen and sometimes state, with no very clear basis for the choice. Each of the underwriters on the committee making the selections was probably especially familiar with certain industries. When these classifications came along one of the committee members would discuss at some length the hazards of the particular industry, and if he was able to persuade the other members to his opinion the pure premium would be raised or lowered accordingly. Naturally there was a good deal of horse-trading under these conditions, and a session devoted to pure premium selection might last for days. Thereafter, why a particular pure premium was chosen for a given classification was likely to be something of a mystery in spite of the effort to set down a brief record in the minutes of the meeting.

Improvement came in the shape of the adoption of state formulae. The Death and Permanent Total portion of the pure premium was expanded to include Major Permanent Partial cases, thus increasing the reliability of the experience based on the relatively infrequent, serious accidents. Criteria were established for giving full or partial weight to the state experience for a classification, and the remaining weight was given to the national pure premiums. For a time the national pure premiums were still selected on a somewhat hit or miss basis, but finally a national formula was also adopted. Underwriting judgment still plays a part, but a very minor one. Thus the selection of pure premiums has been reduced to what is very largely a mechanical process and there is comparatively little argument in committees as to what the pure premium for any classification should be.

PRESENT METHODS

I do not intend to go into detail concerning the existing system, which is well-known, but will describe briefly how it operates in New York. When the experience on those classifications which receive any state credibility has been prepared by the National Council a representative of the Compensation Insurance Rating Board sits down with a representative of the Council and in a session lasting about a day or a day and a half selects the pure premiums which will be recommended for adoption. In a large majority of cases the pure premiums produced by the formula are

selected but in a few cases some special treatment is recommended. Subsequently, the experience exhibit with these recommendations is placed before the Classification and Rating Committee of the Board which makes the official selections, usually adopting the recommendations but making exceptions in a few instances. An exhibit showing the pure premiums for the remaining classifications which receive no state credibility is also placed before the Committee and generally adopted without discussion. The latter exhibit does not show the experience on any of these classes.

The following table shows the number of classifications which received various average degrees of state credibility as well as the payrolls and premiums included in each group based on latest available payrolls:

Average Cred- ibility %	Classifications		Payroll		Premium	
	No.	%	Amount	%	Amount	%
100	83	13.5	2,354,448,000	73.6	33,072,640	68.4
75-99	114	18.6	518,440,000	16.2	8,976,557	18.6
50-74	46	7.5	76,267,000	2.4	1,793,848	3.7
25-49	89	14.5	120,077,000	3.8	2,199,416	4.5
1-24	83	13.5	72,432,000	2.3	1,322,557	2.7
0	199	32.4	55,941,000	1.7	1,001,190	2.1
Total	614	100.0%	3,197,605,000	100.0%	48,366,208	100.0%

Included in the group with 100% credibility are the four Standard Exception classifications with payroll amounting to \$1,169,694,000 and premium of \$4,147,220 representing 36.6% and 8.6% respectively of the totals.

From the above it will be seen that the rates for more than 60% of the classifications are based either wholly or chiefly on national experience. While the payroll and premium involved is a relatively small proportion of the total it is substantial and we must not overlook the fact that the individual risks in these classifications are entitled to as much consideration in the establishment of their manual rates as are the risks in those industries which happen to be more largely represented in the state. If the national pure premium is a proper measure of hazard in a particular state, these smaller industries have no cause for complaint. It is my contention, however, that frequently it is not.

OBJECTIONS TO USE OF NATIONAL EXPERIENCE

The national experience is usually one or two years older than the state experience. Thus in the latest revision the New York experience covered policy years 1930 to 1934 inclusive, while the national pure premiums were based on policy years 1928 to 1932 inclusive. When it comes to experience rating individual risks many people are disturbed because it does not appear to be practical to consider experience later than one year prior to the rating anniversary, and suggestions for using more recent experience have recently been advanced and seriously considered. The Retrospective and Supplementary Rating Plans go still further and use the experience of the policy period itself in determining the premium applicable to that period. Have we not lost sight of the fact that, in the calculation of the premium, manual rates are the controlling element on small risks; play a very large part on many experience rated risks; and have a considerable influence in the case of very large risks even though they may be subject to Retrospective or Supplementary rating? Where the national pure premium is used in whole or in part we are on the one hand quite complacent about using classification experience of 1932 and prior years, while on the other hand we want to use individual risk experience of 1936 or 1937. It is obvious that there must be a lag in the use of classification experience but it should be no greater than is absolutely necessary.

In a country as large as ours conditions of all kinds vary from one section to the next. Industries which may be of importance in the South or on the Pacific Coast may be negligible or non-existent in the Northeast. Or the type of industry covered by a given classification may be totally different in Missouri from what it is in New York. The probability of this has increased in recent years because of the reduction in number of manual classifications which has had the effect of broadening others to include more varieties of risks than before. Where differences of this nature exist from state to state there is no reason to believe that a conglomerate of experience from all states will represent the hazard of the class in any one of the states. It is difficult, if not impossible, for authorities in one state to know how its industries differ from the similarly named industries in other states. Hence, when national experience is used one must shut his eyes and hope that

the industry involved is homogeneous throughout the country. The fact that this is not always true has been recognized in selecting national pure premiums themselves where in a few obvious cases, like 0006 "Farm Labor," different pure premiums have been adopted for various sections of the country. Similar situations undoubtedly exist in other instances but since no one has definite information on the subject they are neglected.

The degree to which the application of compensation rules and rates is supervised varies greatly. Comparatively strict regulation exists in some; others are entirely unregulated and there are numerous intermediate conditions. In some, all of the larger risks and many of the smaller ones are inspected, classified and rated by a central bureau, while in others there is comparatively little centralized inspection. It seems unsound to permit experience from unsupervised states to influence or perhaps largely determine the rates for certain industries in closely supervised states.

Since the administration of compensation rules and rates in the several states is in the hands of different organizations, it is natural that classifications will not all be interpreted or applied in precisely the same manner throughout the country. A good deal of such varying interpretation is due to industrial differences of the type already referred to. For example, in connection with certain types of wood-working one rating organization may find that saw mill operation is normal and incidental and include it within the class; another may find that it is exceedingly rare and therefore separate it in the few cases where found. When experience from these two jurisdictions is combined the resulting pure premium is obviously too low for the first and too high for the second. Another cause for variation is the facilities which exist for appeals by policyholders from classifications or rates assigned by the Board or Bureau. In New York, for example, employers have a statutory right to be heard on such questions by a standing committee of the Board, with further right of appeal to the Insurance Department. This right to a statutory hearing is rather freely exercised and as a result there has grown up over the years a body of decisions which have an effect somewhat similar to the common law. When such a procedure exists classifications are bound to be interpreted differently than where the question rests on the opinion of a single individual, and there are few, if any,

appeals from his decision; or where there is little or no check on the various interpretations of dozens of underwriters.

In addition to these basic objections to the combination of experience from different states, the mechanical processes involved in the use of national experience introduce others. The experience of all states must be converted to a common level. Various methods of conversion have been used in the past but in the latest revisions three part experience differentials have been used. That is to say, for each state and each policy year there is a separate conversion factor for each of the three pure premium divisions—serious, non-serious and medical. In the 1934 national revision, for the five-year period, these factors range from less than .65 to more than 5.75, and sometimes vary quite sharply from year to year in the same state, not necessarily as a result of law amendments. It is extremely doubtful whether the conversion of experience as different as these factors indicate to a single theoretical level preserves the true relativity among classifications of which the national pure premiums are supposed to be a function. It is quite true that even within a state some conversion is necessary but the possibility of substantial error is much less in such cases because the experience is more homogeneous and the factors correspondingly closer to unity.

Under the state pure premium formulae the amount of credibility given the state experience is based on expected losses developed from the national pure premiums. The volume of expected losses required for full credibility in the July 1, 1937 New York revision, based on 25 serious cases and 300 non-serious cases, was:

Serious	\$130,000
Non-Serious	57,900
Medical	46,320

If it be assumed that the national pure premium is a sound base to start from, this procedure is logical, but it produces some rather startling results. For example, in one instance 18 serious cases costing \$67,000 have been given 100% credibility, while 38 cases with \$145,000 losses and 31 cases costing \$186,000 have been given only 50% credibility. Similarly, on the non-serious pure premium 100% credibility has been allowed for 80 cases with \$27,000 losses, while only 75% has been given for 379 cases costing \$71,000,

and no weight whatever for 180 cases with \$19,000 or for 105 cases with \$30,000. Are we supposed to believe that a serious pure premium based on \$67,000 is a more accurate indication of the hazard than one based on \$145,000 or \$186,000? Is it not more likely that for one or more of the reasons mentioned above the hazard of the class in New York is widely different from the average countrywide hazard? Where this situation exists and the industry in the state is too small to receive substantial credibility the continual return to the national pure premium as the base, year after year, serves to prevent giving adequate or perhaps any appreciable recognition to local conditions in the industry. This has come to my attention on several occasions, especially where, although the industry was comparatively small, there were one or two large risks in it and as a result of our rate-making procedure the rates developed for those risks were always out of line with their demonstrated experience. Cases like this have undoubtedly emphasized the need for special rating plans which now seems to be recognized by all types of carriers.

Another flaw in the system is that on account of varying degrees of credibility being given, the formula pure premiums on closely associated classifications are in reverse relativity. For example, the national pure premium for 3824 "Automobile Body Mfg.-N.O.C." is slightly higher than that for 3823 "Automobile Body Mfg.-pressed steel." The New York indicated pure premiums are about the same for both classifications and considerably higher than the national. However, due to the fact that 3824 receives considerable state credibility while 3823 receives none, the formula pure premium for the former is 4.21 while that for the latter, which apparently should be slightly higher, is only 3.22.

PROPOSED METHOD

In the foregoing I have sketched the practical objections to the present method of pure premium determination. The remedy proposed to cure or at least abate many of these shortcomings is very simple and by no means radical. Perhaps it might not be suitable for the smaller industrial states but I believe it would work out very well in the more important ones.

First. Only experience from within the individual state being

considered should be used. This experience should be converted to current levels in the same manner as at present but an exhibit should be prepared for every classification instead of only for the restricted number which receive state credibility under the present formula.

Second. The current state pure premiums, placed on the same level as the experience, should be used as a basis of comparison in the application of a formula similar to that now used for the national revisions but substituting the present state criteria for full credibility and making corresponding changes in the volume of expected losses required for each degree of credibility.

Third. The experience of each individual classification should be prepared separately and the indicated and formula pure premiums for that classification calculated accordingly. The experience of two or more classifications should not be combined nor should one be rated by analogy to another except in the case of newly established classifications or instances where there is very evident necessity for such action. No such combination or rating by analogy should be continued in the next following rate revision unless the same reason still exists and is just as compelling as before.

The arguments in favor of the first item in this program are the converse of the objections to the use of national experience and do not need extended discussion. They may, however, be briefly recapitulated. The experience basis will be more up-to-date and will represent the latest available policy years, thus recognizing as far as practicable, without introducing new factors such as giving more weight to the later years of the experience, recent trends in industry in the state. Local conditions including peculiarities of various industries as they exist in the state will be more adequately reflected. The experience will be more trustworthy, being developed under the same type of supervision under which the rates will be applied. The conversion of experience will be reduced to a minimum.

The need for the second item is obvious if only state experience is to be used and matters are not to be left entirely or largely to judgment. A formula of the type proposed will maintain a reasonable degree of stability even though based on a smaller volume

than the national formula. This smaller volume is justified because the experience to which it will be applied is far more homogeneous and more reliable in every respect except sheer quantity than national experience. For this reason I believe that the pure premium relativity among similar classifications is more likely to be reasonable than under the present method.

The third item is based on the proposition that if there is any reason which justifies maintaining two separate classifications for somewhat related industries, that reason must be the assumption that their hazards are different. If this is true then each one should be allowed to determine its own rate. If, on the other hand, the industries cannot be distinguished from each other, as underwriters sometimes say is the case, or if there is sufficient reason to believe that the hazards are the same even though the experience indicates the reverse, the classifications themselves should be combined. Of course, there are times when it is desirable to observe the trend of experience among a group of such classifications for an experimental period and there is no objection to combination of experience for such a purpose for a limited time.

The proposed method imposes a somewhat greater burden on the staff of the rate-making organizations because the experience of every classification must be prepared, and upon the committee which selects the pure premiums because every classification must be reviewed. However, I am firmly of the belief that this additional work will be more than compensated by the result, which should be a more accurate and defensible set of pure premiums.