

THE CENSUS METHOD

BY

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DISCUSSION BY H. T. BARBER

Aside from the advantages claimed for the census method of compiling exposures as advocated by Mr. Longley-Cook, he has drawn attention to the fact that through innovations in established statistical procedures we might accomplish substantial economies without seriously injuring the value of the resulting data. For many years the old policy year basis for compiling rate-making experience was regarded as the ideal for many important lines of casualty insurance. The policy year basis could be termed the "gold standard" for compiling ratemaking statistics. In recent times we have observed a transition to the calendar year-accident year basis for preparing data and now Mr. Longley-Cook has introduced a further shortcut. It would seem desirable to consider other means by which we might bend our procedures to yield further savings in expense without making too great a sacrifice in the dependability of the resulting experience. One such simplification in the treatment of exposures will be suggested later in these comments.

There are two desirable attributes of the original policy year basis of experience compilation which may have to be compromised in any major departure attempted for reasons of economy. The policy year method permits the rate maker to use the same available data for the dual purposes of class and territory pure premium relativity and of rate level determination. The advantage of continuity is self-evident and is of appreciable value in securing rate approvals. It is observed that if less exact methods of compiling experience are adopted, any inaccuracies so introduced will not be as critical in effect in the determination of relativity as they could be if also used for rate level data. This suggests that the census method of determining exposures might be quite acceptable for relativity purposes but it may appear advantageous to use aggregate data from a different source and more meticulously compiled, as the basis for rate level determination. It is noted that the present calendar-accident year basis for automobile insurance rates has preserved this principle of using essentially the same data for both relativity and rate level.

Secondly, the policy year basis has the desirable characteristic of approaching maximum accuracy with the passage of time. If exposures are developed for a period of time sufficient to allow the corresponding losses to mature, the developed exposures should closely approach ultimate true values. On the other hand, other more approximate methods may involve a freeze based on the calendar period in which the transactions were recorded. For example, under any calendar year exposure method if a material clerical error in assignment should occur late in the period, as in a December 1960 transaction, which is not discovered and corrected until the following month, a three-fold effect is created which might hamper the proper interpretation of the resulting data. In this case, the 1960 experience as originally recorded is in error; the

1961 experience of the same category is in error as it will contain a minus exposure item equivalent to that originally recorded; and the 1961 experience of the proper category includes an item which should be charged to 1960 rather than 1961. This illustration points up one weakness in the suggested census method as the intermittent recording of exposure may be more vulnerable to such a situation than is the usual complete calendar year basis. It is observed that transaction date is not a good statistical peg on which to hang the hat. Effective date of the coverage is better statistically though probably less convenient in many cases.

It probably can be inferred from the paper that the census method may be adaptable only to lines of insurance with large volume, with fixed premiums and with units of exposure and premium per policy which are fairly uniform in number or amount. These limitations are suggested by a desire to limit any undesirable effect of approximation to an acceptable minimum. Automobile liability private passenger per car experience and homeowners coverage as mentioned in the paper seem to offer good opportunities for the suggested procedure.

Casualty insurance ratemaking usually makes extensive use of ratios (pure premiums and loss ratios) which consist of amounts of losses for numerators and exposures for denominators. There may be various reasons for uncertainty as to the significance of the numerators, such as the future development of unsettled losses and the small credibility which attaches to finely subdivided experience. Therefore, certain approximations as respects the significance of the denominators are acceptable providing there is no bias and that the range of error introduced by the approximation is nominal. It may be pointed out that in ratemaking usually several years of experience are combined which diminishes the chance for an inaccuracy in exposure to have a substantial misleading effect.

It was previously suggested that it might be preferable to restrict census method data to the area of class and territory pure premium relativity where errors normally would not be damaging. The problem of rate level determination could be isolated and might be based on a more traditional evaluation of available data obtained from a separate source. For example, in Automobile insurance dependence for rate level might be placed on statewide calendar year incurred loss ratios, adjusted to current or anticipated conditions of loss cost and to current premium levels, for sub-lines of insurance such as private passenger per car, etc. Under such a procedure it is believed that the census method would produce many of the advantages claimed by the author without seriously impairing the reliability of the resulting rates.

If ratemaking were to be conducted by the two-step process of relativity and level it might be advisable to see whether the relativity revision could be accomplished on even a more economical and convenient basis than the suggested census method, such as, for example, using calendar year written exposures combined with accident year incurred losses. It, of course, would be necessary to adjust the current exposures for three-year or longer term policies to an annual basis. The economy and convenience of using calendar year written exposure by class, territory, and other sub-divisions without maintaining an "in-force" record should be self-evident. Also, because writ-

ten records have a greater degree of permanence than do "in-force" records the written basis might have a distinct advantage if a retroactive analysis in greater detail were found to be necessary in some particular area of experience.

It is appreciated that the use of written exposure is an unorthodox suggestion but it may be partially rationalized by pointing to a very close parallel with which the public is quite familiar. This is the principle involved in local property taxes in most municipalities. The net budget of expenditures for the coming fiscal year is determined and this amount is pro-rated among individual property owners on the basis of valuations as they appear on a common date such as October 1. In this way the amount of tax for each property owner is determined. This practice seems to be quite acceptable to all concerned and increases or decreases in the exposure which take place after the valuation date are ignored until the next time around. Thus in local taxation a single picture or one snapshot of exposure on a given date is used as contrasted with a twelve-month motion picture of exposure which is traditional in the insurance business. Why should not the same principle be adaptable in ratemaking within the area of class and territory pure premium relativity? Of course, the use of written exposure as suggested represents a still further departure since use would be made of the effective date of the policy or coverage as the valuation date rather than using a single common date for all policies such as January 1 or July 1.

It appears to the writer that this simple analogy between ratemaking and taxation practice suggests that there may be some merit in studying the use of written exposure at the same time as attention is centered on the suggested census method. Both alternatives are worthy of friendly scrutiny in view of the potential rewards of economy and convenience.

There is one final comment which occurs to the writer. Both of the alternatives of census method or written exposure involve a trade where some small measure of accuracy in ratemaking is yielded for evident advantages of economy.

Just how vital is this element of accuracy to the three parties which are critically interested in rates, namely, the carriers, the insuring public, and the State? A small margin of error is of little importance to either the State or the insuring public. As for the carriers, their major interest in accuracy should be that the rate be sufficiently exact to discourage adverse selection either by the public or as might result from the activities of competitors who might be stimulated to raid business otherwise obviously overcharged.

It seems as though we might loosen the reins on approximations in making rates which are prospective and temporary in character. This comment is not intended as an espousal of slipshod methods in actuarial or statistical practice. It is merely a suggestion that with substantial rewards in view in the form of economy, we should be willing to give more ground in the self-imposed demand for perfection in ratemaking. This, I believe, is one of the thoughts which prompted Mr. Longley-Cook to submit his valuable contribution on the census method. It seems to be in order for us to proceed to the proving ground of comparative tests to see how small are the aberrations involved in the census method and other even more approximate procedures.