TRANSACTIONS OF SOCIETY OF ACTUARIES
1952 VOL. 4 NO. 10

DISCUSSION OF PRECEDING PAPER

JULIAN M. MILLER:

Mr. Pedoe's paper is very interesting and stimulating especially to one who has been involved with the responsibility of establishing in his company an expense analysis system and has therefore had to grapple with the many detailed problems inherent in such an undertaking.

Mr. Pedoe notably accomplished his purpose of tracing the trend of expenses over a period of years and bringing to the attention of actuaries a subject which had not received the attention it deserves in actuarial literature. He outlines a simple method of obtaining an expense ratio comparable to the mortality ratio with which all actuaries are familiar. If viewed in the light of the safeguards indicated by Mr. Pedoe and if the pitfalls are recognized, such expense ratios can be just as valuable in tracing the trend of the expenses of a single company or a group of companies as mortality ratios in tracing the trend of mortality experience. I found the paper so constructive that I hesitate to point out what may be rather minor shortcomings.

The formulas which Mr. Pedoe has presented are certainly simple in application; however, it is possible that the stress on simplicity tended to produce a certain amount of obscurity in the trends and comparisons based on the formulas. No weight at all has been given to phenomena which generally accompany unfavorable economic periods such as, for example, the increase in number of terminations. Certain segments of the business, such as supplementary contracts not involving life contingencies, and dividends on deposit, which are of much greater importance in some companies than in others, have been ignored. Such items are responsible for considerable expense. No distinction is made between participating and nonparticipating business.

The factor of $\frac{1}{4}$ of 1% of mean net ledger assets to represent expected investment expenses, while apparently satisfactory for Canadian companies, is not necessarily applicable to American companies. Mr. Pedoe recognizes that the factor would apply only to such companies having a relatively modest proportion of real estate mortgage loans in their investment portfolio. For United States companies, the $\frac{1}{4}$ of 1% is in general too low. In fact, it is generally recognized that the $\frac{1}{4}$ of 1% may be sufficient to cover only so-called general investment expenses and that specific investment expenses, including items relating to real estate holdings, are additional. The trend toward investments in housing further tends to make

the $\frac{1}{4}$ of 1% of mean net ledger assets deficient in representing expected investment expenses of a number of United States companies.

In the application of the formulas, it was not clear to me whether under "Renewal" the number of policies and sum insured in force at the end of the year represented the total number and sum insured in force or the net after making a deduction for new insurance.

It would have been instructive if Mr. Pedoe had outlined the principles which he used in apportioning expenses to number of policies, amounts of insurances and premium income. There is no doubt, as he stated, that the personal element is a leading factor in this phase of expense analysis as it is in so many other phases of the subject. Apportioning expenses to number, amount and premiums is of prime importance actuarially because it is fundamental in adapting the results of expense analyses for purposes of asset shares, premium rates, guaranteed values and dividends.

CHARLES F. B. RICHARDSON:

I should like to congratulate Mr. Pedoe on this most stimulating and timely paper. I received my first instruction on expense analysis from Mr. Pedoe as one of the students of the Canadian Study Circles of twenty years ago to which he refers.

The technique used by Mr. Pedoe involves the application of factors which must be arbitrary to the enormously varied operations of different companies. No matter how skillfully the factors may be chosen, and even if they appear to give reasonable results for groups of companies in the aggregate, this process may well produce a spurious result for a particular company. No investigator can possibly have the intimate knowledge of each company's peculiarities that is required to make a completely fair comparison between individual companies. I am sure Mr. Pedoe fully realizes this, and my comment is intended as a caution against expecting too much of this approach rather than as a criticism of his excellent work.

It is for these reasons that none of the expense formulas used in the various insurance publications give sound results. For example, in the *Life Insurance Fact Book* there is published each year a so-called expense ratio comprising the ratio of all home office and field expenses to premiums and net investment income. This, obviously, is a completely meaningless statistic which can lead to dangerously erroneous conclusions.

The same limitations apply in the case of a similar technique which we used in the Mutual Life in an attempt to make over-all expense comparisons between companies. Our approach involved the calculation of the ratio of actual to expected expenses in other companies, using the expense rates of our own company. It happens that we make a rather elaborate

functional cost study each year and we computed a set of 44 different expense factors involving both insurance and investment items which were available in the annual statement. We excluded agents' commissions, medical and inspection fees, taxes, direct real estate expenses and premiums on mortgages acquired. One of the most intractable items in making studies of this kind, particularly for U.S. companies, is the difference in accounting between branch office and general agency companies. In general agency companies a large part of the field expenses are accounted for as overriding commissions to the general agent, but these items are not segregated in the annual statement, being buried with commissions paid to both general agents and soliciting agents. Incidentally, the result of this method of remuneration is that general agency companies tend to show a lower first year and a higher renewal expense rate than branch office companies, because in practice most general agents derive their profit from renewal operations being conducted at a substantially lower rate than their overriding commissions. In order to segregate soliciting agents' commissions in our study, it was necessary to obtain the figures from the companies.

In applying a company's own expense rates to the business of other companies, it is obvious that several tacit assumptions are being made, among which are the following:

1. That the apportionment between first year and renewal expenses in one company is appropriate for what may be quite a different type of operation. As Mr. Pedoe says, there is much room for difference of opinion as to the basis of apportionment.

2. That the ratio between first year and renewal expenses in other companies is the same as in our company. This is certainly not true especially in a general agency versus a branch office company.

3. That the frequency of the operations per policy, or per thousand of business, that go to make up the total expense rate is the same in all companies, which is obviously not true. It will depend on the type of business being done, the market covered, and so on. For instance, the total renewal expense rate will depend on such items as the average premium frequency, rate of surrender and lapse, number of settlement agreements per thousand policies, etc.

4. That the expense rates inherent in one investment operation are applicable to, possibly, a quite different type of operation in another company. Investment operations must be judged in relation to the yield and the rate of investment profit or loss, just as selection expenses should theoretically be related to the mortality experience.

There are other limitations to this method. For instance, even though

one's own company may have a complete functional cost analysis, the results can be applied only to the items available in the annual statements of other companies and this frequently necessitates the use of items less appropriate than the units that would be used in a study of one's own company.

In our formula we used different expense rates for six broad classes of investment, and in each class separate rates of expense were used for investments acquired, owned, and disposed of, respectively. We have consistently found very large differences in the rates of expense on different types of investment. For example, in our company the rate of expense on acquisition of industrial bonds (many of them privately placed) averages over double the rate on other types of bonds (excluding governments), while the rate on mortgages is ten times the rate on industrial bonds. The rates of expense for supervision of investments owned show similar wide variations by type. These figures will of course vary widely in different companies.

Another disturbing item of great importance in certain industrial companies is monthly debit ordinary business which has expense rates quite different from regular ordinary business.

In our experiments we used various other formulas besides the formula based on our own functional cost studies, involving different apportionment between first year and renewal expenses, so as to see the effect of the widely different rates of growth of different companies. While this made significant changes in the ratio of actual to expected expenses in some instances, the ranking of the companies was not affected as much as we expected. We did find, as has Mr. Pedoe, that the largest companies showed lower ratios than the medium-sized and smaller companies, as one would anticipate because of the lower rate of overhead expense due to mere size.

The treatment of commissions in Mr. Pedoe's analysis may perhaps produce greater distortions than any other item. The varying rates of growth of different companies, combined with the usual commission pattern, can hardly fail to upset the results for individual companies and may even affect the ratios for total expenses in a period of rapid expansion. This is particularly true in companies using high commissions in the early policy years rather than the traditional level renewals for nine years, and Mr. Pedoe indicates that he fully appreciates this. I have wondered whether the trend of the ratios would be affected if commissions to soliciting agents were excluded.

Mr. Pedoe questions whether expense formulas which show ratios of new to renewal expenses as high as 10 to 1 can be justified. I think it all

depends upon the purpose of the formula. If, in a branch office operation, expenses are charged to the first year in an extreme manner, the ratio might well be higher in a perfectly sound operation. The expense of operating agency offices today, according to analyses made for the L.I.A.M.A. by a group of companies, averages between $6–8 per M first year and 35–40 cents per M renewal, a ratio of 15 or 20 to 1. If we add to this commissions and home office expenses the ratio will probably not be below 10 to 1, unless a large part of home office expenses and managers' salaries are charged to the business as a going concern. Indeed, if a narrow and severe view were taken of the apportionment between first year and renewal expenses, it would probably be very difficult to avoid showing a substantial loss on an asset share calculation for several policy years and the minimum cash values required under the Guertin laws could not be justified. Mr. Pedoe covers this point very well in his "Review of Expense Ratios" where he states that new business expenses are comparable to the capital expenses of a manufacturing concern. This does not mean that we should not know precisely what these capital expenses are, but it does mean that as a practical matter they cannot be charged against the policy in the first policy year.

Mr. Pedoe is to be admired for his courage in tackling a most difficult subject in his usual forthright manner.

KENNETH B. PIPER:

I should like to make a very brief comment. In any analysis of expense we are dealing with a subject which is of interest to people other than actuaries. For that reason, I hope we can use some such phrase as "formula expense" instead of "expected expense."

(AUTHOR'S REVIEW OF DISCUSSION)

ARTHUR PEDOE:

I thank Messrs. Miller and Richardson for their complimentary references to the paper but I do wish they had supplemented their remarks by some figures from their files on the main thesis of the paper, namely, the recent trend of life insurance company expenses. The paper was written more with the smaller companies in view, as the huge companies Messrs. Miller and Richardson serve have the necessary expert staff to make the most infinitely detailed analyses of their operations. The actuary of the smaller company faced with the problem of his company's expenses and

how they compare with competitors operating along similar lines is in a different position.

The subject of Expenses (particularly when dealing with ratios rather than procedure) is a very difficult one and I believe this is the first time in actuarial literature that the question of comparative expense ratios of life insurance companies has been the subject of investigation.

Mr. Richardson refers to the monthly debit ordinary business of industrial companies. I would point out that no industrial-ordinary company was included among the twenty companies whose figures form the basis of my paper. His statement as to the "completely meaningless statistic," namely, the ratio of total company expenses given in the *Life Insurance Fact Book*, indicates a different attitude from mine. My thought on seeing these ratios is a desire to exclude the figures dealing with Industrial and Group business and to see the trend of the balance. Each figure to me is merely the stepping stone to a further analysis and each ratio should be studied to see what can be learned from it before going on further.

The twenty companies whose figures are the basis of the paper transact business on very similar lines, particularly so if each of the three groups be considered apart from the others. Where they may vary in operations is in the system used for remunerating their agents and I stressed in the paper that it was the total cost which counted.

Mr. Miller refers to expense allowances for termination costs and supplementary contracts and amounts on deposit. I would add to this list the cost of handling claims and maturities which in a more stable economy, as with the life offices in Great Britain, for instance, might be quite appreciable in relation to total costs. None of these allowances would have affected to any appreciable extent the figures in the paper, yet the point should be noted. However, from the point of view taken in this paper the servicing of claims, lapses, surrenders and maturities should be included in the cost of the business; expenses of handling amounts left on deposit should be allowed for in the investment expenses. The ideas of functional costs, as the cost of issuing a policy, etc., and the over-all cost of doing business as outlined in the paper are quite distinct.

While doing the work on this paper I did form the opinion that the $\frac{1}{4}$ of 1% allowance for investment expenses did favour the largest Canadian companies. However, we have no "housing projects" operated by life insurance companies in Canada.

Mr. Piper's point is a very important one and merits the attention of those working on expense ratios. The term "expected expenses" could be readily misunderstood.

Canada has been described as a three-thousand-mile ribbon less than a hundred miles wide and not a continuous ribbon at that! The most recent developments in natural resources have taken place to an appreciable extent in areas practically unknown to man, subject to the harshest conceivable climatic conditions; and all this for a total population of fourteen millions. It would follow that Canada is an expensive country to do business in and in any comparison with expense figures of business in other countries if this be taken into account the achievement of Canadian life insurance will appear all the more outstanding.