

PREMIUMS VARYING BY AMOUNT AND SEX

- A. To what extent has recognition of size in life insurance premium rates been accepted by the states? What requirements, if any, have been imposed on companies writing such business, *e.g.*, (1) must all plans be included, (2) how many and what class ranges are acceptable, (3) what dividend adjustments, if any, to existing policyholders are required?
- B. To what extent has recognition of sex in life insurance premium rates been adopted? What means have been used in granting insurance to women on a different rate or dividend basis than men? What have been the practical problems as to valuation, nonforfeiture values, or policy forms in trying to use male rates with a setback in age? Are better techniques available? Are lower insurance rates for women particularly appropriate in companies with a premium or dividend structure graded by amount?
- C. Are there advantages to a company in retaining a "special" form of policy for rate variations rather than making premium adjustments to regular issues for size and sex variations? Are there disadvantages in issuing a "special" policy to provide rate variations?
- D. How do expense rates compare with those in the past? To what extent have variations been offset by changes in average policy size? What are some of the more unusual measures taken to curb expenses? What impact would increases in expense rates due to inflation have on a premium structure graded by policy amount?

MR. R. W. WALKER, introducing section A, stated that because of antidiscrimination laws premium rates in the past had not been varied by policy size. Such laws were interpreted to permit rates to vary by plan and age but not by amount. Within this pattern "Specials" developed with a special plan defining a class for rate purposes. In the meantime, the quantity discount principle, after being sanctioned through U. S. Public Law 15, became recognized in other lines such as workmen's compensation, fidelity and garage liability. A significant development occurred at the NAIC meeting in May 1956, where the Special Subcommittee of the Life Committee sanctioned the application of the principle in the Ordinary life insurance field by unanimous vote.

Mr. Walker stated that, although the report was advisory and not binding on any state, sanction by most states came with satisfactory promptness when the Northwestern Mutual filed its graduated premium structure with the various states later in the year. Their Law Department could find nothing in the laws of the states requiring specific approval of the principle of gradation by size, since the determination of "what is a class" seemed to be left open. Nevertheless, they felt they should seek approval following the procedures used for policy forms.

After securing straightforward approval in their home state, Wisconsin, and then in New York, they then filed in the remaining states in which the company operates, *i.e.*, all except Florida, Louisiana, Mississippi and Texas. A particularly helpful feature in the filing was that no change in policy forms was necessary and no policy form involvement complicated matters. The principle of gradation had to be approved or rejected on its merits alone. A simple, direct statement of the proposal was submitted to the states with request for approval, although further data were available if necessary.

Since the filing was treated as a regular policy contract submission, there were three classes of states to deal with: (*a*) those requiring specific approval before use, (*b*) those requiring only filing before use with no specific approval necessary, and (*c*) those in which approval is automatic if no action is taken by the state within a specific time limit. Affirmative letters of approval were quickly received from a number of states. In Arizona, a prompt approval was later withdrawn, but on further reconsideration approval was again given without change or modification.

Mr. Walker said Arkansas, Colorado, Illinois, Montana, South Carolina and Oregon disapproved initially. In the first five of these the anti-discrimination law of each state was given as the basis for disapproval, but in each case extended discussion resulted in approval. Oregon objected to the number of size groups and the amount of differential in rates between the groups, and was the only state to raise this question. They received approval from Oregon after demonstrating the appropriateness and reasonableness of their proposals. Minnesota set up three requirements:

- a*) companies will be required to submit statistical data in summary form substantiating their gradation schedules;
- b*) companies will be required to apply the principle to all plans, not only permanent plans; and
- c*) companies will be required to treat present policyholders equitably through a form of distribution or dividend to pass back the expense savings on larger policies already issued.

New York and Connecticut inquired into the retroactive feature under (*c*), and Mr. Walker assumed that any dividend modification on existing business would require justification in New York.

Affirmative approval or acknowledgement in writing was received from all but three states, and Mr. Walker felt it was one of their most satisfactory filing and approval experiences.

MR. D. G. SCOTT stated that the Continental Assurance Company,

prior to the May 1956 NAIC report, had decided on the policy fee method, and planned to charge a fee of \$2.50 annually for each thousand of the first \$4,000 of insurance. After the report, they wrote each state requesting approval of their proposal, stating that, with their present distribution of paid-for business, they would receive from the policy fee an amount sufficient to take care of renewal overhead. They also indicated that they would be filing policy forms shortly on which premiums would be levied in such a manner, and asked if the states would find it possible to approve them. The new policy forms were required because of other changes which required filing.

Most states answered that the proposal would not be considered discriminatory, although some states advised they should be prepared to demonstrate that the difference in premiums per \$1,000 was justified by actual expenses. Other states indicated that it would be necessary to have a policy form filed before they could approve the method of levying premiums, and still others indicated disapproval since any rate differential was discriminatory. Mr. Scott said that Kansas, Massachusetts, Minnesota, New Jersey, Ohio, Oregon and Pennsylvania approved only after an elementary demonstration was furnished showing that the renewal expenses were reasonably close to the proposed fee.

They then filed policy forms with the statement that premiums for the policies would be graded by size according to the method previously discussed. The policy forms were approved in all states, even though some had previously raised a question of discrimination. Oregon and Ohio said that if one plan had premiums graded, then the method must be applied to all plans. Oregon also required that all plans have the same minimum, the only exception being term plans which were allowed a higher minimum because of their low premiums. As a result, they are now issuing all their plans with a \$1,000 minimum, except on term plans where the minimum is \$4,000. On their Participating Modified Life and Life Paid-up at 90, Oregon permitted them to use a "negative selling device" by eliminating commissions entirely where the policy was issued for an amount of less than \$4,000.

MR. L. A. CANNON, speaking on section B, stated that on June 1, 1950 the Great-West introduced a participating Life at 85 policy with a \$10,000 minimum in the United States written exclusively on females who are above average medically, morally and financially. About 10% of their total female business by volume has been written on this plan with an average policy of over \$20,000.

No age setback is involved and premium rates are reduced only for the higher average size of policy, the lower female mortality being re-

flected by increased dividends. The reduction in mortality rates assumed for females in their 1957 dividend scale amounts to 10% in the first year, increasing to 25% in the sixth and subsequent years. The mortality allowance is scaled down after age 65 to 5% at ages over 85. Mr. Cannon pointed out that a 3-year age setback assumes a reduction in female mortality of approximately 25% between ages 35 and 70. He stated that, with a nonparticipating plan, some allowance for mortality could be given in the premium rate, while still holding values based on the true age.

Comparing their method with the age setback method, Mr. Cannon said that the age setback method had the virtue of simplicity since it does not require the calculation of special rates, values or dividends. However, it gives only approximate effect to the mortality differential expected. It appears that a three-year age setback does not make enough allowance in mortality at the younger ages and makes perhaps too great allowance at ages over 80, although practically only a small amount of business will survive to the extreme advanced ages.

Under their method it is easier to change the mortality allowance to females as conditions change. Their method results in higher premiums and values than the age setback method, but not necessarily in higher surrender net cost. Mr. Cannon feels the age setback method may give too favorable results in the early policy years. For example, a three-year setback at age 60 would lower the premium by \$8 to \$9 on Ordinary Life. With female mortality 60% of male, the select mortality differential the first year would be only about \$3.50. Under their method the appropriate difference in net cost by duration can be made more easily than by using the age setback.

With the age setback method, the cost savings to females will be very similar for different companies even though there are marked differences in net costs for male lives. Their method bases the allowance to females on their own mortality experience rather than arbitrarily relating it to male net costs. However, the requirement of a separate dividend scale for females, particularly where a number of plans is involved, complicates the printing job and necessitates duplication in promotional material.

MR. M. A. LAIRD stated that the 1957 *Who Writes What?* listed seventeen companies recognizing sex in life insurance premiums. The methods for a rate differential for women are:

1. Premiums, dividends and nonforfeiture values based on those for males, set back, say, three years uniformly.
2. Premiums set back but nonforfeiture values held at original male age.

3. Premiums for women having no direct mathematical relationship, such as an age setback, with regard to male premiums.
4. No premium differential, but different dividends.

There are several practical problems in using male rates with a setback in age. The states of California, Oregon, Missouri, Washington, New Jersey and Maryland hold that the minimum values under the standard nonforfeiture adjusted premium method must be determined by using the CSO Table with the true age and rate of interest specified in the contract for nonforfeiture values. Maryland prefers separate policy forms for females. Texas holds that until a table is specifically promulgated for females and adopted, the assumption must be that male and female mortality is identical, since the only formal table is the CSO Table, which does not recognize any sex differential.

Premium deficiency reserves may result if the gross premium charged is less than the net premium on the CSO true age method using the rate of interest specified in the policy for nonforfeiture values. California uses this test, even though arguments may be advanced that the CSO Table set back three years and a rate of interest of, say, $2\frac{1}{2}\%$ satisfies the aggregate tests required by many states.

As to technique, Mr. Laird said that the age setback method had much to commend it. Administration is simple, for in all punched card records the female need only be considered a male three years younger. There is a psychological sales advantage in the setback method. While the three-year setback is not exact as to actual female mortality compared to male, it is a safe assumption in practice. Legislation is under way in a few states to eradicate the nonforfeiture and valuation problems.

Use of the technique of separate dividend scales will increase administrative costs, but it avoids nonforfeiture and valuation problems and would fit well with the promulgation of a female mortality table.

Where a cost differential is offered to women, the main concern is to ensure that the female average size policy on that form is not so much smaller than the male as to offset the more favorable mortality. For a company employing size bands, the male and female average will tend to be close together. Although there is no ceiling in the largest size band, the average size is assured of being large and per policy expenses will not vary greatly by sexes when put on a per thousand basis. However, the setbacks may well vary by size groups (and by plan groups within a size group). The problem of a person in one size band finding that, for the same premium, slightly more insurance could be bought in the next higher size band will be heightened if the person is a female and the next higher size band has a greater age setback.

MR. G. F. KNIGHT, speaking on section C, pointed out that we are in an era of rapid change, with competition affecting pricing policies. Reviewing special plans, he said that in many cases preferred underwriting selection had been required, but that in competition it was not always strictly enforced. The practice of assuming a higher interest rate for specials is still in use, although Mr. Knight found it difficult to justify. As to loading, high minimum amounts reduce the expense charges, as do reduced commissions, restricted frequency of premium payment and limited availability of settlement options in some cases. The number of special plans issued by a company has been held to a minimum, so that unless the special fitted the particular need, there was no way of reaping the rewards of the reduced pricing concept. The substantial volume of business resulting from specials takes attention away from price inequities between plans, although there is a saving compared with issuing a small volume on a large number of plans.

Mr. Knight pointed out that grading premiums by size grants cost advantages to all plans; he believed that with the passage of time more and more companies will move along this line. The techniques of grading by size are independent of selection restrictions and interest assumptions. By increasing commissions on the larger size bands, some companies have stressed the cost differential by policy size to the agent. A disadvantage is the problem of integration with policies already issued.

Mr. Knight felt that even though the basic element in the rationale underlying specials will have been removed under grading by size, we are likely to find them continued in combination with grading by size. He feels that when legal restrictions are removed, most companies will adopt lower rates for women.

MR. J. A. CAMPBELL stated that with the adoption of grading rates by policy size, it is difficult to see any advantages in retaining a "special." Formerly, special plans seemed to be the way in which expense reductions could be granted for larger policies so as to avoid the question of discrimination. Select underwriting and premium payment limitations also helped create a separate group.

The London Life introduced its first special whole life plan in 1922, and later added limited life and term plans. One problem created by "specials" is that of reduction in amount below the minimum amount. Since these special plans had select underwriting, any understandard applicant had not only an increase in premium but also a change in plan.

Mr. Campbell said there was also the question of some inequity between policyholders taking the same amounts of insurance on plans where "special" policies were not available, and, in fact, found it difficult

to see how "special" policies could be made available in connection with endowment contracts.

The London Life eliminated select underwriting toward the end of their experience with "specials." For a good many years they had been insisting on changing the application for anyone eligible for a preferred plan who applied on a "standard" plan. For over two years they have been grading premiums by amount, with very satisfactory results. They were able to reduce the number of policy forms quite substantially and now have no need for rewriting policies if the amounts are reduced or other changes are required. The only advantage of a "special" plan which may still remain is that it is possible to glamorize a "special" policy more easily than a simple discount for size.

MR. ARTHUR PEDOE, discussing section D, referred to the investigation on expenses made by him yearly for the Canadian Association of Actuaries. Details of the basis of this investigation were given in his paper in *TSA IV* and the only change since the paper had been written was that the allowance for investment expenses for mortgages was increased to $\frac{1}{2}\%$ as against $\frac{1}{4}\%$ for other investments. In the paper there were four sets of expense factors used, but in the Report to the Canadian Association of Actuaries the results on Formulas 3 and 1 only were given. Formula 3 emphasizes cost per policy and begins with \$25.00 per policy, \$5.50 per \$1,000 of insurance and 70% of premiums, all relating to new business, with corresponding factors for renewal business, annuities, group and investment costs. On the other hand the factor for Formula 1 is \$9.00 per \$1,000 and 65% of the premium, both relating to new business, with corresponding allowances for renewal business, etc.

The variation of the ratios of actual to expected expenses and size of policy are given in the accompanying table by the above formulas for

YEAR	"L" COMPANIES			"S" COMPANIES		
	Average Policy	Ratio of Actual to Expected Expenses		Average Policy	Ratio of Actual to Expected Expenses	
		Formula 3	Formula 1		Formula 3	Formula 1
1939.....	\$2,423	93%	106%	\$1,829	97%	132%
1950.....	3,942	99	107	2,966	107	130
1952.....	4,369	101	108	3,269	112	132
1954.....	4,391	105	110	3,667	118	135
1956.....	5,983	109	111	4,428	120	132

two of the three classes of Canadian companies investigated. The "L" companies are mainly international companies doing a considerable volume of business in the United States and some business outside of the North American Continent, all of which are well over one billion dollars of business in force. The "S" companies are each under half a billion dollars of insurance in force and their business is mainly confined to Canada; this has considerable influence on the size of the average policy. The average policies given of the new business for the years specified are basic sums assured, excluding family income benefits and other temporary additions to a basic sum assured. The average policy including the latter benefits in recent years would increase the averages given by approximately 20% for the "L" companies and 10% for the "S" companies.

Referring to these figures, Mr. Pedoe drew particular attention to the results by Formula 3 where the expected expenses are on a per policy basis and stated that current per policy costs are, in his opinion, far above the figure assumed, but that investigations indicate that increasing the per policy cost would not affect the trend of costs as shown in the table. Since the war the trend indicating the cost of handling policies has been consistently and definitely upwards as shown by Formula 3 in spite of the substantial increase in the average size of the policies written. This upward trend in average policy means that older business has a much lower average sum assured and undoubtedly this is a factor in the trend of total costs.

Mr. Pedoe referred to the results by Formula 1 where the cost per thousand is the determining factor. Here for the "L" companies the trend is still upwards, but for the "S" companies the trend is not so definite. With Formula 1 the increasing average policy would tend to offset the increasing cost of handling policy units. The "S" companies have a substantially higher cost per unit than the "L" companies and the fact that some of the "S" companies are "growing up" cost-wise is, in Mr. Pedoe's opinion, one reason for the indefinite trend of the costs of the "S" companies by Formula 1 in recent years.

In giving these figures, Mr. Pedoe stated that their significance could readily be misunderstood. Expenses should be related to the loadings in the premiums for expenses or better still to the margins in office premiums after providing for reserves and claims. In other words, expenses should be related to surplus earnings. Higher surplus earnings in recent years could well absorb higher overhead costs and still give the public a lower net cost. This brought him to the point of the effect on expenses of

a premium structure graded by policy amounts. Provided that when rates are reduced for larger amounts the rates for smaller policies are correspondingly increased, the position of a company is not affected. However, he argued that such a graded premium structure tends to concentrate policies in amounts at the points where the reduction in rates applies and so, when introduced, it gives a definite hoist to the average policy. As most of such rate structures favor the smaller policy against the larger, every increase in average policy is beneficial to the cost factor.

Mr. Pedoe inquired whether there are figures available indicating the relative increase in clerical services by similar institutions such as banks and trust companies and even of the clerical services in industry. Life insurance companies have to compete with other business for staff and in his opinion the increasing costs would, on investigation, be shown to arise mainly from salaries and other charges associated with salaries such as pensions and staff benefits.

MR. C. F. B. RICHARDSON said that the Mutual of New York had been making a complete functional cost analysis yearly for 13 years, the methods used being substantially those in his paper in *RAIA XXXV*. Also a budget is used to make forecasts of expenses on a departmental basis and is reconciled with actual experience every four months. Extensive use is made of forecasts of future operations and their effect upon future surplus earnings.

They have also had for several years a work measurement program under which standards of time performance are determined for each of the routine operating procedures, and the actual results are compared with the standards for each operating unit. These standards are also used to break down salary costs to arrive at functional costs for the line operations.

In their agency operation they compile each year the rates of first year and renewal expenses for each agency for the more important items of expense. These figures are furnished to each manager so that he can compare his agency with all the others. They believe that their managers' compensation formula has contributed substantially toward the reduction of agency expenses through the use of an expense factor varying with the proportion of business obtained from new agents. This factor pays extra compensation to the manager with a low expense rate graded according to the rate of recruiting and it reduces the compensation where there is a high expense rate as compared with the company standard, again graded according to the rate of growth. Mr. Richardson believed

that an expense factor which takes no account of the proportion of business from new agents is unsound because it ignores the dual objectives of growth and low operating cost.

It is not a simple matter to compare current expense rates with those in the past because the result depends to a great extent on how the expense rates are expressed. There have been substantial changes in the last 13 years, not only in the average new policy, which has nearly doubled, but also in the distribution of business by plan and in the average new premium per thousand, which in his company has dropped by about 25%. In addition, there have been reductions in premium rates during this period. Their average policy in force has increased by about one-third in the last 13 years.

Ignoring these factors for the moment, first year costs expressed as a percentage of premium reached a peak about 1949 and have since declined to about the same level as in 1944, in spite of the reduction in premium rates. If first year expenses are expressed on a per thousand basis, they are now substantially below the 1944 level, but the average premium per thousand has also declined during this period. Renewal expenses, on the other hand, have definitely increased since 1944, but have remained about level since 1948, whether they are expressed as a percentage of premium or on a per thousand basis; renewal expenses per policy have increased by about 50% since 1944. General overhead expenses, which are expressed as a percentage of all other expenses, have changed very little in the last 10 years. At the present time somewhat less than half of their total expenses (excluding commissions) are assessed as first year expenses. This is a relatively high proportion considering their moderate rate of growth and they believe it to be realistic.

As to the effect of expenses on net costs, this, of course, depends on how the expenses are assessed in the dividend formula. In their case they use the fund, or asset share, approach to test the dividend formula. The expense factor in the dividend formula is arbitrary and has no refined meaning in itself, although the expense factors used in the fund calculations are realistic and are derived from the functional cost analysis as described in his paper. During this period some changes in the method of assessment of expenses have occurred. First year expenses are expressed partly as a percentage of first year commissions (these are the selling expenses), partly on a per policy basis and a small portion on a per thousand basis, while renewal expenses are expressed partly on a per policy basis and partly as a percentage of premium. The trend of the unit expense rates over a given period will, therefore, vary by plan and age. Taking a Whole Life policy at age 40, the first year expenses, if they are all ex-

pressed on a per thousand basis, are slightly below the level of 10 years ago, while the renewal expenses are a shade higher.

Mr. Richardson thought that on an over-all basis they may conclude that the combination of a substantial increase in the average size policy, together with the economies that have been made through the various efforts made to control costs, and the increased mechanization that has taken place over this period appear to have prevented their unit costs from rising. It may well be that the advent of the electronic era may see a reduction of unit costs in the future—particularly renewal costs—unless further inflation dissipates the savings that might otherwise be anticipated.