

GROSS PREMIUMS AND DIVIDENDS

- A. To what extent are the following influences being reflected in premiums, dividends and settlement options?
1. Recent improvement in mortality, particularly at the higher ages.
 2. Trend in interest rate.
 3. Federal taxes.
 4. Changes in agents' compensation.
 5. Other increasing expenses.

MR. A. L. JOYCE thought that this topic strikes at the heart of the life insurance business in that there is certainly nothing more important than the dollars you receive for the risks you take. He felt the balance between the three principal factors—mortality experience, interest earnings, and operating costs—which determine life insurance premium rates has undergone a significant change in recent years. Despite low interest rates and unavoidable increases in operating costs the trend in mortality has justified a broad reduction in premium rates, or in the case of participating contracts, in net cost to the policyholder.

After pointing out that the changes in nonparticipating premiums are usually more marked than changes in dividend scales, as the latter theoretically reflect changes over a relatively short period of time, Mr. Joyce outlined the thinking behind the recent reduction in the Connecticut General's nonparticipating rates. In revising their premiums they followed the approach of using realistic rates for each of the three principal factors and then injecting a margin for safety, rather than using a safety margin in each factor which they felt would bury the total safety margin and not present a uniform incidence by plan, duration and age.

Of outstanding note is the fact that the reductions in mortality for the older ages are proportionately much larger than for the younger ages. This is historically unique in the business and reflects a gain in expectancy for the middle and older ages which has developed in recent years altering the earlier pattern in which mortality improvement was shown largely for the younger ages. On Retirement Income policies, if the maturity value is

being changed at the same time, the mortality gain which makes possible a lower charge for life insurance also means a longer period of life income. This, in general, would mean that at the higher ages at issue the rates are likely to be somewhat higher than on previous scales and for the younger ages about the same or slightly lower.

For a number of years they have maintained an extensive mortality file and have noted the gradual improvement in mortality at the higher ages which began around 1940 and which is verified by mortality studies published by the Society. They feel the development is permanent and it is significant that the improvement coincided with introduction of the so-called antibiotics which no doubt are at least partially responsible for the improvement.

The mortality table used as a basis for the rates was based on their own experience from the policy anniversary in 1940 to the policy anniversary in 1949 for the first ten policy years. The experience published by the Society covering policy anniversaries from 1946 to 1949 was used after the fifteenth policy year. For policy years eleven to fifteen, inclusive, they were guided by both their own experience and that published by the Society. This is the first time they have departed from the traditional five-year select period in the treatment of mortality. For ages eighty and higher the basic experience for the CSO Table was used. The result is a mortality table which they are convinced is a safe one for nonparticipating rates and they actually feel that future mortality may even be lower but that the improvement will be very slow unless some outstanding discovery is made in connection with cancer or diseases of the heart and circulatory system.

Mr. Joyce then gave two tables which demonstrated the difference between their new mortality table and that formerly used as the basis for their rates.

NEW AS A PERCENTAGE OF PRECEDING TABLE

AGE AT ISSUE	POLICY YEAR						ATTAINED AGE	
	1	2	3	4	5	11		16
25	69%	71%	74%	83%	88%	84%	94%	40
35	90	86	86	81	82	84	91	50
45	85	77	70	66	66	66	95	60
55	68	62	57	55	55	55	88	70
65	60	57	54	53	54	62	100	80

Expressed in another way the dollar reduction in mortality per \$1,000 at risk in their new rates as compared with their old rates is as follows:

REDUCTION PER \$1,000 AT RISK IN NEW TABLE

AGE AT ISSUE	POLICY YEAR						ATTAINED AGE	
	1	2	3	4	5	11		16
25.....	\$.30	\$.33	\$.33	\$.23	\$.17	\$.33	\$.20	40
35.....	.11	.20	.24	.39	.46	.82	.77	50
45.....	.37	.78	1.30	1.86	2.34	4.72	1.03	60
55.....	2.22	3.50	5.02	6.61	8.23	15.52	6.46	70
65.....	6.96	9.80	13.35	16.99	20.39	30.57	0	80

Their investment people felt they could not safely assume, for the period over which new policies would be in force, a net interest rate before taxes of more than 3%. Since they treat Federal income tax, Connecticut investment tax, and possible losses in principal as a charge against the net interest rate, they felt they could not safely assume an interest rate above 2.6% in the rate calculations.

In discussing expenses, Mr. Joyce pointed out that a few years ago the Connecticut General adopted a modern form of career agents' contract with heaped renewals followed by a service fee and extensive security benefits. Such direct charges were recognized in the rates. Also, after looking at the trend in expenses in field offices and in the Home Office to obtain realistic expense factors, it became evident that they should require a larger minimum policy than had been the case in the past. They adopted a minimum of \$2,500 unless the annual premium was \$50 or over, in which event they would issue as low as \$1,000.

In closing, Mr. Joyce pointed out that it is a most significant situation to see the life insurance industry improve its product, do a better job for the public, and at the same time reduce its price which is contrary to most trends in the merchandising field.

MR. HARRY WALKER discussed the trend since 1948 in the mortality experience, expense rates and earned interest rate for the Equitable (N.Y.). While there has been an increase in administrative expenses and some increase in agents' compensation, the situation has been alleviated by the level of new business written, an increase in their average size policy and by the improvement in mortality at virtually all ages, as reflected in their 1945-1950 study relative to their 1940-1945 experience. Despite

the Federal income tax they have felt justified in maintaining the distribution rate of interest in their dividend formula at the rate used in their 1950 formula. The combined effect of the changes in all of the factors entering into the dividend formula has been an appreciable increase in the dividend scale if the 1952 scale is compared with the 1948 scale.

In discussing their participating immediate annuity contracts, Mr. Walker stated they used the so-called "equalization" dividend method which, broadly speaking, applies the gross consideration less provision for first-year and renewal expenses to provide income on the basis of a distribution rate of interest and an experience table of mortality. For the experience table in their 1952 dividend scale they used the α -1949 Table with Projection B (with some modification at the very high ages) which is a fair representation of their own experience. This has had the effect, in general, of appreciably reducing dividends at the young ages and appreciably increasing dividends at the high ages as compared with their 1951 dividend scale. Coincident with the change in the dividend mortality basis, they made provision in the dividend formula for a general increase in administrative expenses for immediate annuity contracts.

In time we may find the Jenkins-Lew studies and the results of the latest intercompany settlement option study reflected in the rate basis for life income settlements and in the dividends apportioned under life income settlements based on older guarantees. In Mr. Walker's opinion these two problems are interdependent, as the adoption of a new rate basis for life income settlements should affect our thinking with respect to dividends that should be apportioned under participating life income settlements based on less conservative guarantees.

MR. F. D. KINEKE indicated that the improved outlook for interest rates evidenced during the past few years was primarily responsible for a reduction in the Prudential's premium rates for long term Endowments and Limited Payment Life policies at issue ages under 30.

He pointed out that the effect of an improvement in the interest rate is naturally felt at all ages, but it is not nearly so important a factor at the older ages because of the difference in the number of years the policies have to run to maturity. Furthermore, the Prudential found that the increase in expenses which had already taken place, together with the necessary provision for further increases in expenses which were almost certain to take place, fully offset the improvement due to the higher interest assumptions at the middle and older ages.

The reduction which became effective in October of last year amounted to about \$3 per thousand at age zero for Limited Payment Life policies requiring premiums for twenty years or less and smaller amounts for poli-

cies with longer premium payment periods. The amount of the reduction decreased with age to zero at age 30 and applied to Weekly Debit, Monthly Debit and Regular Ordinary policies.

MR. N. D. CAMPBELL gave a review of the extent to which the various factors outlined in the question had been reflected in the Canadian premium rates and dividends of Canadian companies.

He indicated that many companies have changed their premium rates since 1947. The new premium rates and dividend scales incorporated a more favorable mortality table, a somewhat lower rate of interest, and expense factors at about the same level as before. These rates reflect varying degrees of improved mortality including improvements at the higher ages, over that shown by the various tables developed from the basic data of the CSO Table. This has resulted in reductions in rates on the cheaper plans of insurance without much change in the rates for investment plans.

After making inquiries from seven representative Canadian companies, Mr. Campbell indicated that there is more or less agreement that although the mortality experience has improved over the past two years, this improvement is comparatively slight and has not been too significant at the higher ages. This improvement has not as yet been reflected in premiums or dividend scales except by a few companies in their rates for Preferred Risk plans.

In commenting on the upward trend of the earned interest rates of Canadian companies, Mr. Campbell pointed out that from a rate-making point of view the increase is of comparatively recent origin and although present indications are that the trend will continue upward, very few companies have as yet reflected such an increase in their premium or dividend scales. In this connection he pointed out that the interest drop was not followed all the way down in the 1948 or subsequently adopted premium and dividend scales.

These statements do not hold in connection with Single Premium Annuity rates which a number of Canadian companies have revised recently. The new rates are based on mortality tables developed as a result of the Jenkins-Lew paper and various approximate methods of providing for improvement in mortality have been adopted. At the same time, the interest assumption has been changed and now reflects the higher yields obtainable on new Canadian investments.

Mr. Campbell observed that although the rising trend in expenses has been apparent ever since the war years, it is only in the past one or two years that the full impact of higher costs has been felt. While the increased rate of expense has been offset to a great extent by an increased average new policy, the effect on business already on the books has now become of

significant proportions. Although dividend scales have not generally been adjusted to take these increased expenses into account, many companies are currently studying the problem and there is no doubt that increased costs will be taken into account in the next change of dividend scales. He felt it is fortunate indeed that the effect of these increased expenses has been deferred until now when they can be offset to some extent at least by increased earnings.

A development which Mr. Campbell believes is of considerable interest is the trend experienced by most Canadian companies toward an increased proportion of Term and Preferred Risk plans. In the Crown Life they are studying the effect of this on the loading portion of their dividend. They feel that if the trend to low premium plans continues, with fewer policies sold, companies may find their per policy costs increasing more rapidly than other costs.

In closing, he pointed out that few changes have been made in Optional Settlement Tables since these tables are on a participating basis in many companies and allowance for future experience will be made in the dividend formulae. The few companies who have introduced new Optional Settlement Tables, including the Crown Life, have incorporated a mortality factor which makes provision for improvement in mortality. He expressed surprise that more companies have not announced changes in their Optional Settlement Tables.

MR. W. B. WAUGH pointed out that the 1937 Standard Annuity Table is still alive and going strong with most companies continuing to use it for settlement options in spite of the fact that it is now almost three years since Jenkins and Lew published their monumental paper which was hailed as heralding the burial of this old table. He feels that practical difficulties and competition may explain why most companies have not left the Standard Annuity Table and then pointed out some of the difficulties involved in using the new table for contracts sold in New York State.

His discussion was based on consideration of an annual premium deferred Retirement Annuity which provides optional annuities from ages 50 to 70, with cash and paid-up values available at all durations.

The 1937 Standard Annuity Table is the basis for the standard nonforfeiture legislation in New York for deferred annuities and, for the type under consideration, the law appears to require that

- (i) The cash values must be not less than those determined by finding the value of the annuity at the latest optional retirement date on the 1937 Standard Annuity Table, and filling in the intermediate values by a Guertin formula.

- (ii) Any cash surrender value must be at least equal to the value on the 1937 Standard Annuity Table of any paid-up nonforfeiture value then available.
- (iii) The value of paid-up nonforfeiture annuities must be at least as great as the value of the optional incomes available at any anniversary, both values to be found by use of the 1937 Standard Annuity Table.

The first provision effectively puts a minimum on the value of a given amount of contractual annuity at age 70, this minimum being its value on the 1937 Standard Annuity Table. This causes some difficulty if the contractual annuity has a long guaranteed period since mortality is somewhat heavier at advanced ages on the Jenkins-Lew Tables than on the 1937 Standard Annuity. As an example he gave the following table from which it is apparent that the condition would not be satisfied by the a -1959 Table if the contractual annuity has a twenty-year guarantee.

	COST OF LIFE ANNUITY OF \$10 MONTHLY AT AGE 70			
	Without Refund		20 Years Guaranteed	
	Males	Females	Males	Females
Standard Annuity 2½%	\$1,158	\$1,387	\$1,936	\$1,992
a -1959 2½%	1,220	1,414	1,931	1,960

Since the paid-up values on this type of contract are obtained by accumulating the cash value to maturity and dividing by the value of an annuity at the maturity age, the value of the paid-up annuity at time of default on the 1937 Standard Annuity Table is

$$\frac{(CV)(1+i)^t \cdot \frac{S_{(12)}}{a_{70}^{(12)}} v^t}{\frac{N_{(12)}}{a_{70}^{(12)}}} = (CV) \frac{\frac{S_{(12)}}{a_{70}^{(12)}}}{\frac{N_{(12)}}{a_{70}^{(12)}}},$$

where

(CV) is cash value

$\frac{S_{(12)}}{a_{70}^{(12)}}$ is on the 1937 Standard Annuity Table

$\frac{N_{(12)}}{a_{70}^{(12)}}$ is on a new annuity table.

This indicates that the second requirement—that the cash value be greater than the value of the paid-up nonforfeiture value on the 1937 Standard Annuity Table—is satisfied.

For (iii) we must have the value of this paid-up income greater than the value of any optional income available at the time of default of premium. That is

$$(CV) \frac{\overset{S}{\underset{\cdot}{\ddot{a}}}_{70}^{(12)}}{\overset{N}{\underset{\cdot}{\ddot{a}}}_{70}^{(12)}} \geq (CV) \frac{\overset{S}{\underset{\cdot}{\ddot{a}}}_x^{(12)}}{\overset{N}{\underset{\cdot}{\ddot{a}}}_x^{(12)}}, \quad \frac{\overset{S}{\underset{\cdot}{\ddot{a}}}_{70}^{(12)}}{\overset{S}{\underset{\cdot}{\ddot{a}}}_x^{(12)}} \geq \frac{\overset{N}{\underset{\cdot}{\ddot{a}}}_{70}^{(12)}}{\overset{N}{\underset{\cdot}{\ddot{a}}}_x^{(12)'}}$$

where x is the age at default. This puts a limit on the slope of the annuity curve. For example:

AGE x	RATIO OF COST OF \$10 MONTHLY AT AGE 70 TO COST AT AGE x AT 2½%							
	Without Refund				20 Years Guaranteed			
	Standard Annuity		a -1959		Standard Annuity		a -1959	
	Male	Female	Male	Female	Male	Female	Male	Female
50.....	.546	.588	.536	.554	.821	.787	.789	.743
60.....	.712	.741	.695	.704	.939	.902	.913	.880

This requirement does not appear to be so difficult to meet where only one type of annuity is given. However, if the contract is normally written without refund, but with optional incomes available each year on a long guaranteed basis, then more difficulty would be found in meeting the requirements and in fact it might be found necessary to redraft the contract.

Mr. Waugh felt the law could be compiled with by other than the 1937 Standard Annuity Table without too much difficulty, but wanted to call attention to the amount of thought that the New York companies must give to this particular law before changing their settlement option basis.