

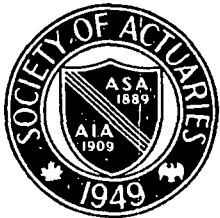


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ACTUARIES CANNOT SELL ANYTHING

by Arthur Pedoe

One of the subjects for discussion at a recent meeting of the "Younger Actuaries" of the Canadian Institute of Actuaries was "Actuaries Cannot Sell Anything." As one of just two "older" actuaries present I was moved by the expressions of frustration from the younger members of our profession when they are pitted against the salesmen of mutual funds and so-called "advisers" to pension funds. The sense of responsibility of these younger actuaries appeared to them to be a handicap, and the frustration when the business went elsewhere left its mark.

Perhaps this sense of responsibility can be carried to an extreme. One of the younger actuaries was concerned at the possibility, when arranging a pension plan for an employer, that the plan might prove too costly and in a period of business decline and financial stringency might even bankrupt the employer. How different from the salesman whose success is governed solely by the magnitude of the sale and who is inclined when he meets resistance to throw caution to the winds and allow his optimism as to the future to soar to the skies!

In the last ten years life insurance has been losing ground as a long-term savings medium and the actuary's caution may be blamed as the cause. At a recent Society meeting figures were quoted indicating a doubling of life insurance assets in the period compared to a greater increase in almost every form of saving and a ninefold increase in the assets of mutual funds.

But the reason for this is not the actuary's lack of salesmanship but the curse of inflation. I would agree that most top executives of the life insurance

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THE FIRST AMERICAN ACTUARY

by Frederic Seltzer and Steven I. Alin*

Dr. James H. Cassedy's article, *The Actuary*, May, 1969, on "Actuarial Science in 18th Century America" has prompted us to further research. We have focused our attention upon two of America's earliest actuaries.

The Pelican Life Insurance Company of London was founded in 1797 and in 1809 extended its operations to the American continent. In its "Articles of Association" the position of actuary was defined: "The actuary shall receive all applications for insurance and annuities, and make all necessary inquiries respecting the same, under the instructions of the Board of Directors, calculate the respective premiums and prices of Annuities, and report the same to the Board, and if approved, prepare the policies and Bonds which shall be signed by the President, and at least one director, and countersigned by said actuary." On March 10, 1812 the Pennsylvania Company for Insurance on Lives and Granting Annuities, chartered as an outgrowth of Pelican Life, appointed as its actuary, Jacob Shoemaker. To our knowledge, he was the first American actuary to have the title.

The Pennsylvania Company was a small operation, however, and it was not until the formation of the Massachusetts Life Hospital Insurance Company in 1823 that sizable actuarial operations were performed.

Massachusetts Life sought Nathaniel Bowditch, the renowned mathematician of Salem, Massachusetts as its actuary. After several months of negotiations, Dr. Bowditch accepted the position for the sizable sum of \$3,000 annually and Massachusetts Life began operations in August 1823. During his 15 year reign

*Mr. Alin is a student of the Society.

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OPINION 8 AND ADJUSTED EARNINGS

by Mary Hardiman Adams

Two accounting problems were discussed at the May meeting of the Actuaries Club of New York by Henry F. Reiss, Jr., C.P.A., of Ernst & Ernst, and E. R. Miller, C.P.A., of Peat, Marwick, Mitchell & Co. They discussed the accountants' problems and their approaches to actuarial practice in connection with pensions and life insurance.

Mr. Reiss, whose topic was "How Accountants Deal With Problems Arising from the Implementation of Opinion 8", said that in examining the actuarial information required by the Opinion, one of the items which accountants look for is consistency from year to year in cost methods and actuarial assumptions. Particularly, however, they are concerned with the materiality of any differences between the actual level of funding and the required level, computed in accordance with Opinion 8 of the Accounting Principles Board. His firm, so far as actuarial assumptions are concerned, is interested only in changes which may have a material effect on liabilities and contributions, except with respect to interest where they look for a realistic valuation assumption (10 per cent could be too high!!)

Ernst & Ernst also looks for consistent treatment of both realized gains and losses and unrealized appreciation in funds. Unless changes in benefits or contributions, assumptions or cost methods occurred during the year, the form developed by his firm to collect pertinent information requires only the unpaid past and prior service costs, the actuarially computed value of vested benefits and total annual contributions.

In computing the value of vested liabilities, most actuaries use a "going concern" basis which is the intent of Opin-

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Sales	Benefit (for frequency of .008)			
	Ruin Probability =	Under 5%	Under 1%	Under .1%
1000		38	33	28
1500		42	38	31
2000		45	41	34
∞		63	63	63

Interested parties could recast the table to get the probability of ruin for specific sales level, frequency and benefit, which is the orthodox way of presenting results in this field.

If we expect a given frequency, on average—whatever that means—we'll get it and all this risk charge folderol will not be needed. Let's make the uncharitable and unsubstantiated assumption that our high-school students have their hands full with ruin theory and are not about to learn about distribution of surplus, so unnecessary risk changes emerge as additional profit. The table below illustrates expected extra profit as a percent of premium for selected values of the true frequency and benefit. The three values of benefit are for 1500 sales, .008 assumed frequency point, and ruin probabilities of 5%, 1% and .1%.

True Frequency	Benefit		
	\$42	\$38	\$31
.006	25%	27%	31%
.008	16	20	25
.010	8	12	19

This table may develop a (presently latent) management interest in ruin theory.

A very important qualification was attached to the phrase "extra profit" in the above paragraph—that qualification of course was "expected." With as few as 30 companies in the sample we anticipate that one or two will see their expected profit become an actual loss. If one of the brighter high-school students re-invents reinsurance the thirty companies can make beautiful margins together.

A particular company with 1500 sales and a .008 frequency is 95% sure of having 18 or fewer claims; thirty such companies are 95% sure of having an average of 13.2 or fewer claims. (That scraping noise you heard was the shift from Poisson to normal distribution). Hence the student referred to in the prior paragraph can work out a thirty-company balance sheet as follows:

Premium available for benefits	=	\$22,500	(30 x 1500 x \$.50)
95% Safe Claims Assumption	=	16,632	(30 x \$42 x 13.2)
Profit	=	5,868	
Profit per company	=	189	(5,868 ÷ 31)

(The distribution of the total profit among the companies and the reinsurer was done with Nash's Bargaining Solution—otherwise known as split the difference). Note that each company has traded an "expected extra" profit of \$240 (1500 x .16) for a guaranteed profit of \$189. This may seem silly, but we should remember that a profit was already built into the retention so this \$189 is all "gravy" and the \$51 of extra "expected extra" profit we forego may be worth it since reinsurance safeguards the basic profit in retention. Remember, insurance companies abhor risk.

In closing, a few comments are in order. First of all, the decision on expected frequency is the single most important part of the analysis and is often the most difficult. The garbage in, garbage out syndrome is at least as significant in risk theory as in data processing. Secondly, the salvage factor would greatly complicate the analysis and while that aspect can perhaps be ignored in a \$40 benefit plan the introduction of this extra dimension is mandatory in other applications.

Finally, the magnitude of the risk factor is tremendously sensitive to the exposure and in business problems it won't be as big an element as it is here.

Peter L. Hutchings

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ion 8. Some actuaries, however, use a "plan termination" basis and, to date, Mr. Reiss' firm has accepted such figures. Most companies do not show in their annual reports the amount of vested liabilities if these are covered by assets; they do, however, show the amount of any deficit, in compliance with Opinion 8.

Opinion 8 according to Mr. Reiss has provided a workable basis for accounting for the cost of pension plans. At the same time it leaves to the accountant's judgment the key item of materiality.

In a different vein, Mr. Miller discussed the accountants' problem in not having an audit guide applicable to the preparation of annual reports to stockholders of life insurance companies. The accountants' responsibility to the stockholders is to have the annual report reflect the true financial picture of a life insurance company. The differences between "generally accepted" accounting principles and "statutory" life insurance company accounting can affect the earnings per share and stockholders' equity amounts which are properly of great concern to management, stockholders if not to the policyholders. In a rapidly expanding life company, management can be discouraged when the result of its efforts is decreased earnings per share; stockholders and potential stockholders may feel that the business is not a good investment, and policyholders might consider cancelling policies.

Mr. Miller cited portions of an annual report of a client of his firm, illustrating some of the accountants' difficulties. Significantly different results were obtained under valuations made by life insurance company security analysts and under valuations made by methods currently accepted by the State Insurance Department, the SEC or the New York Stock Exchange. This report alone, in order to comply with generally accepted accounting principles, required a plethora of footnotes to cover a multitude of items and this did not add to the clarity of the report.

Mr. Miller stated that they are now trying to write an audit guide for life insurance companies but questioned its immediate acceptance by either the accountants or the life insurance industry. In the meantime, the accountants must use their best judgment as to disclosure in annual reports. □