



SOCIETY OF ACTUARIES

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State Taxes

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by life insurance companies in California in 1970 was \$62,100,000. If the life insurance industry had been paying at a rate of 11% on a Federal "piggy-back", the amount of taxes paid in California would be \$25,400,000 which would have been a loss of revenue to the State of California of about \$36,700,000. If the life insurance industry is carrying such a heavy tax burden at a state level why haven't there been proposals to go to a state income tax basis?

There are many advantages of premium tax from the viewpoint of legislators and tax administrators:

1. Insurance companies project an image of being a huge reservoir of liquid funds.
2. The premium tax is sufficiently indirect to avoid political repercussion to the general consuming public.
3. It is relatively easy to collect and administer.
4. It provides stable and growing source of revenue.
5. It is readily adjusted to help meet revenue needs of the State.

Many in the insurance industry have felt that from our viewpoint it has some advantages:

1. It is relatively easy to compute.
2. Its stability renders it readily susceptible to actuarial treatment.
3. Companies have learned to live with it.
4. Many believe a portion can be passed on to the policyholder.
5. It avoids the distorted picture involved in an annual accounting for net income.
6. Whatever the inherent defects, there are no practical alternatives.

Points 5 and 6 are the ones which the industry people would mention most strongly when questioned but these are

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GENERAL PURPOSE FINANCIAL STATEMENT

by Clayton A. Cardinal

The current examinations of the proper life insurance reserve to be taken into a general purpose financial statement presented in conformity with generally accepted accounting principles (GAAP) have resulted in much controversy. This article sets forth the writer's opinion of that which constitutes a proper insurance reserve for a general purpose financial statement. This reserve is presented as comprised of three elements: an "expected value" element, an "insurance risk" element, and a "catastrophe" element.

The essence of the controversy involves the resolution of the question of what constitutes a proper definition of *expenses* of a life insurance company and the *matching* of those expenses to revenue. The philosophy that life insurance represents a service contract and, therefore, should be accounted for under GAAP by matching profits to "services" performed is rejected.

Premium and investment income together is considered by the writer to be a theoretically correct definition of revenue. Premium alone, however, is recognized as an acceptable definition of revenue for the purpose of matching.

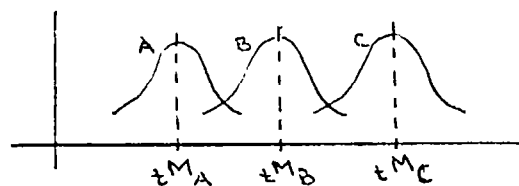
The typical method of funding life insurance expenses is the level premium method. The pattern of premium revenue is known well by life insurance actuaries. Thus it remains necessary only to identify the insurance expenses and to match such expenses to revenue.

The expenses considered in pricing an insurance product examined in this article are:

- (1) the universe defined by expected values including acquisition, maintenance and benefit costs;
- (2) statistical fluctuations to be expected in the manifestation of the universe as defined by the expected values;
- (3) expenses not considered in the definition of this universe.

Any advanced funding of expected expenses requires that an appropriate reserve be established. This reserve, an expected value reserve, is identical to the natural reserve defined in the 1970 December exposure draft of Audits of Life Insurance Companies, which is based on "realistic" assumptions. The basis of this identity is one of pragmatism inasmuch as these "realistic" assumptions do in fact define a universe and are, in the common construction of that exposure draft, identical to those expected values used in pricing the insurance product. The expected value reserve results in a proper matching of the expected expenses and the related expected value revenue.

Some observations are now made about the effects produced by the natural reserve method of accounting for a universe defined by the expected values. Consider the following graph:



Each of the three curves defines for sake of illustration the distribution of expected values in some year t for universes A, B, and C, respectively, with ${}_tM_A$, ${}_tM_B$, and ${}_tM_C$ representing the related expected mean values. Let B represent the universe contemplated by the natural reserve method and ${}_tM_B$ the related "realistic" assumption for year t . What accounting effect results if universe A or C represents in fact the true universe? That is, what happens when ${}_tM_B$ does not represent a proper definition of the universe that shall manifest itself? Does a proper matching of expenses to revenue result?

Inasmuch as the expected value revenue has been based on ${}_tM_B$ rather than ${}_tM_A$ or ${}_tM_C$ and the accumulation and release of expected value reserves are thus also based on ${}_tM_B$ in part, a mismatch results. Is this improper? Some hold that the

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effect of the mismatch should flow through the intraperiod general purpose income statement and that this is what is contemplated by the exposure draft. Others hold that such an intraperiod accounting of the mismatch is not contemplated by the exposure draft and that only statistical fluctuation of an accurately defined universe should receive intraperiod accounting. This latter position is subscribed to by the writer and is based again on pragmatism. Consider the following.

No universe can be properly defined by a given set of expected values. All that can be said is that the actual values evolving with the passage of time should in aggregate define a universe which is closely approximated by the assumed universes. If a preponderance of C-type universes manifest themselves when B-type universes have been assumed in the determination of the gross premium, a solvency question may arise. If a preponderance of A-type universes manifest themselves, a company may theoretically experience difficulties in selling its products. In either case, mismatching of revenue and expense does result for any intraperiod accounting. How should the intraperiod mismatch be accounted for? Should it be within the period as mentioned or does some other method produce a better and more appropriate matching?

Those who hold to the release from risk reserve method feel that this method produces a proper matching. Except for experimental forms of insurance the expected differences between the M_C 's and the M_B 's may not be large, and accordingly the expense curve over time as represented by the release from risk reserve method should closely follow the expense curve over time represented by the M_C 's. The release from risk reserve method has been elsewhere demonstrated to be sensitive in part to the values of the universe evolving. Reserves are built up and reserves are released, depending on the "total" persistency of the policies making up the universe. This dependency of the release from risk method on "total" persistency and the fact that the resulting pattern of expenses produced thereby may not represent the actual pattern to be expected is viewed by the writer as a possible weakness in the release from risk reserve method. Furthermore, this method is designed to produce reserves more conservative than that required by the expected values, thus ignoring in part the balancing effect of manifesting A-type universes. These facts lead the writer to consider another approach.

It is necessary to determine an insurance risk reserve, in addition to an expected value reserve, based on statistical measures of the difference in the universe actually manifesting itself during an intraperiod and that which has been assumed. Under this approach when A-type universes are manifested in an intraperiod the reserve is appropriately written up and when the C-type universes are manifested the reserve is appropriately written down. The theory is:

- (1) The going-concern philosophy holds that, over the long run, values equal to the expected values of the assumed universes will manifest themselves.
- (2) The expected value revenue has been determined on the basis of the expected values of the assumed universe.
- (3) The operation of the insurance risk reserve produces in an intraperiod a value more closely represented by the expected value reserve which, in turn, results in a better matching of expected value revenue and expected expenses and of actual revenue and actual expenses including reserves for future deferred expenses.
- (4) The ultimate value of the insurance risk reserve theoretically is zero.

If in fact the universes have been improperly defined and if the expected expenses have been underestimated, the insurance risk reserve would of course deplete.

The second item of consideration of concern in determining premiums is the statistical fluctuations which can be expected to occur in the expected values. In pricing an insurance product a surcharge must be included in the determination of premiums in order to minimize the possibility of corporate insolvency as a result of any "pure" statistical fluctuation in the expected values. That part of premium necessary to fund the surcharge, herein called the surcharge premium, has the same expected revenue pattern as does the expected value revenue since it is related

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State Taxes

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no longer valid. Until recently there was no generally accepted net income tax for life insurance companies. The life insurance industry has now lived with the Federal 1959 Revenue Act and seen that it works. There have been no indications that this act has caused any unfair advantage to accrue to a particular segment of the life insurance industry. The Federal tax base would seem to be a reasonable base for state purposes.

We can look at the present state income tax laws applying to regular corporations to see how the income tax would work. Approximately 40 states have entered into a compact to use the three factor formula for allocating income by state for tax purposes. The three factors are payroll, property, and gross receipts, and the arithmetic average of the separate percentage for each of these three factors is the allocation percentage used. The use of these three factors for life insurance companies would, I believe, cause some serious problems. The payroll factor might be difficult to define so that there is no unfair discrimination between those companies operating on branch system and those operating on general agency system.

The property factor might also cause some difficulty since the life insurance companies have intangible property in the form of bonds and equity investments. The state of domicile of the issuing corporation would not be a satisfactory plan of allocation. If the property factor were used, the equitable way of allocating property would seem to be in the same proportion as insurance liabilities. It would be possible to allocate life reserves, dividend accumulations, coupon accumulations, and the like with a little effort. Claim liabilities, particularly incurred and unreported claims, might pose an interesting problem. The receipts factor would not be too hard with regard to direct premiums but probably the income from property would have to be allocated in proportion to the property allocation factor. It would seem that over the long term, using direct premiums as a single factor would give the least distorted results. □

PLUS CA CHANGE**Pollution: 1632**

Extract from *Natural and Political Observations Mentioned in a Following Index and Made Upon the Bills of Mortality*. By John Graunt. 1662.

12. It follows therefore from hence, what I more [70] faintly asserted in the former Chapter, that the Country is more *healthfull*, then the City, That is to say, although men die more regularly, and less *per Saltum* in *London*, then in the Country, yet, upon the whole matter, there die fewer *per Rata*; so as the Fumes, Steams, and Stenches above-mentioned, although they make the Air of *London* more equal, yet not more *healthfull*.

13. When I consider, That in the Country seventy are Born for fifty eight Buried, and that before the year 1600 the like happened in *London*, I considered, whether a City, as it becomes more populous, doth not, for that very cause, become more *unhealthfull*, I inclined to believe that *London* now is more *unhealthfull*, then heretofore, partly for that it is more populous, but chiefly, because I have heard, that 60 years ago few *Sea-Coals* were burnt in *London*, which now are universally used. For I have heard, that *Newcastle* is more *unhealthfull* then other places, and that many People cannot at all endure the smoak of *London*, not onely for its unpleasantness, but for the suffocations which it causes.

REVIVE THE OLD PART ONE

Mutualist (Winter, 1972). field publication of Mutual Life of Canada, ran a fine feature, "What is an actuary?" which began:

"If you asked the man on the street to define an actuary for you, what do you think the answer would be? You're right—the answer would be the same as if you asked for a definition of a sparger or a xebec or a gobemouche."

Reading this opening helped us to come up with this short definition of an actuary:

An actuary is someone who knows the definitions of sparger, xebec, and gobemouche.

Announcement

The World Directory of Historians of Mathematics, containing about 700 names and addresses indexed by countries (40) and research specialties (about 300), is now available from *Historia Mathematica*, Department of Mathematics, University of Toronto, Toronto 181, Canada. Price: \$4.00 (\$3.00 when payment accompanies order) in U.S. or Canadian funds.

Spelling Bee

"Our proofreaders are not always as eagle-eyed as they should be and we apologize to . . . Judge DeShetler for having (consistently) misspelled his name . . ." *The Actuary*, February 1972.

"In last week's issue of *The National Underwriter*, the name of Stanley Goldblum . . . was misspelled . . ." *The National Underwriter*, May 6, 1972.

Financial Statement Insurance Reserve

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linearly thereto. How should the surcharge premium be accounted for in any intra-period general purpose income statement? Should it be deferred in whole or in part? Although the necessity of including such a surcharge in the determination of gross premiums is recognized, the writer's opinion is that when the surcharge premium is accrued, it should flow unencumbered to earnings. The accountants' position that absorption of purely statistical fluctuations is a proper function of retained earnings and that such fluctuations accordingly should be reflected in the income statement is acquiesced in by the writer.

Expenses excluded from the expected values used in defining the universe are now considered. The expected values as represented by the typical statistics used in pricing insurance policies generally do not anticipate all the expenses to be experienced by an insurer as a result of its operations. Such expenses are real, recognized by insurers and provided for in the pricing of most insurance products. What are these expenses and do they require the establishment of a reserve?

Generally, the expenses not reflected in the typical statistics used in determining expected values are those resulting from war, natural catastrophes, epidemics, recessions and the like. Also included here are those expenses which occur as a result of mandates of governments. Experimental forms of insurance also call for extra provision in the gross premium determination. These expenses taken together are herein called catastrophic expenses. A practical method of recognizing them in the premium calculation is to increment in the case of withdrawal, mortality, and other costs and to decrement in the case of interest the expected values otherwise used. Another method makes provision directly therefor in the premium loading. As a consequence of these methods of providing for the catastrophic expense, the resulting funding pattern of the related revenue must necessarily follow the same revenue pattern as does the expected value revenue. However, it must be recognized that the manifestation of such expenses is generally acute and must be reserved for.

One method of matching the catastrophic expenses with the related revenue calls for the accumulation in part of the related revenue in a fund—a catastrophe reserve—to be dispersed with the occurrence of a catastrophic expense. In this way, the catastrophic expense is matched with the related revenue. The writer has reservations that the provision for such expenses in the release from risk reserve method results in a proper matching.

The proper insurance reserve to be taken into a general purpose financial statement is seen to be that reserve comprised of

- (1) an expected value reserve;
- (2) an insurance risk reserve; and
- (3) a catastrophe reserve.

The writer's opinion is that such a reserve presents a theoretically correct matching of expenses and revenue. The preceding ideas on an accounting system based on "expected performance" are further suggested as a proper basis for accounting for dividends and realized and unrealized capital gains and losses on equity investments. Although there are practical problems which must be solved in implementing the reserve system endorsed herein, they are not unsolvable.