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THE INVESTMENT YEAR METHOD

Moderator: DANIEL J. McCARTHY, JR. Panelists: THOMAS A. SKIFF, THOMAS C. SUTTON

MR. THOMAS A. SKIFF: I would like to cover four basic areas this morning.

1. A description of our products and marketplace.
2. How our Investment Year Method is used to determine the credited rate.
3. Our system for applying the credited rate to specific accounts.
4. How the entry into this market has affected our investment policy.

In the area of products description, we have several different flexible payment annuity contracts and riders custom designed for specific markets. The riders are offered in conjuction with our Modified Premium Whole Life Policies (commonly known as Deposit Term Policies) and our Annual Renewable Term Policies under the name "LifeCycle". These combination life and annuity products represent a viable alternative to the more traditional forms of permanent insurance - that is, Whole Life, and are actively marketed as such. While certainly not a panacea, we feel LifeCycle offers a superior rate of return, as well as tremendous flexibility in that the policyholder has total latitude in determining when and how much to put into the "saving" side of the insurance program.

We also have both single payment and flexible payment contracts specifically designed for the I.R.A. and Keogh markets, as well as the general non-qualified markets.

At the end of 1978, our inforce was still relatively small, only $26,000,000 in Accumulated Value, but anticpated to grow rapidly. The distribution by product was as follows:

	Accumulated Values
Single Payment IRA & Keogh	10%
Flexible Payment IRA & Keogh	25%
Single Payment Non-Qualified	50%
Flexible Payment Non-Qualified including riders	15%
	100%

Each of the products have the following features:

1. Payments are highly flexible. Even our "single" payment contracts will allow future payments to be made at any time and in any amount, although this is discouraged. We have a company policy of not accepting more than $100, 000 at one time, but exceptions have been made on a case by case basis.

2. All contracts provide for a guaranteed rate of interest - 6% for 5 years, 4% thereafter.

3. All contracts also include a current interest provision which enables us to declare a current interest rate which will apply in lieu of the guaranteed rate. The current interest rates are essentially based on the actual investment returns of the company and, of course, current money market conditions and competitive considerations.

4. The rate declared at the beginning of the year will apply for that entire year. The rate declared for new deposits will also apply for the entire year,but we reserve the right to change that rate at any time for deposits received after that point in time. For example, if we declare a rate of 8% on new deposits in January and then in June the marketplace has a dramatic drop in rate, we can reduce the interest credit on deposits made after June, but would still pay 8% on deposits made before June.

5. All of our annuity contracts have no front-end load. One of our riders does have a front-end load, that is,the interest rates are applied to only a portion of the payments. This loaded rider, however, has a substantial additional benefit feature in the form of a "waiver of premium".

6. All of the products have surrender charges that apply for a period of time. The shortest period is 5 years, and our most recent products have a modest permanent surrender charge.

7. These annuities are marketed through our individual life field force that is essentially made up of independent property/casualty agents, brokerage general agents, and PPGA's. We have sold some business through New York Stock Exchange firms but this is not a major market for us. Perhaps this is why our sales were less than $20, 000, 000 last year compared to the $300, 000,000 plus of our larger competitors. We consider the New York Stock Exchange distribution system, with its emphasis on large single premium business, overly persistency sensitive in direct relation to money market trends and one that we wish to utilize only in a very limited way.

We have found that the market is very sensitive to the credited rate. During the last quarter of 1978, we did not increase our credited rate even though interest rates were increasing in the marketplace and the competition was increasing its rates. Our sales dropped dramatically in this period. We increased our rates effective the first of the year and sales have begun to pick up. Unfortunately, interest rates continue to rise so we are going to have to bump our rates again.

We also found that people had more of a tendency to not make additional payments rather than surrender their policies. This gives us some encouragement with respect to the lapse risk but may be more an indicator of our significant surrender charges in the early contract years rather than a true indication of the persistency on a long term basis.

The entry into this market and the crediting of excess interest required a number of changes in our traditionally non-par only company. One of the basic decisions, made early in the game, was to treat the investments of this line as a segregated portfolio within the general account. This means that the total investment income for the line is determined by the return on specific assets. Our accounting and crediting methodology must deal with the problem of equitably distributing the investment income to policyholders.

We set three goals for this methodology.

1. The underlying investment accounting approach should be reflective of an investment year method but need not be so theoretically accurate as to produce "perfection" rates of return.

2. The year to year determination of rates to be credited should be virtually automatic but leave room for management discretionary control.

3. It must be capable of being contractually defined and verbally communicated. I would hasten to add that the method is not contractually defined in our current contracts for two reasons. First, it had not been defined when the contracts were worded and second, it is difficult to define something that allows sufficient management control.

In reviewing the literature on various methods of allocating investment income to lines and within lines we found only two that would meet our criteria: a true investment year method and the Investment Generation Model Method. It was our feeling that our company size (roughly $300, 000, 000 in assets), the nature of the market, and the current volume of inforce business, does not warrant the precision of the true investment year method.

To confirm our feeling, we surveyed other companies in this market and found that none of them use as exact I.Y.M. Method.

The Investment Generation Model Method applied to a single line of business is similar to the Investment Year approach in that it identifies generations of assets. Each generation has different investment characteristics, and the funds making up each generation are identified as having been originally contributed by specific policies within a line. Since it is a model, the goal is to achieve a degree of equity similar to the Investment Year Method, but requiring less detailed record keeping.

The steps in the application of the method are to:

1. Set up the assets in model form and assign investment characteristics with respect to rate and maturity.

2. Calculate the interest credits for each generation.

3. Determine the declared rates for each generation of policyholders.

Obviously, the real work in this procedure is in the first step - setting up the assets in model form. I wish that I could tell you that we did this easily, but the truth is this method will be formally used for the first time at the end of 1979, and we are still working out the mechanics of the calculation. At this time, it is our intention to keep the model as simple as possible - probably 1 to 5 model "investments" for each generation of policyholders.

Among the problems that we know we must face, but about which no firm decisions have been made, are:

1. The handling of rollover of assets: This occurrence can easily be handled by the model by assuming a certain percentage of the assets in a generation are reinvested at the new money rate each year. The question is whether or not the added complications

to the formulas are justified by increased accuracy in the result, considering that management judgment will be exercised in determining the final rate.

2. The handling of surrenders: Will the effect of capital losses on surrenders be charged to the single generation that had the surrenders or spread over several generations. It may be desirable to spread such losses since each generation may not be large enough to have credible lapse experience.

3. The effect of Federal Income Tax: As you know, Federal Income Tax is different for qualified reserves, non-qualified reserves, and interest paid. Legal and Tax counsels are investigating how the company should treat this issue, but, in any event, it will need to be equitably reflected in the declared rates. This is, currently, only a minor problem, since we are a phase 2 negative company.

Once we have overcome all of these practical and theoretical problems dealing with determination of the credited rates and have decided on the rates for each generation of policyholders, we have only one more problem - properly calculating each policyholder's credited interest. Fortunately, we have a computer system that will do this work for us. The system is capable of maintaining a large number of "cells" for each contract. Each of these "cells" can have a different credited rate for any period of time. Therefore, we have total flexibility in determining our investment generation. As a practical matter, we will probably define a generation as a calendar year. The credited rate will be separately determined only for the last 10 years. All money older than 10 years will be lumped into one "generation".

We intend to provide each policyholder a status of his account each year. This status would inform him of the credited rate on all past payments into his annuity, and the rate that will be credited to new payments in the current year. In addition, we will calculate an average composite rate for his past payments. This allows our agents and policyholders to think of our system as a "two tier" method with one rate for past deposits and another rate for new deposits. In fact, each policyholder will have a different rate for his "past deposit" tier but this will be transparent to him.

The final area that I want to cover this morning is Investment Policy. As you can imagine, the entry into this market sparked some hectic discussion between the marketing, actuarial, and investment departments. Although all markets were discussed, the greatest unknown was the non-qualified single premium market. The discussion centered around two questions:

1. Was the level of investment risk in this market acceptable?
2. If so, what is the best investment policy for this market?

In order to answer these questions we contracted with a consulting firm to model the financial effect of various adverse interest rate scenarios, given a variety of lapse assumptions and investment policies. The conclusions of that study were as follows:

1. The investment risk is acceptable.
2. An investment policy heavily weighted towards a short and intermediate maturity distribution is markedly superior to mortgage or long maturity distributions. It evidenced a surprising ability to withstand extremely adverse experience in lapse ratios and/or interest rates.
3. Under the more likely cyclical interest rate conditions, there is little profit differentiation among the various investment policies tested.

This study has given us more comfort that this line of business is attractive for the future.

MR. DANIEL J. McCARTHY, Jr.: At this time I am going to offer some comments which are in the framework of a mutual company issuing participating life insurance and wishing to use, or thinking about using, in some fashion, a year of investment approach or - more accurately - a subdivision of its business into generations, in its ordinary dividend formula. Some of the considerations that are listed in the program raise important practical questions for a company that decides to take that route. I would like to toss out some ideas about them. I should say at the beginning that I view this as an area whose development has really just begun, and so I consider some of the things that I am about to say as rather tentative, as opposed to dogmatic.

The first question that we listed in the program, and perhaps the first one that a company in such a position has to consider, is a definition of the generations of its policyholders. There are a few companies, as you probably know, which use some sort of a generation method in their dividend formula. I don't believe that any of them, for life insurance, is actually treating each year's issues separately. Therefore, such a company must face the question of how to combine adjacent years' issues into a reasonable pattern of generations. We've done a little work in this area in a couple of situations, and exploration convinced us, first, that in going back into the past, it isn't necessary to go terribly far back, certainly not more than about ten or twelve years back, before you reach a point at which generational differences don't matter today. I wouldn't say that necessarily means that generational differences today won't matter twelve years from now. However, in terms of looking at blocks of existing business, doing some exploration and modeling, bringing funds forward with investment turnover and cash flow, we concluded that, at least under the conditions that have prevailed from issue until now, going back to the earliest 1958 CSO issues is certainly as far back as one would need to go in order to pick up all the distinctive differences that emerge among generations. There is one problem with that, to which I'll allude a little later, which affects very old blocks of business, but except for that, our tentative conclusion is that you don't have to go back terribly far into the past to impose some kind of reasoned equity on the situation. To me, there is a more significant problem going forward, because once you've decided that you are not necessarily going to treat each year's issues as a separate generation you have to confront, ideally before the fact rather than after, what will be regarded as a significant difference that will cause you to close off one generation and open another.

In our discussion about this yesterday, Tom Sutton pointed out that, in the extreme, if you allow larger and larger differences not to be significant, in the long run you will simply be back to a portfolio method again. If a company treats smaller and smaller differences as being significant, I think it is taking on real administrative problems, real problems of communications with its agents, and potentially significant replacement problems among its policyholders. So the difficulty is, perhaps, that as rates edge up, let us say, or edge down, there may be no distinct rule enabling a line to be drawn where one may say, "We'll have a different generation begin here".

Another approach to the definition of generations is to say, "Every time we bring out a major new product line or an entirely new rate book, we'll regard that as the beginning of a new generation". Of course, if a company steps on that road, then it seems to me that every time rates have, let us say, edged up, and there is a desire to look a little bit better, there would be a tendency to want to bring out such a product line in order to be able to set a dividing line and have a new generation. This is somewhat akin to the problems confronted by companies who issue certain kinds of guaranteed renewable health insurance business. Some of those companies have a tendency to close off old blocks of business when they believe that the loss ratio will begin to rise significantly, in order that those blocks of business can be regarded as separate policy series for purposes of rate increases. Then a new policy series is begun which has better experience, at least at the outset.

I think that companies stepping in the direction of an investment generation approach in their dividend formulas have a similar kind of question to face. To me, this is a question that requires a great deal more thought, because there are no very clear answers at the moment.

The second question on which I would like to focus is the effect of policy loans. There are already, as is well known, some companies which do not use an investment generation method in their dividend formulas, but which do distinguish generations to the extent of differing percentages of policy loans (and the different interest rates of those loans) among the assets backing a generation of policies. This goes back some time in several companies and, in fact, this is fairly clear in the rates that they set forth in their Schedules M. It is more complicated now, of course, because of substantially different policy loan interest rates from state to state.

I suppose a company really has several choices.

1. It can continue, as fewer and fewer companies are doing, to use

a global approach to policy loans or an approach which differs only according to the policy loan interest rate.

2. It's possible, once generations are defined, to keep track of the actual block of policy loans, both assets and income, according to each one of those generations and thus reflect the effect of policy loans exactly in determining the rate to be applicable to that generation. I think this is a particular problem for a company, which does not have a separate product line for pension trust business. It has appeared to us in some work we've done, and seems corroborated in other places, that there is a considerably different policy loan propensity in pension and non-pension business. If there is not a separate generation for pension business, even perhaps running side by side with another generation for non-pension business, I think there is a significant equity problem in the treatment of policy loans between pension and non-pension series. Obviously, a way to overcome all of that, although a way which may have some practical and legal difficulties ahead of it, is to recognize policy loans at the policyholder level. I think all we can say on that point is that there are several choices available. These choices differ widely both in their practical impact and in their theoretical effect on the determination of earned rates

The next point I want to make about the determination of the earned rate for each generation is that, particularly for older generations, it matters considerably whether or not the surplus earned by a generation is left in that generation's fund and allowed to accrue to the benefit of that generation when determining the earned rate. Let me give you an example. As a generation gets older, it will typically happen that its insurance cash flow, that is, premiums minus claims minus expenses, becomes negative. On the other hand, its investment cash flow, that is, the combination of investment income and investment turnover, will be positive. Suppose there is a generation which has long since repaid its acquisition costs and which now, on a historical fund accounting basis, is in a surplus position. You can see this most dramatically if you have a company which has been issuing business for a long time and, if you you look at, for example, the fund account for its American Experience business, which typically is spectacularly in the black by this time. Because there is a mixture of negative cash flow from insurance operations and positive cash flow from investment operations, the earned rate that one determines for that generation will vary considerably, and I stress the word "considerably", depending upon whether or not one attributes to that generation only an amount of assets equal to its reserves or, on the other hand, an amount of assets equal to its reserves plus the surplus generated by that generation.

The difference grows rather quickly. For example, I constructed a numerical illustration using a hypothetical old block of business with a historical rate of return of 6% and a new money rate of return of 9%. Depending upon whether the surplus is left in the block or not, the earned rates developed, going forward, for that block will differ by 8 to 10 basis points in the first year and widen for a good many years by about that many additional basis points a year. Thus, there can well be a situation in which, in about 5 to 6 years, there is as much as 50 basis points difference in the earned rate developed for an old generation depending upon whether or not one leaves its surplus funds with it.

Exactly the reverse problem occurs for a new generation whose funds are considerably less than its reserves in the early years. Now in the new generation, of course, there is positive insurance cash flow after year 1 and, initially, rather small investment cash flow, so the effect is not as dramatic in the new series as in an old series. But, as the series ages and as the amount of its assets becomes increasingly large relative to the amount of its year to year to year cash flow, the same problem arises. This, particularly for a mutual company, is as much a theoretical problem as a practical one. We always say that it's the older policyholders who are putting forth funds to enable the company to write the new generation which will then, ultimately, repay those funds. To me the key question then becomes, "At what rate of interest does it repay those funds?". Does the new generation borrow money from the old generation at the portfolio rate applicable to that old generation, or does it borrow money from the old generation at the rate which could otherwise be earned today on the newly invested cash flow of that old generation. It is a theoretical difference, but it has important practical implications as rates of return are developed for use in the dividend formulas.

The next aspect which I think has to be addressed is the question of federal income tax charges. This questions arises in two ways; it arises, in one instance, between generations with a lower rate of return and generations with a higher rate of return and, in a separate instance, between pension business and non-pension business. It seems to me that a consistent use of an investment generation method by a company which is taxed on taxable investment income will do two things:

1. Taking non-pension business first: The difference is earned rate among the various generations will be sharply narrowed if the federal income tax charge applicable to each generation is consistent with the earnings pattern of that generation, as opposed to a company-wide average tax charge. For example, consider a company (or its ordinary line of business) for which the Exhibit 2 rate for the total line is 7%, and suppose that that is made up of two equal components, one of which has an Exhibit 2 rate of 6%, and the other of which has an Exhibit 2 rate of 8%. Under a specific set of assumptions, the tax charge for that line, as a whole, works out to about 130 basis points. However, if one treats each line of business separately and calculates the tax charge applicable to each, the one with the higher rate of return generates a tax charge of about 175 basis points; the one with the lower rate of return generates a tax charge of only about 90 basis points. So, of the 200 basis point difference in pre-tax rate of return, something like 85 of those basis points immediately get chewed up in the tax difference, if federal income taxes are reflected accordingly to the investment earnings characteristics of each subline of business. The significant questions are, first, whether that should be done and, second, whether or not companies are actually doing it. My own feeling is that if you allow investment results to adhere to different sublines of business to different extents based on their investment characteristics, the federal income tax charge ought to flow logically along.

2. Turning, now, to distinctions between pension and non-pension business: For new business, the federal income tax differential between pension and non-pension business widens dramatically if the tax characteristics of each generation are used to determine how investment rates are actually applied to that generation. To return to the example which I gave before, for the total company model I used, the differential in after-tax rate between pension and non-pension business worked out to about 100 basis points. For the line with the high current rate of return, my 8% line, that after-tax differential worked

out to about 150 basis points, and, for the line with the low rate of return, it worked out to only about 70 basis points. It seems to me that if companies using the investment year method or using an investment generation method in their dividend formulas are reflecting tax differentials between pension and non-pension business in a manner consistent with their allocation of investment income, we would see, on new generations, very wide differentials between the rate of return used in the dividend formula for pension business and that for non-pension business. I don't know what experience others of you have had, but I have not seen, in practice, differentials as wide as those which seem theoretically to emerge from an analysis such as the above.

In the above illustrations, I allocated the federal income tax charge among generations on a "separate company" basis, for ease of explanation. The problems in practice with a "separate company" allocation approach are several. Two principal difficulties are the lack of uniqueness of definition of what "separate company" means and, more significantly, the fact that the sum of the taxes calculated for various components of a company's total business using the "separate company" method do not equal the company's total tax. Allocation using company-wide marginal tax rates is a desirable alternative, especially for companies taxed on taxable investment income. It provides a consistent method of allocation which, in addition, produces tax charges for each component which add to the total tax charge for the company. In actual usage for the analysis of a life insurance company's financial results (and the establishment of a dividend philosophy) based on an investment generation method, it produced consistent results and avoided significant anomalies which could have arisen under other methods.

The last item that I want to comment on in this regard has to do with the practical aspects once you've been through the exercise of determining how you are going to determine the rates and how you are going to reflect the various factors: the practical aspect of applying these rates in the dividend formula, taking into account in particular the very substantial expenses involved for a large company of retooling all aspects of its dividend formula over many generations every year. We've done some experimentation in this regard and concluded that although, in theory, the dividend formula is retrospective (that is to say a three factor formula is expected to show the contribution actually made by investment results, mortality results, and expense results in the recent past), in practice it seems feasible for purposes of continuity, using some modeling, to project those results to the near term future, particularly for older generations, and thus arrive at a rate of return which is an amalgam of that which has emerged in the near term past and that which one expects to emerge in the near term future. By near term I mean, perhaps, a five year corridor centering on the present, two years on either side, so that one is not compelled to go far into the future and estimate what rates of return are going to be. It seems to me that a company which is maintaining a number of generations, and which, as a practical matter from the point of view of expense, doesn't wish to have to retool all of its different dividend formulas that emerge every year, has to begin giving some consideration to doing some averaging and some projecting, at least into the short term future and at least for existing blocks of business, in order both to have dividend stability and to avoid the expense of constantly redoing the dividend formula for each one of these blocks. In a sense, this a departure, because we think of dividends as being retrospective. However, I think that some short term projecting doesn't interfere substantially with that concept and makes it more practical for a company to use from the point of view of its actual administration.

MR. THOMAS C. SUTTON: The program indicates that we will not discuss whether Investment Year Method within the Ordinary lines is appropriate, or for that matter legal or desirable. With the elimination of those constraints which normally surround our business life, we should be able to exhibit some unbridled imagination. But, for the sake of perspective, I would like to emphasize that there are a number of problems associated with the use of Investment Year Method for individual, participating business. One of those problems is "How to do it" .... and that is the one we are going to discuss today. Solving the "How to do it" problem does not necessarily mean that the other problems will go away.

My comments on "How to do it" are centered around the concept of the Adjusted Asset Base Method for allocating investment income. I did write a paper on that subject which appeared in the Transactions. I must say, though, that I have always been very impressed by the erudite nature of our professional publication, so in writing the paper I included a large number of integrals and Greek letters in order to make the concept suitably incomprehensible. Unfortunately, I think I succeeded. Today, I would like to ignore the theory and describe how to apply the method The description will require looking at a few basic relationships in symbolic form which are on the handouts.

At the top of the first page is a time line covering two intervals, usually "years" for convenience. Let's say for the moment that these two years are past and that the symbols represent funds for a line of business or even an entire company. "A" is the Adjusted Asset Base at the beginning of Year 1, and temporarily let's accept that it is an undefined quantity. "B" is the book value of the assets at the beginning of Year 1; "N" is the net new cash flow, excluding investment income and rollover of previously invested funds; capital I is investment income and small i is the rate of interest applicable to new funds, that is, the new money rate. Primed symbols apply to Year 2.

Now, Equation (1) says that investment income equals the new money rate times the (time weighed) new "outside" money coming in plus the new money rate times the Adjusted Asset Base at the beginning of the year. This relationship really defines the concept of Adjusted Asset Base.

Clearly since N, I and i are all known, you can determine the numerical value of A from this equation. Similarly, in Year 2, Equation (2) holds true. Equation (3) merely states the obvious, that the increase in book value for the period equals net new outside money plus investment income.

Now the question to be posed is "How is the Adjusted Asset Base in one year related to the Adjusted Asset Base in the next?" Intuitively you can answer that in two steps. First, let's assume that there is no rollover, ever, of invested funds. That means that the annualized amount of interest earned by previously invested funds will never change. In Year 1 we had "A", "N" and capital "I" all invested at rate small "i". So if "A'" is defined by Equation (4), it is clear that small i' times A' will equal the annualized amount of interest on all prior investments. So with no rollover, Equation (4) defines the relation between one year's Adjusted Asset Base and the next year's.

Suppose now that there is no change in interest rates for many years, but that there is rollover. Then eventually the entire book value of assets would be earning interest at the new money rate. So the Adjusted Asset Base must get closer and closer in size to the book value. This is what Equation (5) says, assuming Y is a positive quantity between 0 and 1. If Y is zero, then the gap between the Adjusted Asset Base and the book value will never close .... this corresponds to no rollover. If Y is 1 then the gap closes immediately .... this corresponds with 100% rollover.

Putting Equations (4) and (5) together gives Equation (6) which describes a "complete" relation between the Adjusted Asset Base in one year and the next. Note that "Y" is similar to but not exactly the same as a portfolio average rollover rate. In equation (6) we know A and A' from the first two equations, and of course B, i and i' are also known. So, that equation may be used to determine "Y".

Finally, if we know Y, we can use Equation (7) to update the Adjusted Asset Base of any segment or portion of the total fund and then with Equation (8) determine the interest to be allocated to that segment or portion.

This interest allocation method is controllable, in that it can be used to allocate a specific amount of investment income; and it does so in a manner which recognizes the incidence of past new money contributions under each segment, the new money rates corresponding to those new money contributions and the subsequent rollover of those initial investments. This is not to say that the results are the same as the traditional Investment Year Method .... they are not, but they are similar, probably as similar as the results one gets by other simplified methods.

Consider applying this approach within the Ordinary Annuity Subline. Each policy record could include the value of its Adjusted Asset Base and interest could be allocated to each contract annually using Equations (7) and (8). Going a step farther, it is possible to estimate i' and Y at the beginning of Year 2 based on past history and economic trends. Then the Adjusted Asset Base for Year 2 can be computed at the end of Year 1, and thus pro rata interest at any point during the second year may be computed by Equation (8). If your estimate was off, you can take that into account in making your estimate in the following year.

With these relationships in mind, it is fairly easy to apply them to individual permanent life insurance policies on a seriatim basis. The second page of the handout does this. In the time line diagram, the policy reserve has replaced the book value of the fund and several cash flow components have replaced N, the net new cash flow. These cash flow elements are: Gross premium less expense, placed at the beginning of the year; and the cost of insurance plus dividend placed at the end of the year. The "year" being used is a policy year, so that the necessary values of Y, i and i' are obtained by projection and estimation, rather than by after the fact precise calculations.

The form of the dividend in Equation (3) can readily be derived in the normal fashion with the aid of the line diagram and the Adjusted Asset Base relationship. The dividend formula is the usual three factor form except that the interest element incorporates the Adjusted Asset Base to determine allocated interest from which is subtracted required interest at the valuation rate.

In allocating interest on a portfolio basis, ignoring policy loans and Federal Income Taxes. one interest rate is commonly used to apply to all policies

This provides a uniformity of approach which has the appearance of equitable treatment, and the substance also in the opinion of most actuaries. The analagous advantage of the Adjusted Asset Base method is the same uniformity of approach with the one interest rate augmented by one quasi-rollover rate which are used jointly to determine the allocated interest share of each policy.

Of course, the method can be applied to groups of contracts, such as those issued in a common year, or those under a common valuation standard and interest rate. One average interest rate for the group can then be determined and used to allocate interest within the group.

If the seriatim approach is used to allocate interest by policy, the logical approach to policy loan interest is to do the same. The methods for accomplishing this have been developed elsewhere, so I won't dwell on them here. But the essence of the method is to consider the policy reserve as consisting of two parts, one equal to funds actually loaned, and the other consisting of the balance which is assumed to be invested in "normal" investment. Interest allocations for dividend purposes are then determined separately for each part and added together to obtain the total allocation.

To illustrate a possible method, I'll assume that the taxable income is that of most mutual companies .... essentially the excess of investment income over required interest. Again following a seriatim approach, after allocating investment income as described above, it is quite straightforward to compute the effective interest rate relative to book assets or reserves and to use that rate as the average earnings rate in applying the Menge rule, and computing a Federal Income Tax amount.

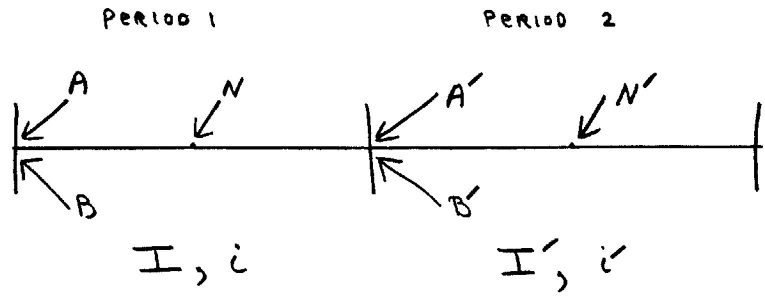
The obvious question is how the sum of all these seriatim charges would compare with the charge computed in aggregate, since it is the latter that is the basis for actual Federal Income Tax. I think that it is fairly easy to demonstrate mathematically that the seriatim approach will generate greater aggregate tax charges .... and that under current conditions the size of the extra charge is equivalent to between 10 and 20 basis points of interest. Since that is often the general size of contributions to investment contingency reserves, one might conclude that such contributions were adequately dealt with by this margin generated by the Federal Income Tax calculation method.

For tax favored business, or pension reserve business, the approach described would result in no tax assessment. It may be desirable in that case to require a minimum charge for Federal Income Tax on qualified business designed in aggregate to cover the estimated tax on that segment of the business.

The difference between the Adjusted Asset Base and the book value or reserve is a measure of the degree of potential for capital gains or losses. If the two are equal, then all monies under the contract are invested at current rates, and if they are withdrawn no capital gain or loss occurs. If the Adjusted Asset Base is less than the reserve, then monies under the contract on average were invested at lower rates than currently available and thus there will be capital losses upon withdrawal. This fact could be used in one or both of two ways. First, a capital gains risk charge could be assessed on all business as a fraction of the difference between the Adjusted Asset Base and reserve. This could be an additional element of the dividend. Second, such difference could be used at the time of surrender to adjust any termination dividend available.

The method that I have described seems to have a number of advantages which I hope I've made apparent. It can be used in any context, including the three listed in the program: permanent life insurance policies, flexible premium annuities and term life insurance policies with supplementary accumulation funds. It makes it unnecessary to specify particular generations of policy owners. It can be modified to take account of policy loans, Federal Income Tax and capital gain and loss.

Adjusted Asset Base — General



A = Adjusted Asset Base B = Book Value of Assets

N = Net new cash flow, excluding investment income & Rollover

I = Investment Income i = New Money Interest Rate

(1) $(A + \tfrac{1}{2}N)\, i = I$ (2) $(A' + \tfrac{1}{2}N')\, i' = I'$

(3) $B' - B = \Delta B = N + I$

(4) $A' = (A + N + I)\,\dfrac{i}{i'}$ No Rollover

(5) $A' = B' + (A - B)(1 - y)$ No change in interest rate

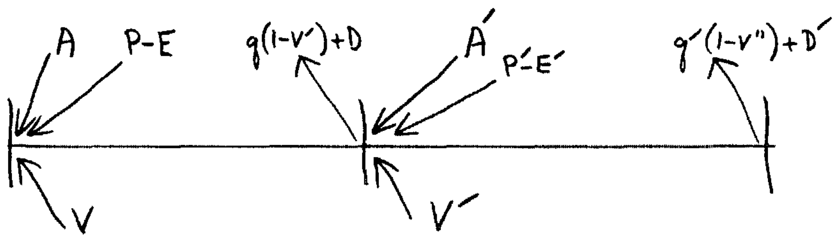
(6) $A' = (A + \Delta B)\,\dfrac{i}{i'} - y\,(A - B)$ Complete

(7) $A'_k = (A_k + \Delta B_k)\,\dfrac{i}{i'} - y\,(A_k - B_k)$

(8) $I'_k = i'\,(A'_k + \tfrac{1}{2}N'_k)$

Adjusted Asset Base – Life Insurance

ONE POLICY YEAR NEXT POLICY YEAR



V = Terminal Reserve of Prior Year
P = Gross Premium
E = Expenses
q = Dividend Mortality Rate
q^R = Valuation Mortality Rate
D = Dividend
i^R = Valuation Interest Rate
NP = Net Premium

$$(1)\quad A' = (A + \Delta V)\frac{i}{i'} - Y\,(A - V)$$

$$(2)\quad I' = i'\,(A' + P' - E')$$

$$(3)\quad D = i\,(A + NP) - i^R\,(V + NP) + (q^R - q)\,(1 - V') + (1+i)\,(P - NP - E)$$