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**DIGEST OF DISCUSSION OF SUBJECTS
OF GENERAL INTEREST**

Methods of Allocating Investment Income

- A. What investment-year allocation methods are in general use? How are the following items treated: (1) interest on policy loans; (2) realized and unrealized capital gains and losses; (3) income on refinanced investments; (4) income from real estate; (5) uninvested funds; (6) short-term investments; and (7) any other items given special treatment?
- B. To what extent is the investment-year method applicable through dividend treatment or otherwise to (1) individual life insurance; (2) individual annuities; (3) supplementary contracts; (4) group annuities; and (5) group insurance?
- C. How does the investment-year method affect allocation of such items as investment expense, federal income tax, and mandatory security valuation reserve?

Treatment of Unrealized Capital Gains

To what extent is it appropriate to reflect unrealized capital gains (or losses), including such items as real estate appreciation (or depreciation) in dividend or financial experience for various lines of business? What principles are employed in the accounting for investment returns and capital gains or losses on such investments as common stocks and real estate in order to achieve substantial equity among successive generations of policyholders?

New York Regional Meeting

CHAIRMAN JACK T. KVERNLAND: Actuarial science had its beginning with the scientific organization of the mortality table. Over the years much time has been given to the mortality as well as the expense elements of the premium structure, but surprisingly little attention has been focused on the investment element that has such an important bearing on the cost of our product. However, with the rise in the interest rate and with competitive pressures, particularly in our group annuity business, there has been much more attention given to the investment element in very recent years. It is the investment aspects that we want to talk about here this morning.

The members of the panel—Joseph B. Crimmins, senior vice-president and actuary of the Metropolitan Life Insurance Company; Howard H. Hennington, vice-president of the Equitable Life Assurance Society; and Preston C. Bassett, vice-president and actuary of Towers, Perrin, Forster and Crosby, Inc.—will lead off the discussion of the topics.

MR. HOWARD H. HENNINGTON: The investment-year method of allocating investment income has been vital in the growth and retention of group annuity business. It is vital because of the ever present alternative available to the contract-holder to put his funds instead into a trust for investment. The group annuity contract results for current payments must always be competitive with the current prevailing investment rates. Similar considerations of alternative investments also create a strong reason for using the investment-year principle in setting nonparticipating immediate annuity rates.

The investment-year method was a natural refinement of the previous common method of using a uniform rate of interest to allocate investment income. Both are methods of allocating interest, dividend returns, and certain capital gains and losses, but there is no attempt to recognize all market value changes. Some actuaries have wistfully recognized that there is much merit in a method of allocating all investment income, including all market value changes. The main advantage of a market value approach is that it puts all funds on a common base, regardless of when received, and it automatically produces a much better cash-withdrawal value.

Since there are too many departures from regular annual statement procedures and difficulties in establishing market values, a market value approach is probably not yet feasible. It is my private prediction that we will see companies gradually adopting practices that come closer to a market value approach. There is a great impetus in this direction when we design contracts, such as those for large H.R. 10 association cases, where it is important to keep records of accumulations of payments with respect to individual participants. There has already been some research in the area of adopting approximations to market value using adjustments based on the rate of return applicable to existing funds and the rate of return applicable to new investments. Another stimulus for this approach comes from the use of market values in handling common stock investments in separate accounts for qualified pension plans.

Mr. Gubar, one of my associates at Equitable, has compiled information on the practices of about a dozen large companies with regard to the investment-year method. He is struck by the variety of methods among the companies surveyed. I will try to give you a quick sketch of his findings for these companies.

Most of the companies adopted the investment-year method on a prospective basis, distinguishing only those investment years or periods that followed the adoption of the method. Two companies chose retro-

spective methods, one recognizing investment years five years back and one going back twenty-five years. Most of the companies distinguish investment generations for each calendar year, but two intend to keep the investment period open so long as the new-money rate has not changed significantly.

Another point of variation in years after the first is whether the investment generation is reduced by subsequent turnover of investments—a declining index system—or the generation is fixed with the rate of return adjusted to reflect investment turnover—a fixed index system. This is important in comparing the investment rates of two companies. Most of the companies surveyed use a declining index system.

Most companies allocate policy loan investments to that line of business which gave rise to the policy loans. Capital gains and losses are usually handled in the same way as the basic income was handled, except that in some instances unrealized gains and losses may not be allocated within the line for group annuity dividend purposes. Income or refinanced investments is sometimes handled by a special adjustment, so that only the increase in amount of investment affects the current generation at the effective rate of interest on the new-money portion.

Income from certain investments, such as real estate, uninvested funds, and short-term investments, is usually handled on an aggregate basis spread over all generations. However, some companies distinguish “investment real estate” and classify such investments by investment year.

The allocation of common stock investment income for annual statement and dividend purposes presents some very difficult problems of equity. These problems are solved in separate accounts because assets and liabilities are determined with recognition of market value changes. In the general account, if the allocation does not include capital gains and losses, the over-all returns are temporarily depressed, since the rate of return for common stocks under present conditions is considerably lower than the rate for other assets. If a company is building up a common stock investment in the general account, the proportion of common stocks is larger in the recent investment years than in the total portfolio and the temporary depression of the yield in these years is magnified. This situation has caused some companies, especially in their group annuity line of business, to use an aggregate approach for the allocation of common stock returns.

The problem is still present, but it is minimized rather than magnified. I have not seen any satisfactory solution to this problem short of using a market value basis for the allocation of investment income. In that event there would probably be needed some means of spreading the effect of

the common stocks so that extreme fluctuations in dividend results would be prevented. This is another reason why I feel that companies will ultimately come closer to a market value approach to investment income allocation in the group annuity line of business.

MR. JOSEPH B. CRIMMINS: The Metropolitan's method of investment income allocation is a little different from the usual method.

Departmental accounts are maintained to show separately all income and disbursement transactions for each department. Separate departmental accounts are maintained for industrial, ordinary, group life, group annuities, group health, and personal health business. The accounting system also shows a separation for each department between business written in United States currency and business written in Canadian currency. Investment contribution balances are maintained departmentally, representing for each department the aggregate of income over disbursements to date, excluding policy loans. The mean investment contribution balance over each calendar year for a particular department would represent the amount made available for general investment during that year through the operations of that department.

These investment contribution balances were the basis for allocating investment income on the uniform system which was in effect prior to January 1, 1964. With certain adjustments, they are used for allocating investment income under what we call the "investment period method," adopted January 1, 1964.

Under the investment period method, all assets, and the income associated with these assets, were classified initially into three major categories:

Class A assets includes cash, short-term investments, government bonds, stocks, and real estate. Investment income arising from these assets is allocated departmentally according to mean investment contribution balances.

Class B assets includes long-term bond and mortgage loans on hand December 31, 1963. Investment income arising from these assets is allocated on the investment contribution balances as they existed on December 31, 1963.

Class C assets includes long-term bond and mortgage loans acquired on and after January 1, 1964. Investment income arising from these assets is allocated on a series of net investment contribution balances obtained by taking total investment contribution balances and deducting therefrom amounts representing the departmental allocation of Class A and remaining Class B assets.

This system can be extended very readily to recognize new investment periods when some significant change takes place in the level of interest rates. Commencing January 1, 1967, all long-term bond and mortgage

loans acquired on and after that date will be separately classified as Class D assets. We do not intend, at present, to extend the allocation system so as to reflect in separate categories the investment yields attributable to long-term bond and mortgage loans made in each calendar year. We do not rule that out as an ultimate possibility, but we feel that this would be an expensive refinement, unnecessarily complex and not essential to equity at the present time.

The items specifically mentioned in the question are handled as follows:

1. *Interest on policy loans.*—Policy loan interest is credited directly to the originating department.

2. *Realized and unrealized capital gains and losses.*—Realized capital gains and losses are allocated on the same basis as the investment income on the class of assets from which the gain or loss arose.

Unrealized capital gains and losses are allocated on the same basis as realized capital gains and losses.

3. *Income on refinanced investments.*—Up to the present, we have not found it necessary to make special adjustments, and the entire refinanced investment is reclassified into the latest investment period.

4. *Income from real estate.*—All real estate investments are categorized as Class A assets, and real estate investment income is allocated uniformly on the basis of total investment contribution balances.

5. *Uninvested funds.*—These are included in Class A assets.

6. *Short-term investments.*—These are also included in Class A assets.

7. *Other items given special treatment.*—Stocks and government bonds are also presently included in Class A assets, and investment income therefrom is uniformly allocated on the basis of total investment contribution balances.

Within departments we use the investment period method at present only for group annuity contracts and group retirement income policies issued in connection with qualified pension plans. We also recognize the interest yields obtainable on new investments in determining the rates of stipulated payments for nonparticipating individual immediate annuities purchased by single stipulated payment.

The method of application within the group annuity department is presently based on the same principles as the departmental allocation, except that investment income rates are adopted for each investment period and applied to the respective portions of the amounts made available for investment through the operations of each contract as shown by an internal record of financial experience that is maintained on each contract for dividend purposes.

We do not allocate general investment expense and taxes by investment period. We feel that, in view of the size and stability of our investment portfolio, it is unnecessary to introduce costly refinements into the alloca-

tion of investment expense and taxes which would have little significant effect on the net investment income.

The allocation of federal income tax departmentally is not affected by the investment period method nor is the allocation of the mandatory security valuation reserve.

Under Metropolitan's present system of investment income allocation, all common stocks are included in Class A assets, and both dividends and realized capital gains and losses are distributed uniformly by department on total mean investment contribution balances. Unrealized capital gains and losses are not journalized and are allocated departmentally on the same basis as realized capital gains and losses.

For dividend purposes on group annuities, realized capital gains and losses are included in the group annuity interest factor but on a basis that reflects averaging over a period of years. Unrealized capital gains and losses are netted into the departmental allocation of the mandatory security valuation reserve and are similarly treated in the dividend formula.

This practice may require reconsideration if the volume of common stock investments becomes relatively large and if the unrealized capital gains or losses become significant. Possibly, it may then be desirable to assign common stock purchases to the current investment period. A more urgent problem may be the necessity to bring some part of the unrealized capital gains or losses into the dividend formula interest factor, possibly on some averaging basis along the lines now being discussed for pension plan funding. For the present, however, the problem is not urgent as far as we are concerned.

Real estate investments present somewhat similar problems. Because of the size, infrequency, and permanence of our real estate investments, we felt it more appropriate to assign these investments to Class A assets also where the net investment income and realized capital gains and losses are distributable uniformly in the departmental allocation. With real estate, as with common stocks, significant differences may develop over a period of years between the market value of a particular investment and the value after depreciation and other write-downs at which the investment is carried on the company's books.

As in the case of common stock investments, it may become desirable to make some adjustments in our dividend distribution that would recognize the differences between market values of real estate and depreciated cost values. This is not an urgent problem for us at the present time. A related problem concerns the annual statement—perhaps, for asset purposes, companies should be allowed to report real estate at the

market values used for federal income tax reports. A portion of the increase in value could be considered income after providing for any probable taxes on capital gains.

MR. CARROLL H. BROWN: The investment-year method that the Massachusetts Mutual uses for allocating net investment income is one whereby a set of investment-year net rates is applied to a set of funds. The investment periods used in a set consist of each year after 1955 with all years prior to 1956 combined. The total funds used for all lines combined for a given investment period are approximately equal to the increase for that period in the ledger asset values of the items included in asset item 10A of the annual statement, EDP equipment, and due and accrued interest. The funds used for each line for a given investment period are determined by that line's contribution to the total for all lines combined. Any funds assigned to a given investment year remain assigned to that year, and any subsequent reinvestment of those funds is reflected in the rate applied to them. Each investment-year net rate in a set of such rates is based on the weighted average of the gross yields currently being realized on funds assigned to that investment year less an adjustment for investment expenses. The weighting is based upon the portions of the funds which were reinvested in years subsequent to that investment year. The same set of investment-year rates is used in determining each line's allocation of investment income.

We have been using the same investment-year method since 1960, with a major revision in 1962 at the time it was approved by New York, and with several minor revisions since then. For example, prior to 1966 we had been determining each select investment-year rate based on the weighted average of the yields at which the investments had originally been made rather than based on the weighted average of the yields currently being realized. Also, the amount of income allocated to the ultimate period was being determined as the balancing amount which, together with the amounts allocated to the select periods, gave the correct total rather than being determined in the same way as it was for the select periods. This earlier method produced satisfactory results while there were only a few select periods involved, but with each additional year there was additional error added to the balancing income of the ultimate period. Consequently, in 1966 we did change our method of determining investment-year rates so as to more accurately reproduce the actual dollars of investment income being realized in each investment period.

One feature of our method which we find advantageous is that the same rates used for allocating investment income between lines can be

directly used, with suitable adjustment for such items as taxes and expenses, for allocating interest to our individual experience group annuity and group permanent fund accounts. The investment-year rates are used as effective rates and have been adjusted to reflect the fact that on most of our investments we receive interest more frequently than annually.

Under our allocation method certain items are treated as follows:

1. Policy loan interest is allocated directly to the ordinary life insurance line.
2. Realized capital gains and losses are allocated by an investment-year method similar to that used for our investment income, that is, a set of net capital gains rates is applied to the same set of funds as used in the income allocation. Unrealized capital gains and losses do not affect our investment income allocation and are not being allocated by an investment-year method.
3. Income on a refinanced investment is treated as income on a new investment. While I think that it would be more equitable to split a refinanced investment into the old and new portions, at the present time it would be quite inconvenient for us to do so.
4. The funds and any income from home-office real estate, real estate under construction, uninvested funds, short-term investments purchased to mature in one year or less, and EDP equipment are all allocated to the various investment periods in proportion to the total funds allocated to each of those periods.
5. The ordinary life insurance and supplementary contract lines are first combined and treated as a single line, and the resultant investment-year income allocation is then split in proportion to the total funds of each of the two lines.

With regard to Question B, our investment-year method is applicable within lines of business only to the extent of the interest to be credited each year to (1) the individual experience fund accounts of the group annuities line, (2) the individual experience group permanent fund accounts of the group life insurance line, and (3) the individual experience accounts for deposit funds left with the company for the purpose of increasing the income available on certain pension trust policies of the ordinary life insurance line.

With regard to Question C, we allocate policy loan expenses directly to the ordinary life insurance line, and all other investment expenses are allocated to the various investment-year periods in proportion to the total funds allocated to those periods. Since the expense allocation is made in proportion to the funds rather than to the income from those funds, the investment-year method has little effect upon the allocation.

Our investment-year method does affect our federal income tax allocation, since we in effect do a separate Phase I allocation for each line, basing the taxable investment income upon the net investment income resulting from the investment-year allocation.

We do not make any allocation by line of our mandatory security valuation reserve.

MR. CHARLES B. BAUGHMAN: My comments deal with an investment-year allocation method which, as far as I know, is used only by companies writing variable annuities; however, I believe that this method can be used to great advantage by companies writing fixed dollar participating and experience-rated business. This method is not only relatively simple in its operation, but it also provides almost complete equity.

The method consists of the purchase of accumulation units by net premiums or contributions and the sale of accumulation units for disbursements. The accumulation unit value fully reflects the investment experience, including investment income and both realized and unrealized capital gains and losses, on whatever portfolio of the insurance company's investments which the company construes to be representative of the experience fund of the particular type of business being experience-rated.

Each asset is valued at market or by appraisal, whichever is appropriate, and the date of each valuation of assets coincides with the date of determining a new value for the accumulation unit. The valuation period can be whatever length the company prefers, but, if it is longer than a month, appropriate adjustments would have to be made for contributions and disbursements during the period because they are deemed to occur at the end of the period for valuation purposes.

It should be noted that the investment-year method and the accumulation unit method are different in philosophy, in that money deposited in a particular year shares in the investment performance of investments deposited in all subsequent years, and many prior years as well, under the accumulation unit method but not necessarily so under the investment-year method. This does not imply any loss of equity because, in effect, whenever a contribution is made it purchases a pro rata share of all investments in the portfolio and the purchase is made at the then prevailing market price, which is comparable to the prices which would be paid on new investments of similar types.

Another difference is that unrealized gains and losses are automatically reflected when incurred with the accumulation unit method. In a period of rapidly rising interest rates this could actually lead to a negative return on investments due to the decline in bond prices. Of course, this would not necessitate that the dividends reflect the negative return. Experience interest rates can be smoothed in the same way as with other methods. The purpose of the accumulation unit method is not to allocate current experience automatically in an equitable manner to the various experience funds.

As a matter of fact, it is likely that the company would find even less pressure for frequent changes in dividend scales, because all differences between actual experience and assumptions for dividend purposes auto-

matically accrue in the experience fund for ultimate distribution through later changes in dividend scales or by termination dividends.

In calculating the unit values, the company likely would not use the same assets for all lines of business; for example, it might wish to exclude policy loans from consideration for annuities, and it may wish to exclude all or a portion of common stocks for ordinary life.

If the company wishes, it can keep track of the number of units outstanding on each policy group. This gives another check on all calculations, since the total units outstanding must equal the sum of the units on all policies. Another possibility is to ignore the units on a per-policy basis but to use the difference in the quotient of successive accumulation unit values and unity as the experience interest rate for the period.

Disbursements for dividends and credits could either be paid in accumulation units or be handled as any other disbursement. Included in the disbursement item could be either actual benefits or graduated experience benefits, whichever suits the company's purposes.

I personally have not had experience with the traditional investment-year methods, but I imagine that there is quite a lot of administrative work involved in keeping track of each particular investment's experience and allocating this experience on a yearly basis to the appropriate accounts. I can also appreciate the problems of handling capital gains and losses, income and depreciation on real estate, and reinvestments. Furthermore, although equity among policyholders is substantially improved by the investment-year method, it still falls far short of the ideal, and the more one strives for more equity, the more expensive it becomes. I believe that the accumulation unit approach would both reduce administrative costs and increase equity.

MR. JOHN C. FRASER: I would like to describe the investment-year allocation method used by the New York Life.

Our investment-year method was instituted in 1963 and is a prospective method, that is, the investment-year classifications are investment years 1962 and prior and then individual investment years thereafter.

Our funds balance precisely to the sum of lines 10A and 19 of the asset page. Our funds are first subdivided into three categories of assets. The first of these we call "direct" assets, since they are subdivided precisely by investment year on the basis of an analysis. These assets consist of long-term bonds, preferred stocks, common stocks, mortgage loans, and mineral interests. The second category of assets we refer to as "allocable" assets, since they are not analyzed by investment year but are distributed in proportion to the investment-year subdivision of direct assets. Allocable assets consist of short-term bonds, FHA bonds, all real estate, cash,

and other miscellaneous assets. The third class of asset is policy loans, which are allocated directly to the ordinary life insurance line without an investment-year breakdown.

Having completed our breakdown of assets by investment year, we then subdivide each investment year by major line of business on a precise basis. In the case of investment years prior to the current investment year, the data are distributed pro rata according to the previous calendar-year breakdown. The line of business subdivision of the current investment year is based on an analysis of the flow of funds, and provision is made for the monthly incidence of such funds.

Our breakdown by secondary lines within major lines is done on the basis of mean liabilities.

All capital gains and losses, realized and unrealized, are distributed in precisely the same manner as investment income. When an investment is refinanced, the old portion of the investment remains in the old investment year but at the original rate of interest.

Within lines of business the New York Life uses the investment-year method only with respect to group annuities, certain special group insurance funds, and in determining premium rates for our individual single-premium immediate annuities.

Investment expenses are allocated by investment year in proportion to mean funds within a class of investment. Thus, we are reflecting the investment "mix" but are assuming that for a given class of investment the expense rate is invariant by investment year. It would be possible, of course, to make an expense analysis and separate acquisition, disposition, and maintenance expenses, but one would then have to turn around and amortize such expenses over the expected lifetime of the investment. It seems fairly clear that the result of all of this work would be rather close to the pro rata method that we use.

We do not find it necessary to make an allocation of the mandatory security valuation reserve.

Because it is a subject dear to my heart, I will describe in more detail the allocation of federal income tax. Throughout the industry, there are two basic methods of allocating federal income tax by line of business. The first is to treat each line of business as if it were a separate company and then to distribute any difference between the total of the taxes so determined and the actual tax by some formula method. The other basic approach is the combined-company approach, where each line of business is charged for its contribution to the company's total tax without reference to the tax such line would have if it were a separate company. This latter approach is used by the New York Life.

The combined-company approach as used by us makes use of the math-

ematical model of the federal income tax developed in my paper in Volume XIV of the *Transactions*. The mathematical model, by use of marginal tax rates, subdivides the tax into the amount contributed by assets, income, and so forth. Knowing the amount contributed by, say, assets, it is a simple matter to determine the portion of such contribution arising from each line of business, since we know the assets of each line of business. Similarly, the contribution of income can be subdivided, and so forth.

Within the combined-company approach there are two major variations that are possible. The retrospective method used by some companies takes into consideration the effect of prior years' experience on the five-year average earnings rate used to determine the current tax. The prospective method used by the New York Life is the one described in my paper and takes into consideration the experience only of the current year as it affects not only the tax of the current year but also as it affects the tax of the four succeeding years through the five-year average earnings rate used in those years.

In what has been said by other persons up to this point, it is clear that a major distinction is being made between realized and unrealized capital gains and losses. While I think that this makes considerable sense in the case of the so-called fixed dollar investments, such as bonds and mortgages, where there is a reasonable expectation of getting all your capital back irrespective of the fluctuations in market value, I seriously question whether the same is true of stocks. In the case of stocks one can normally get his money back only in the market place, and, therefore, one may well question whether stocks can have any other value than market value. It seems to me that if you roll over your entire stock portfolio in a given year and end up with what is substantially the same type of portfolio, you have not really done anything. Here is a case in which you may have "realized" an enormous capital gain, but you are still exposed to the same market risk that you were before. Therefore, I question if there is any real difference between realized and unrealized capital gains and losses in the case of stocks, and you have to make up your mind what you are going to do with such capital gains or losses. If you do not distribute them, you may be retaining them in perpetuity, which is unfair to the policy-owners who contributed the funds to purchase such stocks.

With this in mind, my company has made the decision to distribute both realized and unrealized capital gains and losses on a ten-year moving-average basis after making allowance for the possibility of a 25 per cent capital gains tax at some future date.

New Orleans Regional Meeting

MR. ALBERT GUBAR: Mr. Edward Green, in an article entitled "The Case for Refinement in Methods of Allocating Investment Income," in Volume XIII of the *Transactions*, discusses the reasons for adoption of the investment-year method. A later paper, which gives some of the mathematics of the methods, is Mr. John Turoff's paper entitled "Investment Generations and Asset Accumulations," in Volume XV of the *Transactions*.

The impetus for adoption of methods of allocating investment income which recognize the investment rates prevailing at the date of receipt of funds rather than the crediting of interest on an aggregate basis came from the group annuity line. Insurance companies tended to receive more funds in years when their aggregate rate was higher than the prevailing market rates and less funds when the market rate was in excess of the portfolio rate. Investment-year methods were designed to avoid this problem by crediting funds with interest based on the prevailing market rate on receipt, thus removing the possibility of investment antiselection.

New York Insurance Department Regulation 33 was changed in June of 1961 to permit the use of distributions of investment income by a procedure which recognized the year-to-year variations in the yield on new investments. Before this change only a method based on aggregate funds or liabilities was permitted.

To obtain information about the investment-year allocation methods which are in general use, I polled about a dozen large companies. The remarks which follow are based upon information received from them. I will not attempt to describe any one method currently in use but rather will present the choices which were made by the companies which I polled. Many of the choices made are interrelated.

Almost all the companies chose to use a prospective method, that is, they chose to treat all investments made through some date, such as the date of adoption of their method, as a single period of investment and to distinguish investments in the calendar years which follow as comprising new investment periods. Two companies chose to use retrospective methods, one going back five years and one twenty-five years. Most of the companies which chose the prospective approach intend to maintain each calendar year as a separate investment period. A few, however, have chosen to combine investment years until such time as the money market changes "perceptibly." By "perceptibly," one indicated that a $\frac{1}{2}$ per cent change in the new-money rate would be significant if such a change would extend for at least the next few years. The first year of such a change

would constitute the first year of a new investment period. None of the companies which have chosen the prospective approach have indicated clearly how many years they will keep separately. However, the company which chose the twenty-five year retrospective approach intends to maintain the twenty-five-year period, with investments made more than twenty-five years ago, at any point in time, combined into an ultimate investment period.

Most of the companies are using a declining index method. This is one in which the amount realized on an investment disposed of from an earlier investment period is treated as becoming available in the current year for reinvestment. Therefore, the assets associated with earlier investment years decline continuously, while the yield rates remain relatively stable. The amounts so becoming available, of course, are allocated to lines by the ratios associated with the year from which they come.

Hereafter, by "analyzed" investments I refer to investments which are identified by year of investment, and by "not analyzed" investments I refer to investments which are spread, in some way or other, over all years of investment. The spreading procedure usually used is in proportion to the amount of analyzed investments assigned to each of the investment years. There seems to be general agreement that bond and mortgage investments are analyzed. However, some companies treat government and municipal bonds as not analyzed.

Almost all the companies treat policy loan income as ascribable to the line of business which gave rise to that income. A line in which policy loans are available is usually one within which the investment-year method is not used. Policy loans can be viewed as neither analyzed nor not analyzed, and there is no necessity for determining the investment year with which they might be associated.

Realized and unrealized capital gains and losses are ascribed to the lines of business in the same way in which the assets which gave rise to them are ascribed by line. Therefore, they are analyzed if they arose from analyzed investments, and they are not analyzed if they arose from not analyzed investments.

Refinanced investments are handled differently by different companies. An example of a refinanced investment would be a bond issue of 1964 which is renegotiated in 1966 for an increased amount. Some companies treat this as an investment disposed of in its entirety by the 1964 generation and as a new investment in 1966. Since this might distort the rate for 1966, some companies have chosen to treat the original investment as remaining in the original investment year at its original interest rate and to treat only the increase in the investment as a new investment made in 1966 at the effective rate of interest on the new-money portion.

Real estate is another of the items which is handled in different ways by different companies. There seems to be general agreement that real estate used or occupied by a company is not analyzed. However, the handling of other real estate varies. Some companies treat all other real estate as not analyzed while others distinguish individual properties and, depending upon the relative proportion of the total investment entered into any calendar year, will or will not treat the property as analyzed. For example, a rule might be that a property is considered analyzed if over 90 per cent of the investment in the property is made in a single calendar year; otherwise it is not analyzed. Some companies treat all real estate, whether investment properties or not, as not analyzed.

Uninvested funds and short-term investments are handled rather uniformly by almost all the companies as not analyzed. For stock companies, they might be considered as an investment by the surplus account held for shareholders, where the surplus account might be thought of as a separate line of business.

The handling of stock varies considerably from company to company. Some companies treat preferred and guaranteed stocks as analyzed and common stocks as not analyzed, while others treat all stocks as analyzed or all as not analyzed. It is possible for companies to handle stocks in one way for allocating investment items among lines of business and in a different way within lines of business.

With respect to Question B—the extent to which the investment-year method is applied through the dividend treatment or otherwise to various lines of business—it is not surprising to find that all the companies use the investment-year method within the group annuity line. Most of them also give recognition to the investment-year method for relatively long-term group insurance funds, such as those which provide insurance coverage on retired employees. The only other place where the investment-year method seems to be used within lines is in determining nonparticipating immediate annuity rates. Presumably these companies maintain a subdivision of their fund accounts for such contracts.

With respect to Question C, information is somewhat difficult to obtain. The handling of investment expenses is relatively uniform. Very few of the companies differentiate between the expenses associated with acquisition and those associated with administration of investments. The majority spread the investment expenses in proportion to the mean assets by investment year, some in total and some by appropriate subdivisions by type of investment.

With respect to federal income tax, the complexities of the law lead one to speculate on how the tax could readily be allocated by investment year. For a company which is taxed basically on investment income, the tax

parameters involve investment yield, assets, and reserves. For between-line allocations, one could determine the investment yield and assets by a method which gives recognition to investment-year results. However, the usefulness of identifying reserves by investment year for between-line allocations is highly questionable. A typical allocation by line, therefore, might be one which determines a single tax figure for the line. When one determines the handling of the tax within a line of business, say, group annuities, it would then be possible to take one of two approaches. The first would be to treat each contract as a separate company and to determine the tax for that contract on that basis. Presumably the sum of the tax as so determined would not balance to the total tax determined for the line, and adjustments would have to be made. The second approach would be to determine the tax as a flat percentage of investment yield and apply this flat percentage charge to all investment generation yield rates before the rates are applied to funds under individual contracts.

The mandatory securities valuation reserve could be allocated by investment year by the use of the distribution of securities by investment year and then by line of business in a way which would parallel the distribution of any other analyzed item. Such an allocation of the mandatory securities valuation reserve is significant only if the reserve is treated as a charge for dividend-distribution purposes. A few companies have indicated that, for dividend distribution, the mandatory securities valuation reserve is considered to be surplus. Others treat it as a liability which would affect the dividend treatment.

These items assume much greater significance when one considers the distribution of dividends within a line of business, specifically within the group annuity line. The problem of determining dividends by contract must automatically involve the allocation of the federal income tax by contract and, if the mandatory securities valuation reserve is not treated as surplus, the allocation of that reserve as a liability by contract. The problem of allocation of capital gains arising from securities would also enter into this determination of dividends in that they would presumably need to be added to the mandatory securities valuation reserve. Various possibilities exist. It is conceivable that only the capital gains associated with transactions on other than securities would be included in the determination of the dividend or that all realized capital gains could be included and only the unrealized gains would be held back. In the latter case, there would be a strain on surplus for any contract to the extent of the realized capital gains paid through the dividend but which would also serve to increase the mandatory securities valuation reserve.

MR. JOHN C. FRASER: Some of you here may have heard my discussion at the New York meeting. I am going to take a completely different position here in New Orleans.

After listening to the discussion so far this morning, it seems to me that there is a very wide divergence between what pension actuaries are talking about when they discuss investment performance and what life insurance company actuaries mean. The reason, I think, gets into the matter of the capital guarantees granted by a life insurance company that are not found in an uninsured pension fund. I would like to use a little example to illustrate my point.

Perhaps some of you have read an essay by Stephen Leacock titled "The ABC of Mathematics." He wondered why it was that, in all problems given in mathematical textbooks, A was always the aggressive, domineering type who was always fortunate in obtaining the strongest pair of oars, the best boat, and so forth; C was always meek and retiring and seemed to end up with the broken oars and the leaky boat; and B was always an affable fellow who was trying to protect C against A. In my illustration, I will turn the tables and let C get the better of A.

A feels that he would like to make a little money. He knows that he can purchase an investment with a $4\frac{1}{2}$ per cent yield, and he also thinks that B will be stupid enough to accept 4 per cent; so he goes to B and asks B if B would give him some of his money to invest for him, on which A will pay him 4 per cent. B thinks that this is a fine arrangement, so he gives A \$1,000, which A promptly invests in a $4\frac{1}{2}$ per cent bond. A sees that he has a nice arrangement here; he can keep the $\frac{1}{2}$ per cent difference for himself. He likes it so well that sometime later he decides to make a similar arrangement with C. However, in the meantime, yields have risen from $4\frac{1}{2}$ to $5\frac{1}{2}$ per cent, so that A feels that it will be necessary to offer C 5 per cent on his money. He does so, and C is quite enthusiastic about the arrangement and gives A \$1,000 to invest for him. A is just about to invest C's money when he gets a call from B, who has gotten himself into financial difficulties and needs his \$1,000 back right away. A now finds himself in the delightful position of having to turn C's money over to B, leaving himself with a $4\frac{1}{2}$ per cent investment and a 5 per cent commitment to C. He could, of course, sell B's bond in the market, but, if he does so, he will simply capitalize his losses. A's mistake, of course, was to have given B a capital guarantee and also the unlimited right of withdrawal.

This illustrates, I think, the risk that a life insurance company is assuming when it offers capital guarantees. It has been commonly sup-

posed that the greatest risk undertaken by an insurance company is the mortality risk. In my opinion, it is the investment risk. It is in the investment area that a life insurance company is doing its greatest risk averaging, since capital guarantees imply the risk averaging of capital. The minute you get involved in something like the investment-year method, which gets away from the averaging of interest rates while at the same time retaining the risk averaging of capital, you have to be careful with respect to the withdrawal provisions that you provide. This is why you must have withdrawal penalties on group annuity funds and why you should not use the investment-year method in the ordinary side of the business except in the case of immediate annuities, where there are no withdrawal provisions at all.

MR. HENRY S. BEERS: When you worry about whether you ought not to give policyholders a dividend from capital gains, you must remember that your company's apparent capital gains (which arise mainly from appreciation in market value of common stocks) should be reduced by the (possibly substantial) capital losses which your bonds would show if valued at market.