RECORD OF SOCIETY OF ACTUARIES
1982 VOL. 8 NO. 3

ALLOCATION OF ASSETS AND INVESTMENT INCOME

Moderator: KENNETH W. STEWART. Panelists: DAVID A. LONEY, DANIEL J. McCARTHY, DONALD R. SONDERGELD

1. Implications of allocating specific assets to particular lines of business
   a. Consistency between pricing and investment practices
   b. Participating versus non-participating business
   c. Equity between classes of policyowners
   d. Effect on competitive position
   e. Regulatory constraints

2. Introduction and management of specific allocation procedures
   a. Preview by regulatory authorities
   b. Prospective or retrospective introduction
   c. Influence on valuation
   d. Experience monitoring
   e. Internal and external financial reporting

3. The principal allocation methods - how they accomplish objectives

MR. KENNETH W. STEWART: I am the Investment Planning Officer for London Life Insurance Company, a moderately large Canadian stock company with assets of about $4 billion. My responsibilities include coordination of the strategic and operational investment planning, research to support the Investment Directors in their work, and our program of generalized asset/liability management.

When we were putting this panel together, our topic outline from the Program Committee read: "Allocation of Investment Income". The first thing that we did was to change that. Investment income comes from assets. When we are allocating investment income, we have as a consequence, an allocation of invested assets, either direct or implied. We can look at the process from either end. On the one hand, if we have allocated investment income, we must also have allocated assets. Alternatively, if we have allocated assets, then the allocation of investment income will fall out accordingly. Our panel today will address the implications of allocating specific assets to particular lines of business. We will also examine both the introduction and the management of specific allocation procedures and how the principal methods work in practice.

Each of our three panelists has direct personal experience in this field and is well qualified to discuss our topic from the viewpoint of the practising actuary. Our first speaker is Donald Sondergeld, Senior Vice-President and Chief Actuary of the Hartford Life Insurance Company. Don will speak largely, but not exclusively about the first topic on our agenda and he will share with us what they have done at The Hartford.

MR. DONALD R. SONDERGELD: I have been asked to discuss this topic from a U.S. perspective. My background consists of 27 years of experience in the U.S. life insurance industry, all with stock life insurers. I am Chief Actuary in my company, so I am concerned with the adequacy of reserves, sufficiency of surplus and profitability of all of our operating lines of business. I am also the senior officer responsible for The Hartford's Group Pension Operations, so I have a special interest in our topic.

Why is this topic on the program? The reason is inflation. Not only are many topics on the program inflation-related, but you may recall that the Special Topic Meeting of the Society, held in Houston in April of this year, was titled, "Inflation and Our Changing World." One of the keynote speeches was titled, "Inflation And The Decay Of The American Financial System." There were Panel Discussions titled "The Financial Risk To Life Insurance Companies From Changes In Interest Rates", "Investment Vehicles To Cope With Inflation", and "Matching of Assets and Liabilities." There were others. They are all inter-related and they bear on our topic.

Can long term rates of inflation be predicted? Of course not. This also means we cannot predict future rates of interest. In the good old days when we had little or no inflation, the consumer was looking for the best rate of return. Back in the 1940's, ten basis points were important. However, in an inflationary environment, the customer is more concerned with staying even and wants an investment that is inflation-proof. This means that it is not possible for insurance companies to make meaningful long-term interest guarantees.

Beginning in the 1960's, companies began changing from an aggregate method of allocation of net investment income to each line of business to investment generation or new money methods. Each generation of new money usually consists of a calendar year, although there is no theoretical reason against using a shorter or a longer period. This new money approach was adopted to accommodate the needs of the group annuity line of business. At that time, interest rates were rising and life insurance companies could not compete effectively with banks and other savings institutions if they continued their practice of crediting a company average portfolio rate on all generations of assets. The new money method was also viewed as providing greater equity among policyholders.

About 20 years ago, Ed Green of the John Hancock wrote a paper on the Investment Year Method (IYM). It was published in the 1961 Transactions and was titled "Refinement of Allocation of Investment Income." The purpose of the paper was to examine two subjects: "equity" and "practicality." I will quote a sentence from this paper: "In general, equity seems to require that any allocation made to the fund of any one class of policyholders should be in proportion to the item being allocated and that the classification system be subdivided sufficiently to reflect any major differences in characteristics that affect financial results." The paper also states that there might be a conflict between the equity principle and the sharing of risk principle, if the subdivisions of classes are too small.

The debates that occurred 20 years ago on whether the portfolio-average method was a more or less equitable method of allocating investment income than IYM have disappeared. Inflation has become less temporary than originally perceived. It is larger and has been fluctuating. Although there are still practical considerations on the administrative side, increased computer sophistication has expanded the scope of practicality as well.

Mutual companies seem to be concerned about something called equity, whereas stock companies are sometimes perceived as being more interested in profitability. We have all heard the expression "compete or die." Death is part of life and a product line that is not competitive is destined to die an early death. Now where do equity and profitability fit in with competition?

In both stock and mutual companies a product can only be competitive and profitable if equity principles, as perceived by the consumer, are used in the initial design of each product and in its ongoing administration. This includes the crediting of interest to those products we offer that develop meaningful reserves per dollar of premium. Therefore the method of allocation of investment income must be both equitable to the policyholder and profitable to the insurance company, irrespective of whether the company is stock or mutual.

Let us now turn from the topics of equity and competition to explore the subject of investment risk. Incidentally, this risk is probably greater for those companies that credit interest on a portfolio average basis, as compared with IYM. To eliminate our exposure to such a risk, we can offer a market value cash-out provision in our products. This is common in group annuity contracts. However, it is not normally allowed for individual life or annuities and efforts should be made to modify the nonforfeiture laws, as they require book value to be paid. The book value requirement may have seemed reasonable at the time of the enactment of those laws, but is not reasonable if inflation is a possibility.

Separate accounts (stock, bond, money market, real estate, etc.), which are valued at market, are used in many products offered by life insurers. These products provide additional investment options for our customers, and, at the same time, transfer the investment risk to the policyholder. However there are products offered whose liabilities are part of the general (or fixed) account of the insurance companies. These general account reserves which make up the large majority of our liabilities may or may not contain meaningful, long term guarantees of interest, but there is usually a contractual guarantee of principal. One thing being done these days is the building of increased liquidity into the general account portfolio. Another strategy is to shorten maturities. In addition, there is increased use of "matching" of assets with liabilities. To assist in matching, companies are breaking their general accounts into business segments. Matching actually provides another refinement in the allocation system by recognizing the different lengths of assets relating to the liabilities of different products. A matching policy can reduce, but does not eliminate the disintermediation risk. Surplus is also needed. The big question is, how much surplus?

At the 1981 spring meetings of the Society of Actuaries held in Anaheim, California, and Ottawa, Ontario, there was a panel discussion entitled "Relationship of Product Design and Investment Philosophy." Lou Garfin, Senior Vice-President and Chief Actuary of Pacific Mutual made the following comments at the Anaheim meeting: "Surplus objectives should be set considering both the liabilities that will be created and the investment strategy that will be followed. Surplus levels should be carefully monitored and compared with surplus objectives so that management action can be taken at the first sign of danger. In addition, surplus objectives should be re-evaluated as economic conditions change...Overall, there is a need for very close coordination among product design, investment strategy and surplus objectives. When interest rates were low and stable, this coordination was not as critical. Today, it is absolutely essential." I could not agree more.

Jim Attwood, Executive Vice-President and Chief Investment Officer of the Equitable stated at a November 1981 ACLI Panel Discussion titled "The Changing Insurance Market, Implications for Investment Policies" that: "There must be a better matching of assets and liabilities in turbulent and volatile environments, and this presents the major challenges for the investment management of life insurance companies today - how to invest company assets to match liabilities and to do this to obtain consistently a positive and real rate of return in the face of continuing high levels of inflation...In addressing this challenge, the investment manager needs first to understand the liabilities underlying each of the company's businesses, expected amounts and expected timing of future payments to insurance and pension customers, as well as the extent to which such amounts and timing may vary from expected, and then to structure the company's assets to accommodate an investment policy and strategy most appropriate to meet the needs and liabilities of the company's various businesses." Mr. Attwood then discussed the segmentation of the Equitable's general account into six segments. There are five business segments, plus a corporate segment. I recommend that you read his entire speech.

My company was one of the first U.S. companies to use segmentation within the general account. For many years, segmentation was accomplished by using our three separate life insurance companies, and we still do. All of our health insurance and group insurance reside in one company. Our variable annuity business, which is predominantly Public Employee Deferred Compensation and Tax Deferred Annuity business, is contained in a second company. Although this company is called a "variable annuity" company, 70% of its reserves are in the general account and only 30% in separate accounts. Let me now talk about our third life company called Hartford Life.

The reserves on most of our individual life insurance business, and all of our corporate qualified group pension business, are held in Hartford Life. A few years ago, we determined that the investment policy regarding risk and maturity distribution should perhaps be different for these two major lines of business. We were also well aware of the differences in cash flow patterns, the different liquidity needs, and the fact that realized capital gains and losses were directly utilized in crediting rates of interest to our group pension policyholders. For these reasons, we split the general account in Hartford Life into two pieces as at December 31, 1978. We considered doing this only prospectively, but that would have created three general accounts, the existing one and the two segments for future cash. Instead we split our general account into two pieces called "Group Pension" and "All Other." We actually separated our general account assets into two portfolios and we maintain separate cash books.

Let me give you some background on the steps that led to this result. First, we discussed by telephone with the New York Insurance Department what we wanted to do. As we received a favourable response, the proposed approach was then outlined in a letter to New York in July of 1978. After further telephone discussions with New York in the latter half of 1978, we were asked to amend the Investment Generation Method that was on file. We did this on February 11, 1979, and received written approval four days later. This quick approval was the result of the many open discussions that we had with New York. They knew what our filing letter was going to say and what their action was going to be.

The initial segmentation was accomplished by keeping a number of points in mind. We wanted the 1978 investment generation yield rates, that applied to each generation of assets for the total portfolio, to be equal to the yield rates of each segment. We also wanted similar quality and maturity in the separate portfolios for each generation. At one time, we had considered making this change only for management reporting purposes, but felt it was desirable to have the allocation of investment income consistent on statutory reporting and management reporting bases.

The New York approval of this change in method was effective January 1, 1979. We did indicate in our filing letter that the allocation of assets by line of business was for the purpose of determining an allocation of investment income and would not serve to restrict the backing of policyholder obligations for either line of business. This latter concept seemed to be very important to New York. However this segmentation will also help us in keeping score, and in developing a matching policy for the separate lines of business, and in understanding our various businesses. This should enable us to better manage our business, including our surplus.

We made another matching modification last year. This was to place the single premium annuity business written by the group pension line of business in a separate account. We filed a separate account plan of operations with New York and received approval from that Department. Although this was done primarily for matching reasons, we did not wish to mix those assets with other group pension general account assets, as this could have distorted our new money rates. This result could also have been accomplished with further general account segmentation which, in effect, it is.

We are considering further segmentation of the general accounts of our three life companies. One product, high on our list, is something we call "claim annuities." These are single premium annuities used in settling casualty claims. They are also referred to as "structured settlements." This business could form another segment. We are also considering placing our universal life insurance in an additional segment.

Despite the use of separate companies, and segmentation of assets within a company, there are items that need overall coordination at the corporate level. These include negative cash flow and capital gains. In addition to the operating lines of business in our various life companies, we have a corporate line of business. If an operating line of business has negative cash flow, it should borrow from the corporate line of business, or from an outsider, rather than from another operating line of business. Consider an operating line of business consisting of a single premium product that guarantees a 15% interest payout each year with a book value cashout in ten years. Problems can arise if the positive cash flow from that line of business is used to fund the negative cash flow from another line of business. If the borrowing line of business borrowed in excess of 15%, and then repaid the loan the following year when interest rates were 10%, the lending line of business would be in trouble unless the borrower borrowed for 10 years, with a market value adjustment if the loan is liquidated in less than 10 years.

In summary, greater segmentation is necessary to intelligently operate our various insurance businesses with their different cash flow patterns. I am convinced of the increased need to have the actuarial and investment operations of each insurance company cooperate fully in the determination of the design, pricing and investment policy associated with our various products. This is more important today than ever before.

MR. STEWART: Our second panelist, David Allan Loney, is the Actuarial Vice-President at the Canada Life Assurance Company at their Head Office in Toronto, Ontario. Allan was formerly with the United Kingdom Office of the Canada Life until he was specifically allocated to the Head Office in Canada. His functions are corporate actuarial and they include a recent allocation of their assets by line of business within each of their territories.

MR. DAVID A. LONEY: I am making this contribution from the standpoint of an actuary active in this field and employed by a reasonably large Canadian mutual, the Canada Life, with assets around the $4 billion mark. We operate in four countries: Canada, United States, United Kingdom and Ireland and we actively transact most types of group and individual policy business in each of those countries.

We have, in the last 18 months, taken major steps to ensure that we have a much better knowledge as to which groups of assets are associated with which liabilities. The obvious corollary of this is the attainment of much better knowledge as to which streams of investment income should be allocated to which liabilities. Until we embarked upon this program, our existing method of allocating assets and investment income was largely based on prorating within currency. For example, our Canadian liabilities for all lines of business were credited with the average Canadian earned rate of interest.

Why did we feel that something considerably better was needed? There were several reasons. First, formulation of appropriate investment policy. In common with most companies, we are finding that product types and net cash flows into those products are changing faster than ever before. For example, many companies in Canada have seen a significant slowing of net cash flow into life products and a very large increase in cash flows to cash accumulation types of annuity contracts. These differ significantly in liability characteristics from earlier types of annuities. Most of these products are nonparticipating and involve very significant guarantees.

Given this fast-moving environment, it is absolutely vital that one be able to tell with some precision which assets are being held to back which liabilities. Only in this way can the appropriateness of past investment policy and the effectiveness of its execution be accurately assessed, and present and future policy formulated intelligently.

Heavy cash flows into nonparticipating annuity business, together with high and strongly fluctuating interest rates mean that it is important not only to purchase investments with an adequate yield, but also that these investments have an appropriate term. This again points to the need for precise knowledge as to which assets back which liabilities and the need to achieve consistency between pricing and investment practice, or, more generally, greater integration between asset management and liability management.

The second reason was to improve our reports on the profitability of our organization split by different lines of business. Accurate allocation of investment income is absolutely essential. I can see no way it can be done otherwise if reasonably credible profitability statements are to be developed by line of business. Reliable profitability statements are central to achieving two important objectives. Equity between different classes of policyowners is one of these. The most obvious example is in respect of dividends. It is important to know reliably how much total profit was earned by the various groups of policyowners in order to do a good job of distributing that profit within those groups. An equitable distribution of profit will not be possible if the major source of profit, excess investment income, is not accurately allocated. The second objective is establishment of sound pricing criteria. Reliable profitability statements by line of business are essential to assessing the appropriateness of past pricing criteria. They may also be of great help in maintaining a strong competitive position. For example, you will be more likely to accept thin profit margins in the pricing basis if you have access to reliable profit statements for that business in order to monitor whether those thin profit margins are being achieved or not.

The third reason that we felt a better method of allocating investment income was needed was to improve our ability to determine appropriate valuation bases. I am speaking here in a Canadian context. In Canada, the Valuation Actuary has a duty to set up liabilities which are appropriate and adequate and to take into account the assets in setting his valuation basis. There are few specific constraints on his choice of valuation basis. In order to arrive at an appropriate assumption as to interest, it is important to have fairly precise knowledge as to which assets support which liabilities.

Improving our allocation of investment income was rendered increasingly important by several influences. Our product types were becoming diverse and fast-changing. The single premium/annual premium mix was changing rapidly. The non-par/par mix was changing rapidly. Product lifetimes were shortening. Interest rates were fluctuating widely. Most of these influences are themselves a result of inflation and the uncertainty it brings.

Having decided to improve our knowledge of our asset/liability relationships, there was a wide range of choices available. These ranged from something close to the position we were in, that is the maintenance of one fund with investment income being prorated, right across the spectrum to the operation of separate subsidiary companies for each major line of business. Somewhere in the middle is the popular Investment Year Method.

We decided on the segmentation of our accounting system and our investment records by major line of business. Each investment we own is allocated to a specific fund. The net cash flow from premiums, investments, claims, etc. is available from the accounting system daily. Taxes and expenses are charged to the operating funds monthly. New investments are acquired for each fund according to net cash flow for that fund and in line with the investment policy established for each fund. The investment records are marked appropriately. To some extent, each fund operates like a separate company, while hopefully retaining the many advantages of being part of the larger whole.

This decision to accept what is popularly referred to as "segmentation" reflected our feeling that the more general methods such as IYM required almost as much work as segmentation if they were to accurately reflect the real world and its many complications. At the same time, they would not have the same credibility, ease of understanding and flexibility as the method which we adopted. Most crucially, they tend to concentrate on the appropriate distribution of investment income, and are not very conducive to providing information on the nature of the assets supporting a particular group of liabilities, for example, the term or duration of the assets. This is particularly important if proper steps are to be taken to control the risks to profitability arising from interest rate fluctuations.

The risk is particularly great in respect of single premium annuities. These form an increasing proportion of our company's liabilities. We felt we would be best able to control the risk if we could regard specific investments at any point of time as being assigned to support the specific annuity liabilities. The appropriateness of the assets to the liabilities could then be clearly observed and steps taken to contain the risk within acceptable limits.

At the present time in each country, we are maintaining separate funds for Life, Health and Annuity and for Group and Individual products. Thus, there are six operating funds within each country. Each of these funds contains, in addition to the investments supporting the actuarial liabilities, a portion of surplus which is available to support the development of that line of business and to absorb adverse experience in that line. The remaining surplus is maintained as one additional fund and it contains investments in each of the countries in which we operate.

We had the option of establishing funds for new business only and continuing the single existing fund for old business. Don mentioned a few moments ago that his organization was faced with the same choice, and we made the same decision. Initial fund sizes were determined by reference to the policy benefit liabilities in our annual statement. Surplus was divided between the funds, using a formula which took account of the nature of each fund's liabilities.

The major objection in principle to retrospective allocation is the fact that one is selecting assets and allocating them among policyowners (and shareholders in the stock situation). You are doing this allocation after the event, changing the rules of the game halfway through. This may indeed be a valid objection if there are significant numbers of participating policyholders of an accumulation nature and more than one fund within a particular country. The objection may also be valid in the stock company situation. In our case, the overwhelming majority of participating policies in each country were concentrated in the individual life fund. There are no shareholders. In these circumstances, we felt justified in segmenting the existing assets and liabilities.

The actual process of segmenting the existing assets was arduous and revealed some very important information that qualified and confirmed a number of past impressions and exploded a few myths. To achieve an acceptable result, personnel must be allocated to the task. Some personnel who have a thorough knowledge of the asset structure of the company and a working knowledge of the liabilities, and others who have a thorough knowledge of the liability structure and a working knowledge of the assets, are essential. We had always matched our assets and liabilities by currency and Canadian legislation requires the maintenance of physically separate health assets. Since the health liabilities were predominantly group, the allocation was straightforward. The major task was to allocate the assets between five funds in each country: Individual Life, Individual Annuity, Group Life, Group Annuity and Surplus.

The Group Life liabilities were split between short term liabilities, outstanding claims and so on, and those that were essentially annuity in nature (Survivor's Income Benefit, etc.). The short term liabilities were obviously covered by short term assets. This left us with three types of annuity liability: those stemming from Group Life, Group Annuity and Individual Annuity. The annuity type liabilities were covered by mortgages, bonds and cash. As far as possible, we ensured that the liabilities were matched by assets which were of the correct term and yield and which reflected past cash flow patterns in the various annuity funds. The reason we concentrated first on annuities was because the liabilities were mainly single premium and nonparticipating, hence were capable of very precise quantification. The work was carried out by breaking down the various groups of annuity liabilities into relatively small subgroupings and rigorous checks were then carried out to ensure that, as far as possible, the assets and liabilities matched reasonably for each subgrouping.

We tried to allocate assets in accordance with past investment intentions. In other words, if a particular block of bonds was secured in the past with Group Annuity in mind, then those bonds were allocated to the Group Annuity fund. The fast growth of annuity sales in recent times had led us to adopt some very specific investment purchase programs over the last few years, particularly for deferred annuity accumulation products. The documentation of those purchase programs was of a great help in allocating a large part of our annuity assets. The Surplus fund was allocated mainly common stocks, real estate holdings and holdings in our subsidiaries, investments which are basically held for their long term growth potential. When specific investments are allocated to Surplus one becomes very aware of the division of surplus among the various countries in which we operate.

The residual assets were then assigned to the Individual Life fund and were compared to the liabilities of that fund. This fund contained the bulk of our annual premium participating business in each country and such business made up the bulk of the Individual Life liabilities. The future liabilities of this fund were probably the least well defined. Nonetheless, the residual assets were reasonably distributed by term and by asset type and also by required yield to support current dividend scales which is obviously vitally important. It might be felt that in leaving the Individual Life fund to pick up the balance of the assets, it got a poorer deal than the other funds. In actual practice, the assets that it was allocated were reasonable. Furthermore since the other funds are overwhelmingly nonparticipating and the Individual Life fund is overwhelmingly participating, steady profits emerging from the former can be used to support dividends in the latter, obviously after surplus requirements have been met.

In practice a number of iterations of the procedures outlined above were carried out before we achieved what was felt to be the optimum start position. During the process, the managers of the various lines of business were kept informed and were consulted. At all times it was necessary to remember and to remind those involved that we were allocating the assets we owned and not those we thought we owned or would have liked to have owned. The configuration of our assets was not absolutely in line with our liabilities. Indeed, it was our realization of the difficulty of closely controlling the relationship of assets and liabilities under our previous method which had really propelled us into adopting this new method.

Notwithstanding the segmentation of our assets, many aspects of our operation are still viewed on an overall corporate basis. Although much of our investment policy is determined at a fund level, the aggregate of such policies for the whole company is reviewed, both as to actual results and future forecasts. Our cash and short term resources are managed corporately and the resulting income allocated to the various funds in proportion to their cash holdings. If cash flow runs negative in one fund, it can effectively borrow from the cash holdings of another fund, provided the latter fund really wants to hold that amount of cash. The shortfall of cash flow in one fund cannot be allowed to compel another fund to hold cash. And naturally, in spite of segmentation from the solvency point of view, all our assets stand behind all our liabilities. Our initial position was established on the first of January, 1982. Our investment and accounting systems are now operating on this new system which we call fund accounting.

What do we hope to achieve now? Here are some of the things:

1. A review system to monitor in considerable detail and with considerable frequency, the inter-relationship of assets and liabilities in our Group and Individual Annuity accounts. This will be of great help in reconciling our pricing, profitability and marketing strategies in this sector.

2. We will be able to establish our valuation assumptions on a very firm basis of information as to the earning power of the relevant assets. (I am speaking in a Canadian valuation context.)

3. We now have the capability of producing earning statements by line of business on a much more realistic basis than hitherto. This will be of help to us in establishing pricing criteria and monitoring adherence to those criteria. It is already helping us when we consider dividend policy.

4. We can establish more specific policies for our Individual Life fund and for the Surplus account. In general, we will be able to be much more specific when we come to review and develop investment policy, because the results of the policies for the various funds are now maintained separately and very visibly.

In conclusion, it is clear that the inter-relationship of assets and liabilities is of the utmost importance in a life insurance company today. The exposure of an organization to the mismatching risk must be fully appreciated by management and must be rigorously controlled. The types of business which are carried on within a single corporation nowadays are more diverse in nature and changing faster than ever before. Profitability, pricing, equity and investment implications cannot be properly assessed unless a sound method exists for associating investment income and assets with the corresponding liabilities. Segmentation is a sound and viable method of achieving this and is a vitally important financial management tool in a life insurance company today.

MR. STEWART: Our third panelist is Daniel McCarthy. He is a consulting actuary with Milliman&Robertson, at their New York office. His practice includes a considerable emphasis on the design and installation of investment income allocation techniques for life companies. Dan is also one of two instructors who will be working at a continuing education seminar on this topic. In addition, Dan is a member of the C3 Risk Task Force.

MR. DANIEL J. MCCARTHY: I would like to cover essentially four topics: (i) history, (ii) some of the work of the Society of Actuaries C3 Risk Task Force, (iii) some comments on United States regulatory matters that relate to this subject and (iv) discussion of specific allocation techniques which can be considered for companies wishing to approach this subject, but perhaps not ready to bite the bullet on the question of segmentation.

Let me turn first to the history. As Don suggested, back in the days when there was not much inflation, it was common, and in fact almost universal, for companies to allocate investment income by some global technique, either mean liabilities or mean funds, and that practice took place up until the end of the 1950's. In the 60's, investment generation methods began to be developed, triggered primarily by the needs of the pension business. It is important to understand that, at that time, those techniques and the thinking behind them focused primarily on the question of differing investment conditions over time, as opposed to the notion that different lines of business might want to hold different configurations of assets. In fact, in the early 60's, the gospel was that this was, of course, a long term business and the longer you could invest the better off you were. Life companies had positive cash flows and we all knew that our liabilities would be longer than the longest assets we could find. The thinking at that time was aimed primarily at differing investment conditions in different times, usually different years, and not at different asset mixes.

Moving into the late 60's and early 70's, there was increasing recognition that this question of investment income allocation, and the implicit asset allocation behind it, addressed a variety of equity questions other than pension questions. For example, a number of companies who had both par and non par funds began to use investment generation methods to distinguish the allocation of investment income between those funds. Companies also began using these techniques to measure equities between different generations of participating policyholders. Though there was no outright commitment to the notion that different lines of business or different products ought to have different asset mixes, at least there was increasing recognition of the fact that some kinds of assets ought to be handled specially. The initial global investment generation technique began to be refined. Finally, during this period there was an increasing use of separate accounts for products other than those whose investment results were linked directly to the separate account performance, and an increasing use of separate companies for specific purposes. This is effectively the ultimate in segmentation.

The years of the late 70's and the early 80's have now given us far wider recognition that the allocation issues relate not only to differing investment conditions at different times, but also to the fundamentally different asset needs of different product lines. These have been coupled with an abrupt awakening to the fact that insurance company liabilities are not as long term as we had once thought, and finally, to the acceptance of unpredictable economic times as the only operating certainty which we can count on.

The notion that different lines of business have different asset needs gives me a useful transition to talk a little bit about the work of the Society of Actuaries Task Force. Let me try to describe what C3 risk means. Several categories of insurance company risks have been developed for analysis purposes. The first of these, called C1, is an asset risk. It is the risk of default. While it is related to changes in the interest rate environment, it is convenient to separate the default risk from risks which affect the relationship between assets and liabilities. The second category of risk includes the real insurance risks: mortality, morbidity, and so on. The third category, called C3, is the disintermediation risk. It is the risk to insurance companies resulting from changes in the interest rate environment, other than those that might trigger a default. You can think of it as the mismatching risk if you like. There is also a category 4, which includes such prosaic things as lawsuits and other business risks.

The risk of disintermediation or interest rate shift is the subject of the C3 Risk Task Force of the Society. It is important to note at the outset that this is a company-wide risk. It is not a risk for a particular line of business, although it may be convenient to analyze it that way. It is a company-wide risk, in spite of separate accounts whose assets may be specifically and legally dedicated to certain liabilities. Segmentation or other techniques of asset allocation do not really change the company's risk at any point in time, because in total, the assets are what they are, the liabilities are what they are, and the mismatch is what it is, (although we may not know what it is). Therefore, the risk is present in total without regard to allocation techniques. However asset allocation techniques are extremely helpful in measuring the components of the risk by line of business and, therefore, in understanding the degrees of the company's exposure to this risk, and to changes in that exposure over time. If the risk is analyzed on a line of business basis, and it is hard to analyze it any other way, there may be offsets among lines. If you were able to analyze the company's risk exposure and determine the amount of surplus needed in some reasonable environment to cover the risks for each line of business, the total risk to the company would not exceed the sum of those resulting from line of business analyses. In certain environments, it might turn out that one line of business would need surplus to cover the risk, while another line would have surplus buried in the reserves. Analyzing the relationships among lines of business is complex, but will sometimes produce offsets to the risk.

The C3 Task Force has identified three steps that are going to be necessary to put this question of interest rate risk in proper perspective. First, consciousness raising among both actuaries and regulators as to the nature of the risk and the kinds of exposures companies have to it. Second, research to increase our understanding of the nature of the risk and techniques for measuring it, and also communication of research results, both among ourselves and to other interested parties. Ultimately, this will have to get into standards of practice. In the United States, that becomes an issue for the Academy of Actuaries which essentially writes our guides for standards of practice. There has been very close coordination between the Society Task Force and the appropriate Academy committees in this matter.

The research to date by the Task Force has focused on examining the characteristics of specific lines of business, not necessarily of statutory statement lines but of product lines where the products have identifiable and similar characteristics. The question of combination among lines has not been explored in nearly as much detail yet and is probably best dealt with when we feel we have a better handle on the issues in specific lines of business. The lines of business that have been explored thus far in varying degrees are as follows:

1. Guaranteed Investment Contract business. These contracts typically involve fixed commitments, interest guarantees, book value promises at certain points of time, maturity in stages or in one lump, and a market value if funds are withdrawn before maturity.

2. Participating Whole Life.

3. Non Par Whole Life.

4. Deferred Annuities. Fund accumulation products, deferred annuities or accumulation funds under Universal Life or other products in the United States typically have a book value on demand guarantee and some kind of interest guarantee.

These are the four building blocks that the Task Force has worked with to date. They certainly do not cover all product lines that ought to be examined. For example, there are some significant issues that relate to Group Health claim reserves. One of the keys in all of this work is the assumption that one can write down some kind of a termination function; both for assets and for liabilities. In the case of assets, termination includes the exercise of call provisions. In the case of liabilities, it means obviously withdrawal or policy loan and assumes that one can write down a termination function sensitive to the interest rate environment which will give some indication of just how long or short our assets become in certain environments. For some of the products, companies have accumulated data as to what those termination functions may be like by painful experience; in other cases they are still largely speculative.

All this research presumes that the assets for any line of business are known. That does not necessarily mean segmentation . As Ken pointed out, there are a variety of ways to implicitly or explicitly determine what assets are allocated to a particular line. Certainly it assumes that the allocation step has been taken and it therefore focuses attention on which assets a company is deeming to be associated with any particular line of business.

With regard to regulatory matters, the New York Insurance Department recognizes and takes seriously the questions of relationships between assets and liabilities and appears to be ready to work with companies which also recognize this as a serious question and are instituting changes in their allocation systems.

New York provides by letter, and soon presumably by law and regulation, a clearer role for the actuary in an opinion letter identifying his test results as to the relationship between a company's assets and liabilities in lines of business where the company wishes to take advantage of all of the interest rate flexibility provided in the 1980 amendments. This indicates that, at least in one body of law and regulation, there is developing recognition that an actuary ought to be sure that the reserves are proper, and that in thinking about whether they make good the specific provision to mature the liabilities there has been some examination of the related assets.

The situation in other states is somewhat different. California and New Jersey have specific interest in and concern about asset/liability relationships in certain contexts, particularly for products with index linked guarantees. Many other states appear to be taking no action in this area, probably because they are not staffed to do so. Note, however, that some states are conscious of allocation issues in the traditional equity sense - that is to say, particularly between participating and non-participating funds, but either by virtue of a limited staff or a feeling that they do not have legal authority to do so, have not yet exercised very much interest or regulatory activity in the relationships between assets and liabilities.

On the question of standards of practice, the N.A.I.C. opinion letter requirements, which call for the statement by the actuary that the reserves make good and sufficient provision to mature the liabilities, will undoubtedly be expanded once some of this research is in place and everybody is able to figure out what it indicates for working actuaries in terms of the Academy's guides, i.e. the analyses the actuary must make in order to reach such a conclusion. It does not necessarily follow that all those analyses will be stated in the opinion letter but, just as an accountant's work papers back up the accounting opinion, so an actuary's work papers are going to have to back up "good and sufficient". Thus the question of which assets the actuary is relying on will become important.

Now a bit about techniques for allocating assets to lines of business. First, you need a fairly precise tracking of your cash flow by segment. Don pointed out that in the Hartford they maintain separate cash books. Allan indicated that the cash flow is traced precisely by line and that it takes a substantial commitment of people representing both sides of the balance sheet, each with some knowledge of the other side. Each of those approaches is substantial and often will be well justified by the results obtained. For some companies (or for some lines of business which may be lumped into one segment for convenience, but in which it is necessary to do some further breakdown) that effort may not be necessary in view of the precision required by the company, particularly smaller companies. Some of the larger segments at the Equitable are over 10 billion dollars in size and that obviously requires very close attention to what is in each segment. If you have smaller segments you may be prepared to live with somewhat more global techniques. What are the goals, after all, of segmentation? There are two.

1. It provides a mechanism for allowing different investment strategies for different segments of business, consistent with the needs of the segment.

2. It focuses management attention on asset/liability matching issues and therefore enables people in a company to come to grips with what it is they are trying to do and just how the line-up of assets and liabilities takes place. Though one can say which assets or slices thereof belong to certain lines, it does not crystalize things quite as much in people's minds as having a list and saying here is my segment and here are the assets.

I will briefly describe a technique short of full segmentation which companies can consider if they decide, in certain areas or perhaps for all lines, that their needs do not require the precision of segmentation.

Consider the outset of an investment year or an investment generation method. (I say year or generation because it does not necessarily follow with today's quickly moving interest rates that you want to use a year as the generation.) Imagine creating within each of those generations, or within each generation as it is created, several different pools of investments with each pool having different characteristics. Now the most obvious differentiation, in terms of all the discussions about assets and liabilities, is different length of maturity. To over-simplify, imagine a short term, a medium term and a long term pool. There are other kinds of differentiation that could exist as well. For example, it is entirely possible that a company would want to have one pool of investments of significantly different quality from another, or with significantly different tax characteristics.

Once the pools have been established and you go out to acquire investments during the year, how much do you get in each pool? Under this approach, a company would estimate at the start of the period its expected net cash flow from each line of business and, based on the needs of each line (this requires a fair amount of discussion), and the expected availability, quality and yield of various categories of investments, would establish targets for amounts to be invested in each pool during the year.

Inevitably, as time passes during the year, things do not happen exactly as expected. The cash flow from each line will not be exactly as expected, the desirable investments won't be exactly as expected, and so on. There are mid-course corrections that are needed during the year. The targets have to be reviewed periodically. One has to look at what has actually transpired to see how close the mixture is coming to what is intended. It may be established in discussion with management that line of business A needs 30% of its assets from pool 1, 50% from pool 2 and 20% from pool 3. If you go through that exercise for every line, you have then established an ideal allocation. Since the ideal will never take place in fact, one needs to have some preference rules. At the end of the year or other period, when each line of business is assigned its share in each pool for the future, the preference rules will deal with the breakage, the fact that the pools do not have exactly the right amounts of investments. Once the allocation is made, ownership in each pool then rolls over as the pool rolls over, just as under either a traditional IYM or under segmentation. Once ownership is established, it does not change until the assets mature and are then reinvested to generate new cash flow.

This system is intended to do two things.

1. It focuses on the differing needs of different lines of business.

2. It stops short of the precision in tracing of cash flow and investment requirements needed for segmentation and is a significant advantage when the circumstances become right for segmentation. It

is a kind of "you get what you pay for" approach. There are techniques in between that do not produce all of the advantages but do not require all of the labour either.

Perhaps more important than any allocation system's specific characteristics is that there is a need today, in every insurance organization, to give visibility to the necessity of thinking about assets and liabilities in relation to each other rather than separately. Although this theme has been on Society programs for a few years now, in my experience it takes more time than that to translate discussion into widely understood practice. Neither a traditional mean fund method nor a traditional investment generation method forced this issue on management. Methods which require specific thought about the needs of each product line do force the issue and therefore, apart from their obvious effect on allocation, cause companies who take them seriously to move so that their asset and liability portfolios will be more in balance. At least they will understand what the mismatches are and what the possible good or bad consequences of those mismatches (depending on the environment) could be. This is a healthy development and it is extremely significant that more companies both north and south of the border have been taking this issue seriously.

QUESTION: Don, within your product asset segments for the Hartford Life, do you run a traditional investment year method?

MR. SONDERGELD: Yes we do.

MR. WAYNE A. ROTHMEYER: Mr. Sondergeld, do you use the same allocation method for statutory purposes that you use for internal reporting?

MR. SONDERGELD: We gave some thought to even bothering to file a method with New York. One approach would just be to go ahead and do it for management reporting and continue what we had been doing for statutory reporting. We decided that keeping two sets of books could become cumbersome so we entered into a discussion with New York and found that they were receptive to the approach.

We continue to use a new money method of allocation within the two segments so that our management reporting and our statutory reporting allocations of investment income are essentially the same. I say essentially, because from a management reporting standpoint we have a corporate line of business. We do not, as some companies do, include a corporate line of business in our statutory reporting. From a management reporting standpoint, the additional corporate line gets buried in one of the statutory reporting lines of business.

MR. MCCARTHY: From the point of view of credibility with the regulators of the future, it is important for companies to take seriously what the Hartford did and to carry the technique which is going to be used for internal purposes forward as far as possible into statutory reporting.

Read what has happened recently with the casualty side of the industry and the arguments that they have gotten into with the regulators in the "two sets of books" discussions. We run the risk of some Draconian problems visited on us by the regulators unless the companies taking these issues seriously and allocating internally carry through into material which is provided to regulatory authorities.

MR. FORREST A. RICHEN: For those companies that have segmented their assets, how are you handling a default on bonds? Does the line of business that happens, by whatever accident, to hold those bonds absorb their loss, or is there a technique to shove that loss onto the corporate line or share it in some manner?

MR. LONEY: We are considering this question at the present time. I mentioned that part of our surplus is allocated to each operating fund and obviously a part of that surplus is intended to carry the default risk. Nonetheless, in terms of practical politics, and I am thinking here of internal profitability statements, I do not believe we can necessarily live with that. If we get a default on one large bond, we will have to take a corporate approach to it.

MR. MCCARTHY: There are several companies that use a kind of internal reinsurance to the default risk. That is far easier to say than to do, because portfolio qualities are significantly different. You cannot just average the whole thing by assets or you would reward unfairly the people buying the junk bonds. There are some significant analytical issues there but it is possible to develop an internal reinsurance technique.

MR. JEFFREY D. MILLER: Mr. Loney, one benefit of your fund accounting system was the establishment of pricing standards. The fund accumulation products currently being offered in the U.S. offer returns to policyholders very close to the prevailing risk free interest rate. Thus the company must assume investment risk in order to make a profit on these products. Do your pricing standards quantify the levels of investment risk that are acceptable for each product type?

MR. LONEY: I was implying that the establishment of separate funds would enable us to establish sound pricing criteria. We are aware of the situation where we have established our funds and we are in the process of establishing the pricing criteria. I do not think those criteria would include the granting of the total risk free return to the policyholder with the company picking up the difference, but rather something better than that.

MS. NELLA RANADE: G.I.C. pension companies are using both segmented accounts and separate accounts. What considerations would dictate using either the segmented approach or the separate account approach?

MR. MCCARTHY: The companies who began writing G.I.C.'s through separate accounts did so in some cases because it was easier to do that than it was to confront company-wide the question of segmentation. Although it was a convenient way for companies to deal with one product line without having to analyse the way they dealt with assets in the whole sweep of their business, it is at least conceptually a temporary approach. Ultimately the company ought to look to segmentation or some other technique for identifying assets. A separate account was simply a convenient way of doing that.

MS. RANADE: Are there more legal requirements with a separate account?

MR. MCCARTHY: It depends on what state you are in. If you use a separate account, you are limited in the kinds of business you can write. I can not recall all requirements, but the account must be corporate, there can be no employee money in it, etc., so you do take on some burdens. In exchange for those, companies were able to get a G.I.C. product up and running without overhauling the entire allocation of company assets.

MS. RANADE: Is there any difference in the need to be precise in the segmented versus the separate account approach in tracking or estimating cash flow, and so on? Can you use approximate techniques in one and not in the other?

MR. MCCARTHY: In principle, there is probably a little more approximation in segmentation but, in reality, you get that through a separate account anyway because companies typically put in a certain amount of seed money. That seed money serves as their cushion for minor cash fluctuations or for short term needs so they can invest long term. If the line of business is sizeable, it really does not matter a great deal one way or the other.

MR. STEWART: Allan, you said that, when a fund has a negative cash flow, it is allowed to borrow from another fund but only if the other fund is willing to lend. Do you, in fact, have fund managers dickering over borrowing requirements within your firm?

MR. LONEY: I do not think we have reached that situation yet. I hope we won't. We are managing our cash as one entity. I would not want one fund which was running negative, and hence pulling down our cash, to pull down the cash of the entire organization below the level that we want to hold overall. When you get down to it, it is a different thing playing with money between funds and actually having to go and borrow the money as a corporation from a third party.