

# RECORD OF SOCIETY OF ACTUARIES

## 1983 VOL. 9 NO. 3

### DISINTERMEDIATION, INVESTMENT STRATEGY AND PRODUCT DESIGN

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1. What is the proper role of the actuary in matching assets and liabilities?
2. What criteria should be used in determining the appropriate amount of retained surplus during a period of large scale disintermediation? How should the evaluation be expressed in the annual statement actuarial opinion?
3. Is there a future for products with market value cash out adjustments? What are the problems in designing and administering such products?
4. Is indexation a useful tool in the construction of long term debt instruments? What actuarial problems are caused by an indexed asset?

MR. D. ALAN LITTLE: Let's look at the last five to ten years to set the scene for our panel today. What have we seen in the market place? We have seen tremendous volatility in interest rates and interim market values of fixed dollar investments. This period has been so unique that we really don't have any kind of historical data to go back and take a look and see what has happened in similar periods in the past. We have not seen this kind of environment before so we don't have any insight as to how to deal with what is happening currently.

We have also seen an upheaval in the financial services market. This has included new products and services. In the U.S. we have seen deregulation of the banks and the savings and loans. The brokerage houses are offering cash management accounts; the banks are offering cash management accounts. We have seen the wrapper annuities and the withdrawal of the wrapper annuities. We are seeing a merger of lines between products of banks, S&L's, mutual funds, and insurance products. In Canada they have seen that merging of lines earlier than the U.S. and perhaps we can look to Canada for some experience.

We have also seen a tremendous upheaval in the marketing and delivery of financial services. For example, we have seen the brokerage houses and their annuity sales. We see the banks and their cash management accounts. We see

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Sears, for example, buying a brokerage house; Prudential buying a brokerage house. Sears is offering, in effect, one-stop financial services through Allstate. We have also seen increased competition in the industry. We have seen decreased loyalty of our marketing forces and new marketing groups such as the stock brokerage firms. The brokerage houses have had tremendous clout in dictating product terms, so we have seen a complete change in the product terms. We have seen decreased loyalty of the buyer. We see rapid movement from one company to another — the money moves fast. We have seen a shift in product lines and product types to interest sensitive and investment responsive types of products.

Let's look at this in terms of today's topic. We are taking a slightly different approach to this subject than the other sessions have taken at the regional meetings earlier this year. Rather than dealing with risk measurement, what I am trying to get from our own speakers today is how risk measurement is used to implement investment strategies. What are the measuring tools available outside the insurance industry and how do we use them? What are the planning tools available in the insurance industry and how do we use those tools in coordinating product design and the company's investment strategy? We also have a need for better pricing tools — ones that will incorporate our pricing strategies — and tools that will provide better communication between actuaries, investment managers and management. Again, many of our new products allow us renewal pricing by varying interest credited rates, for example, and dividend rates. We have always had that capability with par products, but this is a relatively new phenomenon for non-par products, so we must have the tools and knowledge to respond faster and more effectively than in the past.

MR. RONALD K. DARLING: Yesterday I attended the computer trends session where the panelists agreed that microcomputer usage is exploding and is becoming the prime factor in the productivity of all of us. Another point that was made is the day is rapidly approaching when all professionals in financial services and other kinds of industries will be able to converse in our own language with our own computer. The microcomputer will probably predominate.

I am going to do a very quick survey of the asset-liability management tools that are currently available in other industries, primarily banks. It will become very clear from my survey that microcomputers have been a prime factor. What has happened is that the advent of the microcomputer has caused an explosion in the kinds of products that are being offered to assist asset-liability planning. As a result, I will only be able to give you a sampling. In effect, this sampling is out of date as soon as I give it.

I am going to introduce you to exposure management and asset-liability management, particularly as it relates to banks. I will then close with some very brief remarks on hedging.

During these days of rapid change in the financial services sector, all too often firms and individuals in firms tend to ignore tools and approaches which have been successful in other sectors. Clearly the general groups of tools and techniques which I lump under exposure management represent one area where most firms could learn valuable lessons from the experiences of others. For example, many in the futures industry ignore or disparage cash market and forwarding market hedging strategies. A major multinational, long active in foreign currency exposure analysis and hedging, does not employ similar concepts in their pilot use of interest rate futures and fails. I could offer many more examples. My point

is that much can be gained from a review of what other industries are doing to practically manage their exposures.

Following is a simple outline of a general exposure management approach. For you as insurance professionals, particularly as actuaries, exposure management is nothing new. You are dealing with the business of insurance which deals with exposures. I would like to start here because many companies and many people I have dealt with will tend to get a little locked into things like asset liability or hedging.

- Identify exposure by manageable category, such as:
  - What are the exposures and how are they phased over time?
  - What groupings of assets or liabilities are most practical?
  - How can the risks be measured and to what extent?
- Decide what levels of risks are intolerable enough to decide to spend some time, effort and money to do something about them.
- Decide what strategies are available to your industry, company and organization unit. These will include hedging and non-hedging strategies.
- Select the most practical strategy or some combination for each risk category. Considerations here include the cost/benefit relationship, regulatory environment, ease of implementation and management comfort.
- Execute the strategies that you are capable of executing and defer those you can't.
- Monitor the results.

There are a number of exposure categories such as insurance, political or environmental risks, foreign currency, commodity price risks and interest rate risks. Asset-liability management represents a subset of the more general exposure management which addresses interest rate risks.

Asset liability management can be defined in light of the banking environment. Basically we are talking about a continuing arrangement or re-arrangement of both sides of a balance sheet — assets and liabilities — in order to optimize earnings or to improve earnings while still providing for liquidity and safety.

During the 1950's and 1960's there was an asset management emphasis since liabilities were stable retail deposits. During the 1960's we started to see more emphasis on liability management. Loans continued at fixed rates and increased use of purchased funds started to occur. In the 1970's we started to see a combination asset and liability management being at least addressed in banks. The reason for this was volatile interest rates which caused their spreads to be squeezed.

Now during the 1980's we could say asset and liability management is emphasized. Some of the reasons that have been made are:

- Increased competition for depositor's dollars from other banks and institutions.
- Continued interest rate volatility.

- New management tools available such as interest rate futures.
- Explosion of software for asset-liability management, especially with the introduction of microcomputers.

The types of asset-liability decisions a bank makes are customer based marketing decisions or non-customer based financial decisions. Commonly in a bank an asset-liability committee (ALCO) deals with these types of decisions. They look at economic factors, rate sensitivity, run-offs, net interest margins and other factors. In general, the systems and procedures which support this kind of decision-making process -- whether they be analysis, simulation, optimization, projection or monitoring -- are termed asset-liability management systems.

The asset-liability management process in a bank might be summarized as follows:

- Asset-liability analysis
  - Review of rate sensitive balance sheets items and projections
  - Development of potential strategies
  - Selection of strategies
- Execution and management of strategies
  - Deposit and lending strategies
  - Investment and hedging strategies
  - Monitoring of results
  - Adjustment of positions
- Repeat the process regularly

The rather broad definition of asset-liability management systems affords vendors considerable flexibility (which they take advantage of) and prospective users considerable confusion. The advent of microcomputers has greatly increased both the number of software products and the number of prospective users who can afford these tools.

First, let's look at a sample of a generic report that we tend to see in a lot of products. It may not be exactly this format.

- Breaking down of some categories of the balance sheet on one side and some projection of those across time.
- An attempt to look at how the two categories compare (sensitivity analysis).

Attached Exhibit A contains a list with enough follow-up information so you can contact these vendors and get more information from them. From this list I am going to summarize some of the characteristics about these products.

On this list, there are nine products which use microcomputers. Four are offered on timesharing and five are available on microcomputers or mainframe computers. One of the vendors has an optimization model which employs linear programming techniques. The others are generally pro forma models with some degree of "what if" simulation capabilities that give something very similar to

what you might get with Visicalc and some of the spread sheet techniques. Your ability to use some kind of sensitivity analysis varies with these models. Three of these asset-liability products are offered as part of broader financial planning systems. The vendor is attempting to sell a financial planning reporting system with some asset-liability features. Several of the firms offer consulting services. Some require that you employ these services in order to use their model. The number of users in these groups varies from a few to as many as 400. A lot of these products are aimed toward a community bank situation. Prices vary from \$2,000 to \$180,000 or are quoted as being based on timesharing usage. The \$180,000 is a broader financial planning and reporting system.

Essentially most of these products address the review of current and projected rate sensitive balance sheet items and development of asset-liability strategies. Most of the products provide some simulation capability. Clearly microcomputers are the primary source of a lot of these products at this point in time. To be fair, the ones available on mainframes and timesharing in many cases have a great deal more flexibility. Many of the products serve either as entrees or support services for bank consulting services. Based upon our ALM process outline, the difficult chores which keep the professionals busy — interest rate forecasting, strategy selection, deposit/lending strategy execution, investment/hedging strategy execution, detailed monitoring and operations control are left to the bank management.

Briefly, the steps involved in implementing an asset-liability management program would be as follows:

- Asset-liability management information planning
  - Organization planning
  - Reports planning
  - Strategies planning
  - Execution methods evaluation
  - Model selection
- System Design
  - Reports design
  - Transaction systems interface design
  - Monitoring systems design
  - Model enhancements design
- Program Implementation
  - Transaction systems interfaces
  - Reporting system
  - Model with enhancements
  - Monitoring system
  - Procedures development and training

It is difficult these days to discuss asset-liability management without mentioning hedging. In fact, we have found that much of our involvement with hedging systems and financial futures in particular has been what has led us to discussing asset-liability management systems with many institutions.

The demand from financial services companies for advice, products and services related to hedging has increased considerably during the last year. New domestic and international markets and instruments, relaxing regulatory requirements or constraints, increased publication regarding banks getting involved and setting up their futures have all been contributing factors.

I would like to outline the rudiments of hedge management and briefly describe one service. First we should have a very simple definition of hedging. One of Webster's definitions of hedging is "to protect oneself from losing by a counterbalancing transaction." I like this one because it doesn't say a futures transaction; it doesn't narrow the field. What it means is, to the extent that market forces cause the value of a hedge vehicle to move in the opposite direction from what you are hedging, you can expect hedge vehicle gains to offset the losses you would incur without hedging. Traditionally, this was accomplished through cash and forward markets. More recently, financial futures and options have come forward. Related to asset-liability management, hedging offers a powerful tool. Unfortunately in the insurance industry, regulatory barriers still remain preventing broad applicability.

A highly summarized presentation of the hedge management process is as follows:

- Execution of Hedging Strategies
  - Simulate hedge positions using historical or forecast data
  - Select and initiate appropriate hedges
  - Schedule hedge rollover or removal dates
- Management Reporting
  - Track hedging through backoffice recordkeeping and accounting systems
  - Monitor hedge effectiveness with daily and historical reports

The most common question of prospective hedgers who wish to do these kinds of things or any part of them is, "Where can I get some help?" Unfortunately all too often I have to say back to new kinds of industries that since the demand has not been there to date for software products or advisory services for hedge analysis, monitoring or hedge accounting, and since the requirements for these systems and the advisory service to go along with them tend to vary much by industry, few products are currently available. Several of the asset-liability vendors I mentioned earlier do offer some degree of a hedge monitoring system or something that does relate. You won't find something that is custom fit to what you are actually looking for.

One product and service which I would like to note is the Powers Research Model (Dr. Mark Powers). Powers Research, Inc., specializes in providing interest rate hedge management services. Associated with these services, Powers Research has developed a microcomputer based hedge management system which includes the following components:

- Asset-Liability Hedge Module which identifies asset-liability gaps and selects interest rate futures contracts.

- Specific Hedge Module which identifies strategies which would reduce the interest rate exposure, lock-in funding costs or lock-in asset yields for specific groups of assets of liabilities.
- Fixed Rate Loan Module which assists in the development of hedge strategies to lock-in funding costs associated with fixed rate loans.
- Broker Reconciliation which produces daily and historical reports to monitor hedge effectiveness and to track futures positions.

In summary, asset-liability management is a complex topic with no cookbook solutions. There is a lot you will read about and dig deeper to see what is going on, particularly in the banking industry. You, as actuaries will very much be the kind of people called on to do similar things in the insurance industry.

MR. LUC GIRARD: Since the Fall of 1979, our industry has come through some very turbulent times. Over this period, we have seen our fixed income assets depreciate and appreciate by as much as 30% over a short period of time. All of this has been happening while the "Fed" is wrestling with the problem of inflation.

It is fair to say that this environment has accelerated the development of new immunization strategies, new approaches to management of the asset-liability interface and new hedging instruments. Today, we seem to be entering a period of relative or comparable stability and the question becomes...do these new inventions, approaches or instruments make sense today? If one believes that the future will be stable, then one would conclude, and rightly so, that all these instruments don't make any sense because they do involve a cost in one form or another.

On the other hand, if one believes that the recent past will repeat itself or get worse, then these new inventions may not be sufficient to manage our risk -- our so-called C-3 risk. Also, one must come up with a point of view on the financial services industry. Will there be more competition from banks, thrifts and other insurance companies? If so, in a volatile interest rate environment, competition will be the catalyst to disintermediation as we have never seen it before.

The purpose of my discussion is not to review these issues in detail, but I wish to point out that their resolution is extremely important before embarking on a course of action, since differing points of views will obviously result in different solutions.

In the remainder of my discussion, I will review the following three areas:

1. Immunization strategies,
2. Asset-liability interface management, and
3. Hedging.

There are several immunization strategies which are available and well documented in the Transactions or in other publications. I would like to briefly review four of these.

The first of these is absolute cash-flow matching. Absolute matching is sometimes viewed as the ultimate in immunization strategies since regardless of movements in interest rates, regardless of yield curve changes, regardless of sector changes, the value of surplus remains unaffected. Furthermore, re-balancing is never required once the initial investment portfolio has been established. However, this technique has very serious drawbacks which for all practical purposes rule it out as an alternative for most insurance companies. Absolute matching requires that we are able to estimate liability cash flows exactly, which is impossible for products like the flexible premium retirement annuity contract, due to surrender features inherent in that contract. This strategy could be all for naught if the benefit payments did not materialize as expected. Also, this strategy unduly constrains the investment officer since he would be restricted to the public markets where there is a sufficient array of maturities to satisfy his needs to cash match. Some techniques have been devised to maximize the return on matched portfolios; however, such methods required elaborate computer systems to ensure the portfolio is matched before and after each transaction.

The second strategy is conventional or classical immunization which continues to hold much promise, although there are some drawbacks. Empirical studies have shown that this strategy, although not perfect, has worked reasonably well. A worse case might be 25 basis points off the targeted yield. The advantages over absolute matching are that classical immunization allows greater freedom in investment choices, and changing cash flow patterns are more easily accommodated. Although not as simple and straight-forward as cash-flow matching in concept, it is simpler to understand than any of the other more elaborate techniques developed so far. At least, in my company, investment and product officers have caught on to the theory quite well, and that is important in any implementation strategy.

The third immunization strategy is contingent immunization which was developed by a large investment brokerage firm and was published in "The Journal of Portfolio Management." This strategy is really an extension of classical immunization theory and attempts to redress the criticisms that investment officers are unduly constrained. The technique requires that the funds be in a surplus position and that the investment officer risk this surplus by making calls on interest rate movements by either increasing or decreasing the term of the portfolio. If the investment officer made a succession of bad calls such that all the surplus was consumed, the investment officer would revert back to classical immunization. The rationale is that the extra investment flexibility provided will enhance profit margins. The negatives, of course, are that the interest rate calls may be considered largely speculative and the investment officer must remain on top of his portfolio each and every day to make sure he is ready to re-balance at the moment he foresees an adverse movement in interest rates.

The fourth strategy is an approach developed by James Tilley and is published in the Transactions. This is not really a strategy, but rather an approach to arrive at a strategy. Using operations research techniques — linear programming — he solves for a region of investment strategies that will meet the desirable immunization goals under all future anticipated reinvestment scenarios. Within that region, the investment officer has complete freedom. One can even solve for a region of strategies for different sets of cash-flow assumptions regardless of whether they are dependent or independent of interest rate movements. The universe of alternative investments can be expanded or



decreased. It is the most precise and flexible approach that has ever been developed. It has been criticized in that the approach does not solve for the optimal strategy, i.e., the strategy that produces the maximum profit margin. A greater problem is the sophistication of the technique. Although simple and straight-forward to some, to most it is complex. Such a technique may prove difficult to implement, especially in smaller companies.

All of these approaches can be used and should be used in product pricing. If a strategy cannot be found, that can tell us something about our product design. For example, using his technique, James Tilley discovered, to no surprise to anybody, that no immunization strategy existed for his individual FRA since surrenders were a function of interest rate movements. If we do not or cannot immunize, at the very least, using one of these approaches will help us measure the risk and thus help us determine the appropriate price.

Developing an immunization strategy, or understanding the theory, is actually the easy part; the more difficult challenge is managing that strategy we have selected. The risk of mismanagement is the greatest risk our companies face. It is even greater than the C-3 risk, itself, or the cause of this risk. In devising a management system, two primary issues come to mind and those are asset segmentation and corporate organization.

The first issue, asset segmentation is an attempt by insurance companies to group together products with similar "investment policy characteristics." The idea is then to manage the investments as separate pools of assets. The result of this segmentation is two-fold. First, financial results by product line can be more precisely determined, and second, immunization strategies can be more easily managed because communications between investment and product officers are facilitated. Segmentation can range from a full legal and accounting segregation through actual segregation of assets or could be done merely by "tagging" assets in the general account. I do not believe that full segregation is necessary although it is an ideal solution, "tagging" is probably sufficient. We have been following a "notional" segmentation through our corporate investment income allocation model; however, we have not been completely successful in using this model for management purposes since company officers have had a difficult time relating to these "notional" or "fictitious" assets in the model.

The second management issue is company organization. Most companies have line of command structures similar to that found in matrix organizations. However, I would not call these systems true matrix organizations. The matrix structure is there all right; however, systems, the behavior of its officers and the corporate culture are not consistent with that found in strict matrix organizations. For example, there is still the persistent desire of both investment and product officers to operate independently of each other, and this behavior is inconsistent with a true matrix organization. This behavior would be quite satisfactory if there were very little inter-dependent information processing requirements between the product and investment officer and we were in stable economic times. However, if there is a great deal of information processing required between investment and product officers and we are in unstable economic times, a matrix structure in the improper systems, behavior or culture could have disastrous consequences for a company. In an apparent attempt to encourage the appropriate behavior and to develop the right culture, two companies that I have heard of have restructured their organization by combining their pension operation with their investment operation. This is an

interesting phenomenon, and one wonders if this kind of restructuring is going to spread. In theory, there are many other ways to induce the appropriate behavior; however, we have not yet discovered the correct strategy.

Similarly, with the acceleration of the development of immunization theory and asset-liability interface management, we have had a proliferation of new hedging instruments. These hedging instruments include financial futures, cash instruments, forward contracts and options. Each type has its own particular advantages or disadvantages, and one instrument will be better than the other depending on the situation you are in. The instruments I would like to focus on in this discussion are financial futures.

Like commodity futures, financial futures allow us to lock in a price which could be either a selling or a buying position in the future on the most universal commodity available...money. There are three contracts worthy of consideration and these are the GNMA, Treasury Note and Treasury Bond contracts traded on the Chicago Board of Trade. They are particularly attractive contracts for use in immunization because of their liquidity, transaction costs, and the ease and speed at which transactions can be executed. However, of course, there are some legal or regulatory issues. From a study done by a large accounting firm in 1982, 18 states specifically allow their use through legislation or policy. As many as 17 states disallow futures and the balance of 15 have no policy whatsoever. The Department of Insurance in Canada has also authorized the use of futures for hedging and with New York in the process of considering legislation, the trend is definitely in the direction of allowing their use.

Futures can be used in a variety of ways in product pricing and immunization. The most straight-forward is to lock in an interest rate on future deposits to a guaranteed investment contract or on future premiums to a flexible retirement annuity contract. Another use might be to adjust the duration of assets to match more closely with those of the liabilities. Still another usage would be the warehousing or inventoring of investment product by acquiring the product and then selling futures opposite this product. Contrary to what is sometime believed, one cannot use futures to "sneak" up the yield curve because futures prices reflect the yield curve structure. In other words, one cannot create a short-term asset that produces a long-term yield. However, futures can be used to create certain investment products not otherwise available in the market place. For example, one could shorten the duration of mortgage investments if short-term mortgages are not directly available in the market.

Although futures are valuable tools in reducing the C-3 risk or in improving product design features, they do not reduce the risk entirely. In fact, new risks materialize, and these are the basis, rollover and duration risks. These risks are not nearly as large as the C-3 risk itself; however, they are not insignificant. They require a great deal of investment skill to keep them in line. The basis risk is the risk that the futures contract prices will not be in 100% correlation with the underlying hedged asset; whereas, the duration risk is the risk of yield curve changes when the duration of the hedged asset is different than that of the futures contract. The rollover risk occurs when the hedge requires you to rollover the futures contract several times during the term of the hedge. Here the risk again is that the structure of the futures prices will change adversely during the time the hedge is in place. There are other risks; however, these are the major ones.

In addition to recognition of the risks, one must also consider the accounting and income tax implications. In any event, if we continue to have volatile economic times and interest rate conditions as we have experienced recently, these future instruments will certainly prove worthwhile in controlling our C-3 risk, company profitability, and enhancing product design.

MR. JOHN D. HOGAN: The questions assigned to me are important to the practical application of the many suggestions developed by the C-3 Risk Task Force over the last two years, and I hope we can gain some insights by thinking together about investment strategy.

Tradition has a strong hold on the life insurance industry. Whole life policies, the agency system of distribution, and the "buy and hold" investment strategy are examples of practices that have become institutionalized over many years. But even institutions cease to be serviceable when environments change sufficiently. "Buy and hold" was an appropriate strategy in the early 1960's when the Moody AAA corporate bond rates changed a total of one basis point per year over five years. It is not an appropriate strategy, however, when the same bond rates change an average of 80 basis points and the GNP deflator is 7% per year, as happened in 1975-80. Back in the 1960's we had negative inflation if you take into account quality improvement which was probably at the rate of 1.5% to 2.0% in a year.

Interest rate volatility in the 1980's, accompanied at times by an inverted yield curve -- short-term rates were paying more than long-term rates -- prompted insurers to change traditional practices. Asset maturities shortened (from 1969 to 1981, the proportion of life insurance assets acquired that were short-term went from 53% up to 81%). The quality of investment has become a decision variable. We are all tempted as we find ourselves with liabilities that are locked in, promises of high rates, "put" features (the ability to sell us back the contract). We proceeded to develop different kinds of contracts that practice the problem of avoidance. We either tie them to surrender charges or we index them or match them with invested assets. It was these kind of circumstances which led to the formation of the C-3 Risk Task Force.

The investment function in many life companies has been, until recently, "an isle entire to itself." Investment officers had little truck with insurance marketing and operations and did not appear to miss the association. They mingled with their professional counterparts -- banks, brokerage firms, etc. During the last few years, this attitude has changed and the investment and marketing people (sometimes brought together through a friendly actuary) are in conversation with each other. The investment literature is replete with studies of immunization, hedging, asset-liability matching, and similar subjects often illustrated by insurance portfolio problems.

Now that these people are talking, a relevant question is when should they begin talking. Our problems would be less if they talked at the time of product development. At that point, it is very useful to have the marketing people and the investment people in dialogue with each other. Some of the warnings as to whether the product is viable in terms of the investment return assumed are more likely to be encountered and dealt with at that stage. If investment function representation is available at the product birth, the result may be a more practical design and a sense of ownership responsibility by the investment department.

The kinds of information required by the investment department to formulate investment strategy include product design characteristics (e.g., indexed, interest sensitive, interest crediting philosophy, options), and anticipated flows (e.g., premium revenue, new sales, renewal premium, partial and full surrenders and policy loans). Support of contracts requiring returns above going market interest rates can usually be accomplished for modest premiums volume if sufficient, unambiguous information is provided to the investment department.

For its part, the investment department should communicate pertinent data on investment opportunities, the depth and resiliency of fixed income, mortgage and equity markets and their probable future course. In 1980, the American General investment department developed an instrument for variable rate loans of three year's duration providing a lock-in rate and a "put" feature permitting reinvestment of the principal if the rate negotiated at the end of the three-year period proved unacceptable. The investment matched a contract sold with a policyholder "put" option at the close of three years, conditional upon the current rate being not less than the issue rate.

Communication between investment and marketing functions should be periodic -- no less frequently than quarterly. Meetings between the American General Corporation investment department and VALIC (a specialized annuity company with \$2.5 billion invested assets) are planned quarterly. Information exchanged includes the following:

- Strategy and plans
- Product review
- Competition
- Key financial data including asset-liability match
- Investment opportunities and yields
- Economic indicators
- New money rates
- Timetable and implementation procedures

The performance planning system at American General provides for quarterly updates and incorporates interest rate assumptions discussed among investment, actuarial, marketing and financial personnel. Monitoring of investment results is accomplished through internal controls and the performance planning system. Thus, internal and external sources monitor investment performance.

Motivation for development of new investment concepts -- and adaptation of not-so-new concepts -- arose from the realization that portfolios were vulnerable to swings in interest rates, and consequent disintermediation (increasing rates) or intermediation (decreasing rates). The threat was seen to be a hazard to both liquidity and surplus. Some of the adaptations such as separate accounts are well known. Complex forms of immunization and creative use of the futures market and options may be less well known.

The investment strategies capable of addressing the C-3 risk problem are of no use whatsoever unless they can be legally employed. Regulatory restrictions governing diversification of life company investments have hampered portfolio management in meeting investment income objectives. Recent developments in some stated insurance departments are, belatedly, relieving the excessive concern with C-1 risk in order to provide flexibility in dealing with the C-3 risk.

The most significant of these developments in the last month has been the provision within New York which has been submitted by the Governor. The Commission's discussion of investment regulation was music to the ears of insurance investment officers:

"...prudent investment of an insurer's assets requires adequate diversification to reduce risk, liability matching to ensure adequate funds flow, and liquidity control to provide for unanticipated change. They can be accomplished by prudent management under the supervision of the board of directors. We have found, therefore, that the present rules serve only to disadvantage both insurance companies and their policyholders by prohibiting many investments that should be permissible."

On the strength of this argument, the Commission recommended that

"...the present scheme for the regulation of insurance company investments be replaced with a set of broad limitations on particular types of investments, with which management, under supervision of the board of directors, would be free to manage investments in a manner most suitable for its company's particular requirements."

The bill is 85 pages long. Some provisions of the bill relate to our discussion today and deserve to be noted. An especially restrictive provision of the present code has been Section 80 which defines eligible reserve investments, requiring that they be interest bearing or income paying when bought. It rules out futures contracts and options. If the requirement is not fulfilled, invested assets must go in the "basket." Proposed legislation would eliminate the "basket" requirement and permit bona fide hedging transactions in foreign currency (if in connection with purchase or sale of eligible securities) and contracts for future delivery of, and options and other rights to purchase contracts for future delivery of, obligations that are eligible for investment by a New York insurance company. The contracts, options and rights must be traded on a national securities exchange or board of trade in the United States. The aggregate amount of obligations represented in the hedging transactions is subject to a limitation of 2% of the insurance company's total admitted assets. The hedge may not exceed one year and would appear to apply to all eligible investments including common stock and equities.

In addition to the 2% provision, Section 81(a) amends the "basket" provision on non-interest bearing or income producing assets which provides for a 3% admitted assets limitation. Thus, companies could purchase collectibles, gold, put and call options and similar investments.

An important new provision in the bill governs investment in and acquisition of subsidiaries. Section 46(a) permits a domestic life company to invest in, or otherwise acquire, any lawful business except banks, savings and loan associations, and federal stock savings banks. The parent company's total investments in subsidiaries must not exceed 10% of total admitted assets and not more than 2% can be in any one subsidiary. Except for the usual limitations such as investment in a corporation in which a majority of voting stock is owned by directors and the previously mentioned prohibition against owning banks, it appears that these subsidiaries can invest in almost anything they want, including futures contracts.

Finally, it is proposed that provisions governing separate accounts be amended to permit insurance companies in third party agreements, such as pension funds and trusts, to invest in any investments permitted by the agreement and restrictions in the insurance law shall not apply. If the employer or other third party endorses use of futures trading, then such investment activity would not be restricted.

If the proposed New York State bill becomes law without significant change and the Superintendent of Insurance issues appropriate regulations -- as the bill requires him to do within six months -- insurance company investment strategy would be significantly changed for New York companies.

Legislation such as New York State is considering opens up a large number of candidate investments not hitherto available to life company portfolio managers. Financial futures contracts and options are the principal investment instruments to be considered. Similar contracts have been used for many years to hedge commodity price movements. A commodity supplier who purchases a large inventory of a commodity subject to price volatility, and wants to "lock in" the margin between inventory unit cost and sales unit cost, would proceed as follows: (1) purchase the commodity; (2) sell short a futures contract equal to the physical units of the commodity which will expire when the inventory has been depleted. If the inventory unit cost declines (shrinking his margin), he compensates by buying futures contracts at the reduced price and insures his margin by the difference between his original contract price received and the price at which he is able to cover his contracts. The loss on physical inventory is offset by the gain on the futures contracts less the cost of the futures contract.

Financial futures contracts are analogous except that the hedge is against movements in financial instrument prices/yields. The most widely used financial futures contracts of interest to life companies are Treasury bond futures, sold on the Chicago Board of Trade since 1977. A hedge is simply a voluntary acceptance of a risk to try to offset a risk you encounter in your ordinary business. The futures market is a risk transferring apparatus. It takes risk that you do not want to bear and you shift them off to people in the market who take opposing views who are willing to take on those risks. The hedge vehicle, meaning whatever you choose to use as a hedge, has to have a close correlation in duration and path with the underlying securities. All models assume a given interest rate profile (yield curve). The simplest of them have a flat yield curve and a generalized model is a tricky business. Moreover it is almost always an assumption that there will be parallel movements in the underlying hedge security and in the basic cash security. The procedures are to identify the risk, look at non-hedging possibilities of shifting the risk, valuing hedging as a strategy, and selecting the hedge vehicle.

As an example, buying a Treasury bond in the cash market and simultaneously selling a futures contract "locks in" the return sought in buying the bond. If price of the contract increases, reducing yield, the futures contract price will also rise and the yield will be protected. Long-term investment positions are frequently hedged with respect to return in this fashion when sale of the underlying security would create a tax or surplus loss consideration.

The best set of policies and procedures has been developed by the Federal Home Loan Bank Board. Written policies and controls must be used. The purpose of the hedge has to be specified at the time it is implemented. The

futures position must be closed at the same time the underlying security is closed. There must be a limit on the portfolio shortening which is allowed which means you cannot use the market for speculation. A typical transaction might involve purchasing a bond and simultaneously a "put," permitting one to sell the bond at par any time over the next year. If yields increase, driving down prices, the bond can be sold at par, and the proceeds reinvested at new higher yields. You can sell the coupons off the bonds, which is allowed now, and accept the future market rate risk.

The skilled portfolio manager can, with the futures contracts and options available to him, lock in returns, alter the fundamental form of an investment asset (shorten maturity), and hedge either assets or liabilities. These contracts constitute powerful tools to cope with interest rate volatility.

Additions to the field of securities available for life company investments continue to enlarge investment opportunities. These include GNMA pass through bonds, participating mortgage bonds and zero coupon mortgage-backed bonds. An estimated 50% of mortgage financing is now accomplished through mortgage securities. Active markets exist for these securities which frequently pay rates in excess of bonds.

The traditional means of organizing an investment department is by the security type: Fixed income, equities, private placements. The temptation is to say this ought to be product driven, but if it were, you would face the necessity, because products do change, of possibly shifting the organizational format. The investment personnel will have to have more depth and more flexibility rather than less. It just isn't possible most often to take a full investment crew and put them on a given type product. So probably the best thing to do is maintain the investment specialization. Everyone is going to have to know in very skilled terms how to deal in options and futures contracts, how to evaluate risk.

Investment management in life insurance companies has seen the necessity to establish close rapport with insurance operations, especially marketing and financial planning. Inflation and interest rate volatility have combined with strong competitive pressures to force this overt liaison. As the appreciation of C-3 risk increases, the tools to cope with the risk improve and the regulatory climate grows more favorable for active portfolio management.

It would be a mistake, if, in our enthusiasm for coping with the C-3 risk, we reduced our concern with the other two (or three) risks. Safety of principal, non-interruption of income, and proper pricing are important considerations in life company management. It is possible to use the options market to price some of the strategies. For example, the ability of a policyholder to "put" his contract to the company without price risk is a valuable option. Right now if he went out into the market and asked for a 90-day out-of-the-money call to protect the company against the financial effects of the "put," it would be priced at 4-6%.

MR. ROGER F. HARBIN: My comments today will focus on the practical aspects of product design and its relationship to the disintermediation problem in insurance contracts. I will cover the following general topics:

- Controlling the liquidity risk in fixed dollar contracts;

- The role of indexing, load charges and surrender charges;
- The role of the agent and the effect of the commission structure on persistency;
- The shifting of risks to the policyholder.

Some companies make a conscientious effort to keep their policyholders informed of the value of their contracts. A properly devised program should have a positive effect on persistency. For example, a company may wish to periodically send to the policyholder a schedule of future premiums compared to the build-up of contract values. This would tend to emphasize that much of the acquisition cost in a policy has already been borne and that future net costs of the policy are low or negative. A few companies have excellent records of developing policyholder loyalty and confidence in the company, which is evident in their persistency figures. We should and will see more use of annual reports to policyholders as both an informing tool and a persistency tool.

The company should make reasonable attempts to upgrade the value of older policies. Each company will have to decide what its exposure is, what cost it is willing to bear, and what likely effect on persistency will be achieved. In many cases the decision will be to do nothing, but this should be an active choice, not a passive one. A few articles have already been published on upgrade programs, and I would encourage any company which undertakes such a program to share its results.

The company should avoid whenever possible creating concentrations of persistency exposure. This is one of the most overlooked risks that face any insurance company. These are usually the result of the desire to produce large volumes of business through a small number of agencies or distribution sources, thereby reducing acquisition expenses — at least in theory. Concentrations of mortality exposure are controlled through reinsurance and underwriting, but many situations of severe persistency exposure currently exist which do not receive similar attention.

The company should make reasonable and appropriate charges for surrenders or policy loans. Legislation permitting the use of variable policy loan rates is now in force in the majority of jurisdictions, and consideration should be given to implementing it. Of course, the usual questions of new business versus old, and equity among classes of policyholders must be addressed.

In the case of non-par contracts, if existing in-force policyholders are asked to accept higher loan interest rates, some off-setting benefit for accepting that change must be offered.

For participating contracts, a change to a higher policy loan interest rate usually involves segregating a class of issues into those who accept the change and those who don't. Criticisms have been raised against this, primarily the notion of "changing the rules after the game is already under way." The real choice might be between changing the rules or not having any "game" to play at all.

Companies should evolve toward products that recognize current experience and can adjust from time to time as that experience emerges. The number of



fixed value annuity contracts currently being sold has declined very rapidly. It can be anticipated that the sale of fixed dollar life insurance contracts will follow the same path.

Contracts may use a number of features to keep up with current experience. These might include changing the interest rate at which values accumulate, changing the rates at which charges are deducted from the policy for various insurance benefits or expense loadings, or changing the rates charged for policy loans. The ultimate would be variable account based values, but most companies are not prepared to bear the expense of SEC registration. Perhaps the insurance industry ought to work with the SEC to explore some new middle ground on the issue of regulation of insurance products.

One technique for adjusting policy values or charges is to tie the amount of the item to some sort of external index. Some universal life insurance policies are indexed to treasury bill rates, as an example. Also, current policy loan interest rates may be indexed, or implicitly adjusted through the crediting of lower rates on loaned values, or the use of lower rates in dividend formulae.

It is also possible to index policy fees or expense loads that are charged on an annual basis so that they might increase during times of rapid inflation.

Indexing has several clear advantages apart from tax considerations which may have prompted the original indexing concepts. Current experience is recognized explicitly; policyholders have an external source for determining rates that will be used in their contracts, and management is relieved of the duty of periodically debating upon those rates. Also, at least one insurance consumers' group has endorsed the concept of indexing, although it is not clear whether that is because of informed preference or distrust of insurance companies.

There are several negatives to indexing. Indexing any policy value merely creates a new type of guarantee which, although not fixed, must nevertheless be met. Many policies which credit current interest rates on the cash value are indexed to short-term rates. This requires investing assets in short-term instruments to match those guarantees. In times of inverted yield curves, this presents no problem, but as yield curves revert to normal, the pressure to begin crediting rates higher than the index will mount. Many companies whose products are indexed are now paying rates above the levels of their index. If the earnings to pay those rates are being achieved through mismatched investing, then the old problems will just resurface in a new form.

Another area which ought to be examined is that of policy loadings, either back-end or front-end. In the case of back-end loads, the problem is to assure that they are adequately disclosed so that when it comes time to collect, there is no question of misrepresentation sufficient to require waiver. Also, it is generally not possible to recover more than the cost of acquisition through surrender charges. Any market value loss potential must be otherwise dealt with.

Assuming those difficulties are overcome, there is some appeal to surrender charges in that persisting policyholders are not made to pay for the costs of lapsing policyholders, thereby receiving more value for having persisted.

In the case of front-end loads, there should be less question about disclosure. It is still possible with a front-end load to couch it in such a way that it is

not obvious to the policyholder. I have noted a recent trend in universal life product design away from the explicit disclosure of loadings. This makes it easier to increase agent compensation without raising the issue of its magnitude. It may also lead to eventual public and regulatory disenchantment with a product that was supposed to be the ultimate for the consumer.

Assuming that loads are explicitly disclosed, there is a potential marketing disadvantage in that the agent must work harder to sell the prospective customer on the value of the policy. The advantage is that once it is sold, it is more likely that the policyholder understands what has been purchased and sees it as being of enough value to have done so, and therefore retain it.

Without doubt some of the liquidity problems of companies can be traced to agent activities. For many years the insurance agents of this country have served the public very well. Today many of the forces acting upon agents are the result of economic conditions, and some are the result of fuzzy thinking on the part of insurance companies. It is a lamentable fact that certain products, such as select and ultimate term insurance, by their design encourage poor persistency. Agents are motivated to cause the lapsing of such policies for several reasons, among them:

1. Replacement results in a new first year commission. This can be very important in times of declining rates and commission scales.
2. For a select and ultimate term product, the agent is doing the policyholder a service in securing the lowest possible rate in any given year.
3. Because the premium in renewal years is higher than for new policyholders at the same attained age, the agent must rewrite the policy to prevent a competing agent from replacing it first.

While this product does not itself pose a disintermediation problem, it does raise serious questions about our ability or willingness to predict agent behavior and design products appropriately. The most serious implication is that of disposable insurance. We have begun to change our attitude in the industry and in the mind of agents about replacement. It is no longer reprehensible -- it has become a common practice. Unfortunately, it may be impossible for companies to sell at a profit some insurance products through current distribution channels with the kinds of persistency rate being experienced.

A number of solutions have been attempted for this problem. A few companies, for at least a few products, have moved toward leveled commission scales. In addition, a few companies are attempting to implement fee-for-service structures with the sale of associated no-load insurance products.

When designing any product, it is essential to anticipate its impact on the distribution system. A properly designed product will be good for the customer, the company, and the agent, and will invite good persistency.

The final area I would like to discuss is the shifting of risks to the buyers of insurance products. Policyholders today are demanding more value in their contracts. It is unreasonable and impossible to provide it without the transfer of some investment risk. This is accomplished entirely with variable account based products, partially with universal life and with participating contracts.

Investment risk can also be transferred through market value adjustments. Again, these probably cannot accomplish the entire need. Most market value adjustments are calculated over a relatively short period of time such as one to five years, matching the remainder of the interest guarantee period. It is possible that these will have insufficient impact if the company has not adequately matched its assets to its liabilities.

Another area of risk shifting is that of mortality. Examples are indeterminant premium products, participating contracts, or universal life, where the mortality rates can be changed. This is also a feature of re-entry term insurance in which failure to re-qualify can result in a change in classification for the charging of the stated maximum rate scale. It should be an obligation for companies and agents to disclose adequately such risks by equally prominent display of worst case situations with current price situations.

Not to be overlooked is our old nemesis, persistency. The risk of lapsation can be in part shifted to the policyholder by charging of front-end loads so that the recovery of acquisition costs is accelerated. This is effectively done in most permanent products and should be encouraged in term insurance. A select and ultimate term policy could be profitable if an initial policy fee were included in a size sufficient to cover most acquisition costs. It would not be easy from a marketing standpoint, however.

I do not think it is an overstatement to say that the problem of poor persistency is the most challenging one facing us. One industry leader recently remarked that we must get back to selling insurance based on life expectancy instead of lapse expectancy. Poor persistency manifests itself in degraded mortality, expense overruns, and investment losses. Therefore, it is incumbent upon us as designers of products to anticipate and control lapse problems.

MR. ROLAND DIETER: In the flexible premium arena, I have been to several presentations of the Society functions, and they keep talking about futures as opposed to options to take care of the risk of the rates changing. If the rates are not going to change, obviously, it does not matter what option you go with (option or future). If the rates go up, you don't need to have anything. You are only worrying about rates going down. As such, what would a futures contract do for you?

MR. HOGAN: The primary concern with the rate rise, if you are fixed into a given portfolio, of course, is in the decline in market value securities. An appropriate use of futures is to try to hedge against that if you can anticipate it. I am looking now at balance sheet effects with respect to this.

MR. DIETER: What I meant was you are giving interest guarantees for a year going forward on premiums you have yet to receive. In giving that guarantee going forward to the end of the policy year, you don't know at what rate you are going to be able to invest. So by making the guarantee up front, you want assurances that you can go out and buy something. So, if the rates are going to go up, a futures contract is going to deflate in value, which means a loss. Aren't you only concerned with rates falling?

MR. HOGAN: I think we are concerned with volatility in either direction. A lot hinges on the character of the contract. With respect to the flexible premium case that you are mentioning, where this is a sporadic operation, most often you have an inflow of cash which you have to cover for some period of time. It seems to me, almost an ideal situation to hedge with a use of the future if you are doing it continuously.

MR. GIRARD: It depends on the situation you are in if you want to go long in the futures market. If, for example, you are making a guarantee on the next twelve months of deposits on a guaranteed investment contract and you want to hedge against that, you will want to go short. You may be in a situation, for example, where your liability is very short (three-year mean duration), but you can only invest in assets that have 10-year terms or 6-7 year mean durations. What you can do is sell futures to shorten the duration of your assets. So there is a situation where you want to sell and there are situations where you want to buy. Both types of positions are useful.

## Exhibit A

- Apache Electronic Systems - Mini Max
  - Oakbrook, Illinois
  - Microcomputer based ALMS
  - \$2,000 to \$8,000
  - Five users
  
- Control Data Business Information Services  
Asset/Liability Management System
  - New timesharing product, flexible software
  - Some aspects available/to be available on IBM PC
  - Comprehensive portfolio management, balance sheet management and "what if" capabilities
  - Access to other data bases
  - Ability to customize, including integration with hedge management
  - Cost based upon usage, storage
  
- Financial Technology, Inc.  
Asset-Liability Management -- Financial Planning System
  - Chicago
  - User defined categories, 13-month horizon
  - Apple II Plus or IBM PC
  - \$5,000 lease plus maintenance
  - Twenty-six users
  
- Financial Management Services, Inc.  
A/L Analysis and Maturity System
  - Overland Park, Kansas
  - Provides gap and net interest margin analyses
  - "What if" capabilities
  - Uses a CP/M microcomputer
  - \$3,500 direct sale
  - Twenty users
  
- The Fund Management Group  
Funds Allocation System
  - New York City
  - A comprehensive model for optimizing after-tax net income
  - Professional assistance provided to develop model
  - IBM mainframe version for \$50,000 plus timesharing use
  - Twenty users

## Exhibit A (Continued)

- Northridge Software  
Asset-Liability Management
  - Freeport, Illinois
  - Pro forma spreadsheet model with gap analysis
  - Commodore microcomputer
  - \$975 direct sale
  
- Olson Research Associates, Inc.  
The Financial Planning System
  - Greenbelt, Maryland
  - A comprehensive corporate planning model with standard and customized versions and consulting services for implementation and education
  - IBM mainframe version for \$20,000-\$60,000 or timesharing version for \$18,000-\$20,000 lease plus monthly charges
  - A separate hedging control system is available for an IBM PC for a lease fee of \$20,000 plus \$100/month
  - Four hundred FPS users
  
- Plansmith Corporation  
Profit Planning and Asset/liability Management System
  - Palatine, Illinois
  - A microcomputer based system for CP/M machines and the IBM PC
  - Features a monthly maturity ladder
  - Consultation services available
  - \$4,000-\$9,000 plus \$500/year
  - Two hundred fifty users
  
- Gary Robben & Associates, Inc.  
Asset/Liability Monitor
  - Merriam, Kansas
  - Features daily, weekly, monthly and long-term ALM reports
  - "What if" capabilities provided by two VISICALC models
  - IBM PC
  - \$5,000 plus training
  - Two hundred users
  
- Saddlebrook  
Financial Planning and Control System
  - Oakbrook, Illinois
  - A full financial system which includes ALM features
  - \$80,000-\$200,000 full system including DEC minicomputer
  - Two hundred seventy-five users

## Exhibit A (Continued)

- SEBANC  
Spread Management/Asset Liability Management
  - Decatur, Georgia
  - Microcomputer based spread analysis and planning system
  - Part of the Microcomputer Management System which includes funds management, marketing and other subsystems
  - \$29,900 for integrated package, includes Dynabyte microcomputer
  - Ten users
  
- Sendero Corporation (Formerly Capex Corp.)  
Financial Results Simulator
  - Phoenix, Arizona
  - Financial modeling system with monthly timeframes which provide dynamic and static gap analyses
  - Available on IBM, Hewlett Packard and IBM PC (new)
  - Mainframe version \$9,000 plus modeling language, microcomputer version \$3,500-\$11,500
  - Seventy-five users
  
- Strategic Information (Ziff-Davis Publishing Division)  
TABS - The Analytical Banking Service  
TAB\_M - The Advanced Balancesheet Manager
  - TABS is a financial modeling system (monthly timeframe) which is available on timesharing, DEC minicomputers and microcomputers
  - TAB\_M is an ALM modeling system with daily gap monitoring capabilities and simulation capabilities. The system is available on timesharing or on a DEC minicomputer
  - TAB\_M minicomputer version lease fee \$20,000-\$180,000 with the higher fee including the minicomputer
  - Fifty users (combination), mostly timesharing
  
- Union Planters National Bank  
PROPHET Asset/Liability Management System
  - Memphis, Tennessee
  - ALM simulation models which run on Apple II Plus and CP/M based microcomputers
  - Separate versions of the model are available for banks and savings and loan institutions
  - The models provide pro formas based upon monthly periods as well as gap analyses for 30, 90, 180, 360 days and longer periods
  - Separate consulting services offered
  - \$7,500 lease fee includes on-site training
  - Three hundred users

## Exhibit A (Continued)

- Wachovia Bank and Trust  
Profit Planning System and Sensitivity Analysis System
  - Winston-Salem, North Carolina
  - Profit planning model provides monthly, yearly and five-year horizons for pro forma financials
  - Sensitivity analysis model provides maturity structure, rate analysis and reinvestment analysis reports
  - Consulting services provided to banks since 1972
  - Systems are available on timesharing or on an IBM PC
  - \$14,000-\$20,000 for IBM PC version; includes three days' consulting and depends on location
  - Thirty-seven users