

RECORD OF SOCIETY OF ACTUARIES 1976 VOL. 2 NO. 3

PENSION FUNDING VEHICLES

Moderator: THOMAS H. JOLLS, JR.

Panelists: YUAN CHANG, RAYMOND E. PINCZKOWSKI, JR.

1. Choice of Vehicle - Individual Policy, Deposit Administration, IPG, Self-funding and Split-funding -
Considerations:
 - a. Size of plan
 - b. Actuarial questions
 - c. Level of investment return
 - d. Expenses
 - e. Type of employer
 - f. Existing plan versus new plan
 - g. Considerations in changing agencies.
2. Investment Mix
 - a. What approaches are being taken to decide on mix
 - b. Extent of actuarial involvement
 - c. Effect of plan features on mix.
3. Insurance Company versus Corporate Trustee (Banks) and outside investment advisers
 - a. Fixed Income Investments
 - b. Equity Investments
 - c. Special guaranteed principal and interest vehicle for either defined benefit or defined contribution (including Thrift and Profit-Sharing) plans.
4. Approaches to plan termination
 - a. PBGC influence
 - b. Annuity purchases
 - c. Other alternatives.
5. Small plans - Approaches to minimize expenses in light of ERISA.

MR. THOMAS H. JOLLS, JR.: Pension funding is a subject which occupies much of the time of an increasing number of the members of our profession. It has become a major economic factor. A survey of 100 companies by one firm showed that the 1975 pension expense exceeded the 1974 pension expense by 22%. The survey also pointed out that the 1974 pension expense represented a 26% increase over 1973 pension expense. Thus, the two year growth in pension expense for these 100 selected large companies exceeded 50%. At the end of 1975, private and public pension funds reached the \$400 billion mark, with about 53% of the total in the private sector.

All of you are familiar to some extent with ERISA, the Employee Retirement Income Security Act of 1974. This act has had, and will continue to have, an impact on pension funding vehicles. ERISA governs the rate of funding; but, more importantly, it confers fiduciary responsibility on those responsible for selecting the funding vehicle.

The last few years have witnessed a change in the movement of pension funds and in the selection of funding vehicles. The trend toward the use of money managers who are not banks or insurance companies was just beginning prior to 1970. This trend has accelerated since 1970. There has also been a trend toward multiple funding vehicles. The stock market decline of 1973 and 1974 has had a profound impact on the opinions and attitudes of plan sponsors and caused many of them to give searching reexamination of the funding vehicles used for their plans.

Finally, there is a growing public awareness of the importance of pensions and pension funding. ERISA is a manifestation of that public awareness. A newer manifestation is the forthcoming book, "How Pension Fund Socialism Came to America", by Peter Drucker, a well-known management writer. The thesis of this book is a provocative one. It is, in effect, that pension fund beneficiaries indirectly own approximately 30% of the equity capital in the U.S. and that this percentage is expected to grow to 50%. Although nominal ownership is concentrated in financial institutions, the real owners (employees and pensioners) are far removed from the actual management of productive enterprise. Mr. Drucker suggests that this invites increasing encroachment by the political sector on the activity of business management.

In these circumstances it behooves sellers and buyers of pension funding vehicles to examine the alternatives open to them. Our topic today is pension funding vehicles. Yuan Chang will discuss pension funding vehicles provided by the insurance industry. Ray Pinczkowski will discuss the combination of funding vehicles used by his company, International Harvester, and describe the investment policy planning that they have done for their retirement program.

MR. YUAN CHANG: In the past decade or so, the once-sharp distinction between insured pension plans and non-insured pension plans has greatly diminished. Now, it is perhaps more meaningful to discuss a spectrum rather than a dichotomy. Beginning with plan design, a pension plan requires various types of services and involves various kinds of risks. Some or all of the services and some or most of the risks may be passed on to an insurance carrier. While many plans do not involve an insurance company, many others do, to one degree or another. Any such involvement may permit a plan to be classified as split-funding. "Split-Funding" has become such a broad term that it has definitely lost some of its usefulness. For the purpose of this discussion, let me simply address myself to the subject of participation by the insurance industry in the multi-billion dollar process of establishing and maintaining pension plans.

At the risk of boring most of you in the audience, I would like to begin with some elementary concepts. The purpose of a pension plan is to provide retirement benefits. To avoid passing the financial burden on to future generations, one expenses regular amounts against current income and accumulates such amounts in a fund. This fund, together with investment income, is to provide benefit payments to retirees. For each participant, during the fund accumulation stage, someone must manage the fund for optimum investment income. During the payout period, someone must send out the payment checks and manage the remaining fund, again for optimum investment income. An insurance company participates in this process by offering a variety of products.

In earlier days, pensions might be funded by the purchase of retirement income policies, where the monthly income at retirement may be 1% to 2% of the face amount of the policy, or by the purchase of some other form of endowment policies. It is still a common practice to fund with relatively high cash value ordinary life policies (when pre-retirement death benefits are desired) along with an auxiliary fund. Most of the risks are transferred to the insurance company and most of the services are performed by the insurance company. At retirement, annuities are purchased to provide the regular benefits, risk-free to the plan sponsor. Likewise, deferred annuities, on both individual and group basis, had been popular at one time. All of these products were offered based on relatively conservative mortality assumptions and what might have been considered relatively conservative expense assumptions. Investment income assumptions were consistent with the expected earnings of the company's general portfolio. For the sponsors of small plans, the foregoing types of funding are convenient. The expense is relatively high, but probably no higher than any other way of funding small plans. However, there are certain rigidities attached to them. They are cumbersome to work with, particularly for benefits based on final average salary.

Then came the development of the deposit administration contract, primarily a Group product. Where the Individual side is concerned, more and more emphasis is placed on auxiliary funds to the extent that such funds may be considered small DA's. DA's involve the buildup of a fund deposited with an insurance company. The deposits are based on contribution amounts that are determined each year by the use of some funding method and consist of usually the normal cost plus some amortization of the past service cost. The fund is not allocated to active lives prior to retirement. At retirement, annuities are purchased at guaranteed premium rates.

It is necessary to briefly discuss the investment year method of allocating investment income to these funds before we proceed. Each year, money deposited is aggregated by the insurance company for investment, generally in fixed income securities. The total income from all investments in the year related to the weighted exposure of the total investment in the year produces a rate of return known as the new money rate. Any investment in the next year from this compartment is normally considered new money

in that year. However, depending on the method used, any pay-back in principal may either be reinvested and included in the original compartment or rolled over into the new money compartment, in which case this original compartment would continue to decline in size until everything is rolled over in a period of 20 to 25 years, or even 30 years. In either case, the rates for every calendar year compartment since adoption of the investment year method (some aggregation may be done for earlier years) is determined at the end of each calendar year.

Returning to the DA contract, funds are generally credited with a guaranteed rate of return, which now may be as high as 9 or 9 1/4% for new money, and debited any annuity purchases and a contract charge that varies according to size and sometimes to renewal year. Retired lives are valued at statutory levels. The total fund is then compared to this experience fund that is developed by accumulating the entire fund, active fund as well as retired fund, at respective compartment rates applied to the funds in each compartment. Funds in each compartment for a specific case are developed in exactly the manner as the development of funds in each compartment for the general portfolio. Expense charges are made and benefit payments are deducted. The comparison normally produces a rating margin, from which the insurance companies may declare a rate credit, which in turn is treated as if it were a new deposit in the year the rate credit is declared.

What are the expense charges? The practice differs from company to company. In general, there are a number of parameters. They include per active-life charges, per retired-life charges, premium tax, FIT if any, contract and extra accounts charges, separate account charges if that's involved, graded fund charges, and nominal service charges that constitute the company profit. For small cases, say 50 lives or so or \$25,000 annual deposit, the first year cost may be \$1,000 to \$1,500, not including charges for valuation; for renewal years, less. For large cases, the absolute cost could be significantly higher; but the percentage costs as related to annual deposit or to the total fund are significantly lower, as would be expected.

DA is a flexible product and is offered to cases with as low as 10 lives. At the low end, it is generally programmed, so that there would not be a proliferation of tailor-made plans and benefit formulas, in order to reduce the cost of administration, while for medium and large size cases it is possible that some companies will underwrite a DA contract that represents only part of a plan's fund. Such an arrangement is not normally acceptable in the case involving a small number of lives. For the plan sponsor, risks associated with retired lives is partially transferred to the insurance company. To the extent that actual experience deviates unfavorably from premium rate assumptions, the experience rating margin suffers first. If the margin is exhausted, then the carrier takes the loss. In case of discontinuance of the active life fund, funds are generally converted to the market value to reflect different interest rate levels in the respective calendar year of deposits and discontinuance. More and more, and perhaps now most, dis-

continuance provisions involve an installment payout of book value over 5 years or more, with funds accumulating interest at a relatively low interest rate during discontinuance. The capital risk is thus partially transferred to the insurance carrier. The product is designed for ongoing plans, not for plans which desire frequent change of funding agencies. For plans of medium and large size, pooled and individual separate accounts are available as complementary investment media. Separate Accounts will be discussed later.

For large and very large plans, self-insured plans using insurance companies as funding agencies are in the form of IPG, immediate participation guarantee, contracts, sometimes known as direct rating deposit administration or DRDA. The features are almost the same as those of DA's, with one important distinction. Deposit funds are maintained by calendar year compartment and investment income is credited directly at the applicable compartment rate. All expenses are taken out directly and all benefit payout deducted. A running account is thus maintained with no concept of margin or rate credits. Annuities are still "purchased" at retirement. Retirement benefits in force are valued at statutory levels, and the amount of such reserves represent the restricted part of the total fund. The restricted part of the fund is not free for transfer to other agencies, although from time to time, special negotiation is possible. Funds at discontinuance are transferred at market value, or at book on installment basis. Expense structure and level are similar to that of DA's, except that the service charge may be lower to reflect reduced risk on the part of the carrier. A number of companies also provide the alternative of a fee schedule based on the amount of the deposit fund. Such a fee schedule normally reproduces the corresponding total expenses derived from a multi-parameter expense structure. There is also current market pressure for a minimum interest guarantee. Such guarantees are at such levels that they may very well breach the barrier of being risk-free to the carrier. A higher service charge may be appropriate for taking on such a risk. Again, separate accounts are available.

Turning to separate accounts, this is where the insurance companies, as funding agencies, provide investment media other than fixed income securities. For equity investments there are always available individual separate accounts for larger cases. There are also several pooled separate accounts that may be considered on a par with income or balanced mutual funds. It is also possible to have growth-oriented separate accounts, although for many pension funds questions of propriety could be raised. Other separate accounts are designed specifically for variable annuities. The newest orientation to equities being discussed is option funds where options are written against equity positions in the portfolio.

Although separate accounts were originally conceived as an insurance company's vehicle for investing clients' funds in equities, over the years the number and type of other kinds of separate accounts have proliferated. Most notable is the real estate separate account. Some deal specifically in

mortgages, first, second, wrap-around, etc.; others deal with equities in real estate. As investment media for pension funds, real estate equity ownership may still be considered virgin territory. There are other types of separate accounts which in a large way overlap with the insurance company's general portfolio in terms of type of investments. Bond separate accounts are coming on line, both in the public securities sector and in the private placement arena. Short-term papers, treasury bills, and commercial papers have also become investment targets of separate accounts. Often this vehicle might be used as a temporary parking lot for funds.

Different types of separate accounts involve different investment fees, normally charged against the fund, although they can be paid separately. Pooled accounts may involve 1/4% to 1/2% of the fund. Individual accounts have fee structures, generally graded in favor of large accounts. As opposed to pooled accounts, the fee is generally higher at the low end, but lower at the high end. The breakeven point may very well be around \$15 or \$20 million dollars. Of course, the clients have much more influence on individual separate accounts than on pooled accounts. On the other hand, the portfolio cannot be as diversified for the former as for the latter. But then again, investment managers cannot be as nimble with a large pooled account as he can with relatively smaller individual accounts. Then again. . . .

In any case, the operations of several factors such as state regulations, IRS code, the purpose of separate accounts, etc., pretty much resulted in a common thread running through all these separate accounts. That is, except for the investment fees, the pension fund gets what its investment makes - investment income, capital gains, and capital losses. The entire investment risk is on the client. There is no guarantee of investment return or, for that matter, the principal. There is always an exception to the rule, a separate account currently filed for approval by one of the major pension writers provides just that. Furthermore, if that's approved, I venture to guess that it may prove to be the rule, rather than an exception.

I shall briefly touch on two other products before we turn to the burning issue of the guaranteed fixed income contracts. Plan sponsors may choose to invest on their own or use other funding agencies for the accumulation of funds and then purchase an annuity for a participant as the latter reaches retirement. This is commonly known as terminal funding (we changed the name to Guaranteed Monthly Income for obvious reasons). Contracts may be written individually with plan sponsors. There can also be several insurance companies involved, competing for each retired life, almost entirely on rate bases. There are also master contracts issued to brokerage houses and consultants, who in effect serve as a clearing house of competing rates among a number of insurers for many plans. There is no need to describe the annuities in detail. They are plain old annuities of the common forms, both deferred and immediate. Premium rate assumptions are generally based on company experience. Most companies use new

money rates as a starting point, backing off for obvious actuarial reasons and sometimes other reasons of their own. Companies also have been known to use expected spot rates as a starting point. Expenses may run 2% or 3% without commission and premium tax. Commissions are paid depending on the source of the business.

If terminal funding may be considered retail, then closeout is the wholesale end of the same business. Plans may terminate due to merger, acquisition, or some other reasons. Instead of trying to dovetail one plan into another, it often serves the purpose better to simply terminate a plan and buy a closeout contract. All the plan's liability would be transferred to an insurance carrier as a single premium. Normally, plan assets are in excess of plan liability. There was also a curious phenomenon in this market a year or so ago. Because of the large losses suffered through equity investment and with valuation interest assumption at 5% or 6%, large actuarial losses began to show up for many plans. One way to avoid the bad show is to transfer the accrued liability to an insurance carrier at a single premium based on most favorable spot interest rate assumptions. The difference between the single premium and the liability determined by valuation is often large enough to cover the asset deterioration. It may be a once-in-a-lifetime phenomenon. Then again, it may happen again at the end of the next downturn of the stock market cycles. Expenses on these contracts vary considerably by size. All the risks are transferred to the carrier, except for the adequacy of benefit.

Because of the high statutory requirement relative to the single premium charge, all writers of the foregoing two products have been experiencing significant drain on surplus, particularly since much was written in the last two or three years. As a result, the market is drying up rapidly. Unless there is statutory relief, this market may be rather sporadic in the future.

Now we get to the so-called Guaranteed Fixed Income contracts that trade journals and general publications have been talking so much about. It really is a very simple contract. A deposit is made. At the end of five years, say, the deposit may be withdrawn together with, say, 9% per annum return compounded annually. That's all there is to it. In addition, if annuities are purchased, the rates are guaranteed for anywhere between one to five years. No expense is charged - it's all in the guaranteed interest rate.

Of course, there are a number of variations to this basic theme. Each is designed to suit the particular set of circumstances. Anyone interested in using this product as an investment vehicle must understand it as such. For example, premature withdrawals generally carry a market value penalty. Anyone who has an emerging liability problem probably should not consider this vehicle appropriate for the total fund. Likewise, anyone who wants to outguess the financial market may feel tied down as interest rates begin to move up. Yet he must consider the fact that had he been in

a normal debt security, there is also a heavy market value penalty when he wishes to take advantage of high interest rates. At least with the Guaranteed Fixed Income contract, he can recover his full principal at the end of a stated time.

The variations are numerous. In general, the basic contract may be coupled with the right to make renewal deposits in limited or unlimited amounts, so long as the cash is generated through the normal operations of the underlying plan. On the other side of the coin, the basic contract may contain a payout schedule of interest income, or interest plus a percent of the principal, or simply equal annual installments, all at book value. All contracts have attached annuity purchase rate guarantees. Some contracts have built-in provisions of ratcheting up the interest guarantee if the financial market provides a particular kind of environment, which of course has to be carefully defined. There are also contracts that provide pseudo-guarantees of principal, such as, at the end of the stated time, a new interest guarantee would be offered. If the new guarantee is lower than the old, the contract holder has a right to take the book value of his accumulated fund. But if the new guarantee is higher than the old, then the contract holder may either accept the guarantee and renew or he gets out with a market value penalty. Presumably this can go on ad infinitum. But note that even his pseudo-guarantee leaves the insurer with some capital market risk. Just visualize when a new guarantee is being offered for the third time.

Interestingly, this contract opens up a myriad of actuarial considerations that provide the kind of intellectual exercises that I dare say many of us have not seen for a long time, at least in our professional life. First, there is the question of pricing. Sophisticated and not so sophisticated models have been built to evaluate the risk and to properly reflect such risk in determining interest guarantees. Because of the capital market risk at payout, what might be considered an appropriate GAAP Reserve? We know what the statutory reserve should be. It is what the regulators say it is. As a matter of fact, the New York Insurance Department agreed with the industry that interest assumptions for statutory valuation purposes should reflect the current financial market at the time of issue. An Industry Advisory Committee has worked with the Department on these matters, which resulted in the temporary regulations promulgated in 1975, which may also hold for 1976 as well. The Committee's work continues. The Department has been most cooperative in working out this matter.

I can go on discussing the many challenges this contract presents. Yet it is truly simple from the point of view of the investor. There are no disadvantages to him if his requirement is to get a relatively high investment return on a guaranteed basis, and principal returned to him intact according to his schedule. The only question he needs to ask is whether the company will be solvent when the scheduled payment is due. That question, it seems to me, he must ask anyone to whom he entrusts funds, regardless of the investment vehicle, that is, if he wants his money back.

Here they are, all laid out in front of you; perhaps not in the kind of detail you want. For that, ask for a proposal. I have not had time to cover the products for Profit-Sharing plans, Thrift plans, and other forms of money accumulation plans. Perhaps that can be left to the question and answer period. Certainly with the array of products insurance companies offer, it seems unnecessary to go anywhere else (that's for emphasis, not a commercial). Pension writers have indeed become department stores. Now they may be anxious to tell you what to buy and in what quantity.

MR. RAYMOND E. PINCZKOWSKI, JR.: I would like to talk to you for a few minutes about the approach to funding vehicles and investment mix that International Harvester Company has taken.

In the broad sense, I would classify International Harvester Company's pension funding as corporate trustee, although as I will indicate later, we do make substantial use of various types of insurance company products.

First, let me try to eliminate any potential semantic problems between us. By a corporate trustee approach, I refer to an arrangement whereby a professional trustee, i. e., a bank or trust company, is the principal agent for the two key cash aspects of pension funds: investments and benefit payments. Primary alternatives are the insurance industry and/or individual trustees, such as company officers.

By this definition of a corporate trustee approach, I do not mean to preclude any contributions by other parties in the investment aspect, and in fact at International Harvester Company, for example, we utilize the services of banks, trust companies, investment advisers, and insurance companies. Perhaps the distinguishing characteristic of my corporate trustee definition is that the principal focus is on the corporate trustee as opposed to the alternatives. Thus, if an insurance company contract (with genuine insurance characteristics) is held for the pension plan, it is either held by the corporate trustee on behalf of the pension plan rather than being issued to the employer company or to the plan itself, or is held by the employer company incidental to the trustee funds, but in either case, the insurance element is secondary to the focus on the corporate trustee.

The corporate trustee approach is neither new nor unique. In fact, it developed back in the late 1940's and early 1950's when substantial gains in the post-World War II stock market seemed certain and too good to pass up, and interest rates on new money investments looked a lot better than the insurance industry's averaged rates that included some of the lowest coupon bonds in our country's history.

The corporate trustee approach, in my observation, is currently the most widely utilized pension funding vehicle, especially if our measurement is number of employees covered or dollar amount of pension plan assets.

At International Harvester Company we have developed a so-called "Master-Trust" with one corporate trustee. This "Master-Trust" is designed to pool the assets of several pension plans covering various International Harvester employee groups, divisions, and subsidiaries. The pooling is for investment purposes only, records being kept so that the aggregate asset pool can always be split into its component parts to satisfy IRS requirements of separate and distinguishable assets for separate and distinguishable plans. By pooling for investment purposes, we hope to accomplish several objectives: lower total investment expenses, minimize necessary cash holdings, permit utilization of larger and less liquid investments (such as real estate) than would be possible for any one smaller fund, and the other standard advantages usually attributed to larger pools of funds. But perhaps the two most important objectives sought are: first, a uniformity of investment results among similar plans of a single employer-company, and, secondly, a commingled investment fund - mutual fund, perhaps - where International Harvester Company can substantially determine the composition of the investment portfolio and any changes therein in a timely manner.

At International Harvester Company we operate our "Master-Trust" alongside a conventional deferred annuity contract that dates back to the 1930's, which is not receiving any current contributions but is still a substantial proportion of our total pension funds. We also have a companion garden-variety Deposit Administration contract which is not very large.

But returning to our "Master-Trust" for a moment, our arrangement with the Master-Trustee and insurance companies enables us to pay all regular monthly benefits to participants of all plans in a single check to a participant. All benefits from the "Master-Trust", insurance company annuity payments, and direct payments by the Company are made to a designated checking account with the Master-Trustee, rather than directly to participants. Thus, if a retired employee is entitled to benefits from more than one plan, or to an annuity plus an "uninsured" benefit, which is the typical case, the separate benefits are combined in a single check with an itemization of the components on an accompanying stub to the payee.

Our only exception is for refunds of employee contributions with interest on employee termination, which are disbursed through a separate corporate trustee to facilitate accounting for the distinction in benefit payment types.

On the investment side - the other cash aspect of our pension funds - we utilize, in addition to the conventional deferred annuity and Deposit Administration contracts, several investment advisers with particular areas of expertise in order to accomplish our desired diversity and mix of investments. In particular, our Master-Trustee runs - i. e., provides the investment advice for - three separate pieces of our pension fund: an equities piece, a fixed income piece, and a short-term cash-equivalent piece. Our Master-Trustee also performs the custodial function for seven other pieces of our pension fund, the investment management of which is turned over to outside investment advisers.

Our Master-Trustee is also the contract holder for investment-only types of contracts with insurance companies, including guaranteed rates of return for specified periods as well as equity-type investments in real estate, for example.

Beyond the Master-Trustee, International Harvester Company utilizes four other corporate trustees for their particular expertise in selected types of investments, one of which also pays the refunds of employee contributions with interest to terminating employees that I mentioned earlier.

International Harvester Company has developed its present approach to pension funding vehicles over the last 15 to 20 years, and is constantly reviewing, often with the help of outside counsel, the performance of its existing pension fund advisers as well as new and alternative investment funding vehicles.

One aspect of this process that I as an actuary have participated in may be of interest to you. Its roots are in this continuing re-assessment and investigative posture of International Harvester Company that I have described and has been most recently stimulated by ERISA. Section 404(a)(1) of ERISA requires that the pension plan administrator invest the fund according to the "prudent-expert" rule:

"With the care, skill, prudence, and diligence under the circumstances then prevailing that a prudent man acting in a like capacity and familiar with such matters would use in the conduct of an enterprise of a like character and with like aims;" and "by diversifying the investments of the plan so as to minimize the risk of large losses, unless under the circumstances it is clearly prudent not to do so."

Now I believe that most pension plan administrators have long satisfied the spirit of that requirement, even though the letter of that requirement will no doubt be determined by Regulations still to be promulgated.

In any event, the Pension Investment Committee at International Harvester Company, with the help of outside counsel, has been trying to determine the optimum mix of investment between fixed income and equities.

The basic input to this exercise has been:

- (1) A 10-year projection of contributions to International Harvester Company pension funds assuming various funding objectives, rates of investment return, and anticipated plan improvements,
- (2) A 10-year projection of benefit payments from International Harvester pension funds under the same alternatives, and
- (3) A 75-year history of Standard & Poor's Composite Stock Index and Standard & Poor's High-Grade Bond Index.

One of the interesting aspects of this project, and one that cuts to the core of the investment mix question, is that the Standard & Poor historical rates of investment return are approximately 9% per year on stocks, - that, my fellow fiduciaries, is plus 9% per year, believe it or not - and plus 4% per year on bonds. As you might expect, the distribution of stock results is considerably wider than the less volatile bonds. The \$64 question is: do today's 9% bond rates represent temporary insanity or are they representative of a fundamental change in our capital markets due to the permanence, or expected permanence, of inflation? In either event, what is the corresponding implication for stocks? Your answer, or your investment adviser's answer, to these questions will go a long way towards determining the appropriate investment mix for your pension plans.

Returning to my exercise, if we calculate contributions to International Harvester pension funds on an actuarial basis designed to satisfy both International Harvester Company and ERISA funding objectives, and add to it the cash-flow projection, we can ascertain asset targets consistent with International Harvester's funding objective at any point in the projection period.

We assume that investment return is essentially a random variable, that is, that investment managers cannot predict stock and bond market movements.

Considering the input, we can determine for any given period, the distribution of potential asset results and thus the probability that the asset-target will or will not be reached, based on the investment mix of the pension fund. As you might expect as a result of the historical market input to our study, higher rates of return are available in the long term with greater emphasis on stocks than bonds, but stocks also, in the short term, present at least a theoretically larger potential for not attaining either a 9% average long-term increment or even the assumed interest utilized in determining the asset target.

Discarding periods of less than 10 years as too short, and assuming that portfolio mix is rearranged annually, we can calculate the probabilities of not meeting the specified asset target in 10 years depending on the portfolio mix selected. Further, we can calculate the probabilities of not meeting the specified asset target by, say, 10, 20 or 30% thereof, based on the portfolio mix selected.

Cutting through a lot of math that I am sure would only bore the Enrolled Actuaries among us anyway, the results to date of this exercise are twofold:

First, the probabilities of not meeting asset targets are apparently minimized with an investment mix of 40 to 60% in either stocks or bonds, that is, between 40 to 60% in stocks, and the remainder in bonds, and,

Second, International Harvester is restructuring its pension fund portfolio as a result of this exercise with an objective of having 40% invested in each of stocks and bonds and 20% invested at the discretion of selected investment advisers.

Before you all dash to the phones to upset today's markets with this incredible wisdom, consider: (a) what you've paid for this information, and (b) that it's been developed within the constraints of International Harvester Company's particular actuarial assumptions, methodology and cash-flow projections and may not be at all applicable to any other pension plan.

The initial asset base and cash-flow elements play a major role in the results of this exercise. Investment earnings on existing assets and on the projected contributions net of projected benefit payments determine the amount of funds available for reinvestment in successive years. Obviously, a younger work force, a relatively greater initial asset-to-liabilities relationship, and/or a heavier contribution basis than International Harvester's would generate greater new monies for investment purposes than is true in our case.

We believe our results may have been substantially confirmed by at least one other study that was recently reported in the Wall Street Journal. This study was done by the investment performance services unit of Wertheim & Company, an investment management company. It covered the five-year period ended June 30, 1975 and sought to theoretically compare the results of different manager's investment strategies.

The scope of that study covered portfolio approaches that ranged from 100% investment in stocks through varying mixes of stocks, bonds and cash, to the other extreme of 100% in cash-equivalent investments. Quoting from the Wall Street Journal article, "Conventional market wisdom would give one or the other of these investment strategies a definite edge in the roller coaster markets of the past five years, but that belief would be essentially wrong. The Wertheim work indicates that an institution 100% invested in stocks, for example, averaged almost the same return as one 100% invested in bonds, or another that had 35% of assets in stocks and 65% in bonds.... Although the study centered on year-to-year gains or losses, even the quarterly fluctuation in rate of returns achieved under varying strategies were surprisingly close.... Such theoretical studies have their limitations, of course. They don't measure actual performance, for one thing, and they relate to a very specific period in time.... Other periods might show greater variations in achieved results...."

For example, the Wertheim study indicated that a portfolio invested 100% in bonds throughout the five-year period would have averaged an annual return of 8.3%. Another portfolio invested 100% in stocks would have averaged an annual return of 8.8%. Interestingly, and supportive of our

conclusion, a portfolio invested 50% in bonds and 50% in stocks - the assumption being that repositioning took place each June 30 - would have averaged an annual return of 9.0%. And a portfolio invested 50% in stocks, 25% in bonds and 25% in cash-equivalents would have averaged an annual return of 8.5%.

The best single strategy - again assuming June 30 repositioning - would have been to invest 100% in stocks the first year, in bonds the second year, in cash-equivalents the third and fourth years, and in stocks the fifth year.

We believe it very unlikely that we, with even the best outside investment management counsel, could consistently predict the best single investments in advance. And even if we could, it is very unlikely that we could force ourselves to liquidate and reinvest the huge portfolio of securities that we have, in order to take advantage of such timing. Thus, International Harvester feels most comfortable, and prudent, with the funding vehicles and investment mix that I have outlined.

MR. JOLLS: Well we have come to within 20 minutes of the end of our session. There are a few topics that we did intend to walk over lightly that we have not covered. I think it's most appropriate at this time to ask you who have been sitting there so patiently and attentively what questions you have of our panelists and what experiences you have that you would like to share with us? Let me start the ball rolling with a question directed to Ray Pinczkowski: Did you do an analysis based on your portfolio of what the effect would be of trying to liquidate it in a very short period of time?

MR. PINCZKOWSKI: Briefly we did. The missing link, of course, is speculation as to what would happen if you tried to dump \$100 million or \$500 million or a billion dollars worth of securities on the market at any one point in time. But we did go as far as to calculate the approximate amount of liquidity that is realized by the ten most active issues or the 100 most active issues on the New York Stock Exchange. To take yesterday as an example, from the morning Wall Street Journal, only three of the ten most active issues had a total dollar sales volume of over \$10 million. Our pension fund happens to be in the neighborhood of a billion dollars. General Motors is in the neighborhood of \$3 billion and a \$10 million sale is absolutely nothing compared to those figures. We concluded that it would be essentially impossible for a fund of our size, or GM's size, or anybody else's of that order of magnitude, to really achieve any degree of liquidity without just driving the price of the stock way down.

MS. NATALIE DeVINEY:* Mr. Pinczkowski, is your Company actively investing in real estate other than through commingled funds?

* Ms. DeViney, not a member of The Society, is an Associate Editor for Pensions & Investments magazine.

MR. PINCZKOWSKI: No, we are in commingled funds at the moment but we are not considering going to a direct acquisition program or anything like that.

MR. MARTIN S. FOX: Mr. Pinczkowski, you stated that an investment survey showed that it would have been most advantageous to be 50% in stocks and 50% in bonds during the last five years. Yet earlier you said, on an overall basis, you get 9% return on stocks and a 4% return on bonds. This clearly indicates that stocks is the place to be rather than bonds if you're looking for a longer-term projection. How do you reconcile the two and what are your conclusions?

MR. PINCZKOWSKI: The 9% is based on the 75 year Standard and Poor composite history. The 5 year study is just based on the 5 year period ending June 30, 1975.

MR. FOX: Since most funds are set up for a long-term situation, should we just disregard the five year study?

MR. PINCZKOWSKI: No, because in a five year period, you're really running the risk of having a substantial decrease in your asset values at a time when you may have generally increasing pension payments. To what extent can you run the risk of having the substantial decline in asset values?

MR. FOX: Are you talking about a mature fund as opposed to a growing fund or one just in the accumulation stage? You would be more interested in the S&P 75 year average than a five year study.

MR. PINCZKOWSKI: Right. One of the key elements in ERISA, too, is to diversify your assets and to minimize the possibility of a large loss. To the extent you're 100% in equities or 100% in high flying equities, I think somebody can make a pretty good case that you are not following the letter of the law.

MR. HARRY MORGAN: For some time I've been intrigued by the guarantee of principal and interest offered by the insurance industry and I want to raise a two part question with Mr. Chang. First part: do you have any measure of whether these guarantees have in the past been real rather than illusory? In other words, did a plan sponsor benefit in any fashion from the guarantees? Second part: if this did happen, then to what extent did it reduce the investment income rate paid to all other contractholders?

MR. CHANG: I think if Mr. Morgan had made a comment, it would be easier for me to argue. I am not entirely sure that the question doesn't contain some explosives. Have we measured whether a plan has actually benefited? The answer is no if you mean that, when a contract has gone to completion and the guarantee is paid, have we compared the return of income and principal with what the plan could otherwise have realized. I don't really know how we measure how well you would otherwise have done,

taking into consideration, of course, all the considerations that you would have had to go through at the time you are investing. Yes, at the very end of the contract I could say, had you invested in International Harvester, for example, you would have made so much or lost so much. If you were in Double A Utilities of a specific company, you would have made so much or lost so much. And I suspect that 9% guarantees or 9 1/4% guarantees or even 8 1/2% guarantees will somehow find themselves in the middle. I don't know whether this answered the question or not, but I would have to say if I were a plan sponsor that a 9% guarantee or even an 8 1/2% guarantee is a relatively attractive return in comparison to other available investments. Now where the money comes from is basically the actuarial question I was alluding to earlier. The discontinuance could come at an inopportune moment and the insurance company could lose because of the capital market risk; but on the other hand, it could also gain. To put it in another way, when the money is invested in 1975 and it's to be taken out scheduled in 1980, it really depends upon whether the financial market at that time is favorable or unfavorable. The whole thing is worked out, you might say, on a probability basis, and so that there is an averaging effect. Granted, you may have several contracts terminating in 1980 at the same time and you might say there is no dispersion of risk. But, in general, the terminations will come on a dispersed basis. Also contained in the question seems to be the question of how can you actually guarantee such high return if you're not making that much? You must be taking it from some other policyholder. Well that is not true. The answer to that is actually simpler than the other two and that is, insurance companies have a great deal of expertise in arranging private placements and private placements have a return generally 1/2% to 1% higher than comparable investments. All the pricing by insurance companies are essentially with reference to what the private placement market is at the time. A different question may be this: when it is being withdrawn, how can you achieve liquidity with the private placement market? Well, I think the answer to that is that we expect a continuing market for this type of investment. It is the same kind of question and answer that applies to ordinary life policies. Money comes in at a certain time, it goes out at certain other times and is essentially being paid by using the cash flow. The key question is not whether you can pay that amount when it is withdrawn, it is whether or not in the long run the risk has been properly dispersed and the risk has been properly reflected in the interest rate guarantees.

MR. JOLLS: Are there any other questions?

MR. CHANG: I would like to bring up a couple of matters for discussion. First, I have a problem with the proposition that equity investments must bear a higher return because of the higher risk element. If the market is indeed free, what we mean by risk is that there is a possibility of higher losses. Higher premiums pay for higher risks in the short term, but parts of it must pay for actual losses in the long run. It seems that we should wind up with practically the same returns for all different kinds of investments over a long period of time. This obviously contradicts the general proposition. Perhaps someone from the audience would care to comment on this.

Secondly, there is the concept of the financial market as a random variable. I cannot philosophically conclude that it is a random variable a priori. By the logic of things it would seem that where the market goes tomorrow is very heavily dependent upon where it is today and where it came from yesterday.

MR. JOLLS: Let me take a shot at your first observation. While you are here in Chicago, I invite you to visit either the American National Bank or the University of Chicago to talk with Mr. Ibbotson or Mr. Sincquefield. They have written a controversial analysis of the whole point and they lean to a conclusion opposite to the one you have expressed. They feel that the wide historical difference - 9% on stocks versus 4% on bonds - should be layered on top of, say, 8% current bond returns to get the expected return on stocks. Needless to say, their conclusion has not been accepted by everybody.

MR. PINCZKOWSKI: What interests me in that area is that, if we say that 9% for bonds is not temporary insanity and that it does represent a fundamental shift of capital markets, and if we then say that a common stock's price is essentially the discounted value of future profits of a company, you can make a case that common stock values are going to go down substantially. Many people are saying that this is what has been happening the last two years. I do not mean to say that this is my personal belief, but you can make a case along those lines.

MR. RICHARD W. ZIOCK: I would like to comment on two points raised by Mr. Chang. The first point relates to the disposition of a risk premium. If the difference in yields of stocks and bonds is, say, 9% versus 4%, and the 5% difference is a risk premium, will not the investor expect to lose that differential over time thru bankruptcies, etc.? The answer is no! A large part of the premium of stocks over bonds is due to the lack of liquidity of stocks. An extra yield is required by investors to compensate themselves for the lack of opportunity to cash in their investments at any time for their original investment. This might be called a liquidity element. Surely a part of the yield difference is due to the higher risk - danger of loss of principal - but a larger part is to compensate for loss of liquidity.

The second point concerns the statement "I don't think stock prices are random." Many actuaries have made similar statements. I am very disturbed by this and believe that there is some misunderstanding about this subject among actuaries as well as others.

A few years ago I was a member of the Joint Committee on the Theory of Risk whose assigned task was to determine deltas to provide a reasonable margin for contingencies. It seemed to some of us that the answer to this problem could be found by computer simulation using stochastic (random-walk type) models for interest rates, mortality and withdrawal rates. Others on the committee objected to this approach because they felt interest rates were not random. I felt their objection was based on a misunder-

standing and wrote an article in ARCH (9-19-75) titled "The Interest Rate Delta" after some research in the literature of the theory of finance.

It seems to me that people who say "I don't think stock prices or interest rates are random" are saying that price movements are caused by real events such as supply and demand, labor strikes, changes in corporate earnings and a host of other causes too numerous to mention, and that therefore they cannot be random. They would say that price changes are either deterministic (i. e., caused by events) or random. Clearly they are deterministic, therefore they are not random. Let me state very clearly that I agree that stock prices are determined by external events. To hold otherwise would be ludicrous.

The randomness could be defended simply by stating that the random walk provides a very good mathematical model which fits the data. That would suffice for me. But there are deeper reasons why it is a correct model.

In fact, the deterministic model and the random-walk model are not opposites, but, surprisingly, are complements. In the theory of finance the efficient markets hypothesis provides the justification for the random walk. A corollary of it is that if prices were not a random walk, i. e., if there was some systematic exploitable trend or movement which occurred regularly, people would exploit it. That very exploitation would remove the systematic movement. Stated another way, if, for example, every leap year on days with full moons the market would rise 10%, some smart people would discover that fact and buy stocks before and cause the rise to take place before schedule, eliminating the scheduled rise. Does this idea conflict with the deterministic model? Of course not. Even if some deterministic event occurred in such a manner as to be predictable, then the resulting price movements would be exploited earlier and the time of the effect of the event would be changed but not the effect of the event. I am reminded of the "cone." Hold it one way and its projection appears like a triangle, hold it the other and it looks like a circle. Both are right. The same is true of price fluctuations; they are both determined and random.

I hope you are convinced that the random walk does not conflict with the cause and effect model, because there are many actuarial problems in pension and life insurance to which at least partial answers can be given by using random walk and other stochastic models.