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## CURRENT TRENDS IN THE INVESTMENT OF PENSION ASSETS

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MR. COLIN G. CARLTON: I am moderator for this session which is Current Trends in the Investment of Pension Assets. It is good to see so many of you here, as I believe this topic, despite a rather innocuous title, is one of the most important issues that actuaries may be involved with for the rest of this century. The economic impact of pension funds is increasing all the time. For instance, in Canada pension funds now constitute perhaps fifty billion dollars as compared with the total capitalization of the stocks in the Toronto Stock Exchange 300 Index of only 80 billion dollars at the end of 1980.

I did say that actuaries may be involved with the management of pension investments quite deliberately, because to date we have not been as involved as I would like to think we should be. In fact, if I can use this position to preach a little, our involvement with pension funds has been very one-sided. We have focused most of our efforts on elegant descriptions of the liabilities but often founded on a very crude model of investment returns. Although our training in statistics and compound interest and our orientation towards forecasting qualify us for a sound understanding of the assets side, few of us have carried this any further (at least in North America). It is interesting that none of the panelists is, in fact, an F.S.A.

We have left the business of managing the money, and even the overall financial planning of pension funds, to others in many cases. Perhaps it is because we are afraid to make mistakes; after all, a miscalculation of actuarial liabilities may never be found, but an incorrect decision on the assets will soon show up on the measurement charts! But no one, especially investment managers and actuaries, excluding of course those present today, makes no mistakes. So what can be done in an uncertain world? A simple and fundamental answer is to diversify investments both within asset classes and across asset classes, and perhaps even across fund managers. Now, the mathematics of diversification to describe the effect of diversification on risk and return are well within the grasp of any actuary, but for few of us is it part of the standard tools of our trade.

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The major impact of inflation on both pension assets and liabilities has had at least one positive side affect; it has made us realize that the bottom line in the pension fund, i.e., the employer's contribution rate, is not a simple outcome of the benefit formula and actuarial basis. The contribution is, in fact, the result of the interaction of the emerging liabilities and the developing fund of invested assets, and our opportunity today is to learn from three recognized experts more about the asset side of the actuarial balance sheet and about financial planning for the total pension fund operation.

Our three panelists have diverse backgrounds but all qualify as experts. Don Ezra and Keith Ambachtsheer have both frequently submitted themselves to the examination of their written opinion in professional journals. Both of these gentlemen have clearly earned the respect of the investment community. More salutary yet than writing or advising on the subject is making a living actually doing it. Bob Ruggles continues to be one of the most successful managers in Canada, and I look forward to his contrasting the theory with the practical concerns of today's money manager.

The session will fall into three parts. First, Don Ezra will provide his view of developments in the general fields of planning, structuring and monitoring for pension funds. Then, Keith Ambachtsheer will review some of the techniques that so-called modern portfolio theory -- though it is not so modern anymore -- has brought to this field. Finally, Bob Ruggles will discuss trends in the investment management of pension fund portfolios today. Likewise, we would like to take the questions in three parts; in other words, would you please direct your questions -- and I hope there will be many of them -- to each speaker immediately after his presentation rather than waiting to the end of all three presentations.

First then, Don Ezra. Don Ezra, as many of you know, is a consulting actuary who originally qualified as a Fellow in the English Institute of Actuaries as distinct from the Scottish Faculty of Actuaries. He has written noteworthy papers on bond immunization, and he is the author of what is still the only reasonably comprehensive book on the subject of pension management entitled "Understanding Pension Fund Finance and Investment". Don is a vice president with the Investment Planning Group of TA Associates in Toronto.

MR. DONALD D. EZRA: The three things I have been asked to concentrate on today are pension financial planning, to which I will devote most of my time, and then some words on real estate and manager structure.

Since this is a session on trends, I thought we might start with a little historical background.

Initially (in the dim distant past!), the investment of pension funds used to be considered in isolation. The investment objective was typically to maximize return; the thoughts of risk in the early days were not very well developed at all, and risk was generally ignored. Since there was a fairly well founded belief that in the long term equities were going to perform the best, there was usually a very high equity content in pension portfolios; and in the consulting field most of the activity dealt with the evaluation of investment performance and the selection of managers who could deliver the best performance.

Then we came to the changes of the 1970's. In particular, around 1974 equity performance simply plummeted, both in the U.S. and in Canada. As performance measurement developed, a rather uncomfortable phenomenon appeared, which was that the median performance of managed pension funds was usually below a passive index. At the same time, modern portfolio theory, which had been in existence for some time, had finally made the transition from being something only the academics talked about to something that managers and pension plan sponsors also began to talk about, and it put forward the idea that there was actually a trade-off between risk and reward; the two were connected. While all this was happening, pension funds had begun to grow extremely rapidly, generally faster than the growth of corporate assets, and in some situations the pension contribution began to loom extremely large in comparison with corporate profits. ERISA came along also, and one of its effects was to ensure that plan sponsors had reasons for the decisions they were making, and could justify what they were doing. Inevitably that meant they had to understand what they were doing. Finally, computer models became available for testing various kinds of "what if" questions, so that the decision makers could have in advance some feel for the possible ranges of results.

As a result of all this, we have seen some emerging trends:

- ° One of them is a recognition of the critical importance of asset mix. Not only does the ratio of the various asset classes in your portfolio have a strong affect on the results that you achieve, but it is one way of dealing with risk as well.
- ° The investment manager's role is seen perhaps more realistically now, not as the provider of miraculous returns but as someone, a very intelligent professional, dealing in a reasonably efficient market, who can achieve what the market will allow him to achieve and, in some cases, one hopes for a bit more as well.
- ° The whole idea of corporate risk exposure has become more prominent, and the question that comes to mind in this context is; if things do go wrong (which is the simplest way to think of risk), what does it mean to the corporation? What it means to the corporation, as Colin mentioned, is that there are higher contributions necessary because assets have not kept pace with liabilities. This requires integrated asset/liability models to be used, rather than considering the investment question in isolation.

Finally, let me not exaggerate. While these are emerging trends, they are only just beginning to emerge. I understand, for instance, that fewer than 25% of all U.S. and Canadian pension funds actually have a coherent statement of investment policy.

One possible framework for a corporation to make its risk-reward decision is to think of its pension fund as an operating subsidiary of the corporation. As an operating subsidiary, the pension fund has one very interesting feature: it is a capital-hungry subsidiary. All those contributions that are going into the pension fund would otherwise be available as working capital in the corporation, so contributions represent capital that is being drained out of the main operations into

the pension subsidiary. It is also long term capital, because it does not come back to the corporation. The only way it can produce a return for the corporation is through the operations of the pension subsidiary which are simply investment operations; and the more successful those are, then for a given set of benefits, the lower the drain on capital.

As with any subsidiary, or indeed with any business, you need policy decisions. These can be made by the trustees or corporate management who are in effect the board of directors of the pension subsidiary. When they have decided on their policy, they must hire people to execute the policy, and they need a management information system to be able to monitor progress.

Let us focus on the investment policy decision. We are all aware of the fact that benefits, in the long term, must equal the sum of contributions and investment returns. Hence for given benefits, the way to reduce contributions is to improve the investment return. Since the return is very much a function of asset mix, it becomes important, in deciding on investment policy, to test the effects that different asset mixes can have on corporate contributions.

One way of doing this is, in fact, through the integrated asset/liability simulation models. Typically you start with the current financial status of the plan and some work force characteristics. The balance of the input consists of capital markets projections. One interesting piece of output is to calculate, for each possible asset mix, the possible range of future contributions.

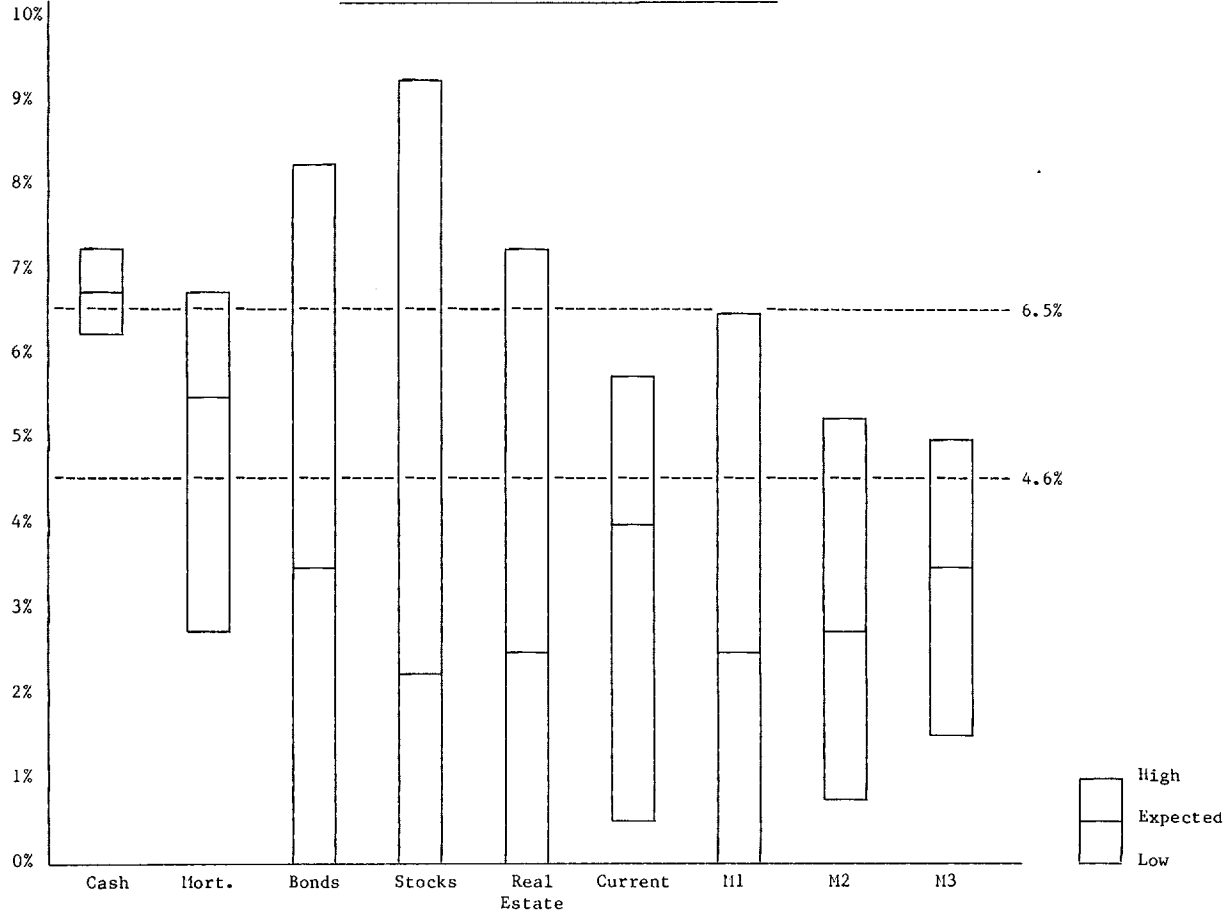
In one actual case, the output was as shown in Figure 1. Each bar shows the possible range of contributions for this plan in 1991 (10 years out), for the asset mixes shown. Also indicated is the "expected" or "best estimate" contribution. The first 5 bars from the left represent portfolios concentrated 100% in the indicated asset classes. There is a wide range of uncertainty in each case, except for the 100% cash portfolio. Diversification tends to reduce the range of uncertainty substantially.

Let me direct your attention particularly to the asset mixes labelled M1, M2 and M3. They are "efficient portfolios" in the sense that each has a lower "expected" outcome than any other portfolio with the same range of uncertainty. Three other characteristics of these portfolios are particularly interesting. First, each has a "worst case" outcome no worse than a 6.5% contribution rate, which was (by other means) determined as the limit of this plan sponsor's risk tolerance. Second, each has an "expected" outcome with a lower contribution than the current level of 4.6% of payroll. Finally, going from M1 to M2 to M3, as the range of uncertainty decreases, the "expected" outcome becomes less favorable. That, in a nutshell, is the typical risk-reward tradeoff.

Expressing the outcome of an asset mix in terms of contributions (that is, the capital drain from the corporation) is far more useful than simply relating the asset mix to the potential investment return outcomes. And expressing the contributions in cents per share, rather than as a percentage of payroll, gives the financial officer a much better feel for the affect of the pension fund on the business, because the operating division concept comes through much more clearly.

PENSION PLAN  
PROJECTED 1991 COMPANY CONTRIBUTION RATES

Contr.  
 As % of  
 Payroll



A long-term target asset mix can be chosen by the plan sponsor after this sort of simulation exercise, purely as a financial risk-reward trade-off decision. Often instead of a single target mix, an acceptable range of mixes is selected. Within this range, the actual mix is varied from time to time on the basis of the short-term outlook for the various capital markets. Clearly, then, short-term asset mix shifts are purely investment, as opposed to financial, decisions. And the final level of portfolio decisions -- activity within each asset class -- is similarly an investment decision, properly the preserve of the investment manager rather than the plan sponsor (unless the sponsor has specific investment expertise).

The last thing I want to talk about in the area of planning is that, as a result of this kind of exercise, one can arrive at performance standards. In fact, what one could do is simply maintain one of those asset mixes unchanged throughout, one within the acceptable range of asset mixes, and each asset class can be invested purely in a kind of index or neutral portfolio. No judgment then gets exercised at all.

Therefore, since you always have the option of a neutral or passive investment position, that passive position sets a benchmark for each asset class. When the manager is given freedom to make security selections and trades, he ought to be able in the long term to beat the neutral or passive benchmark. Similarly, to the extent that he is given freedom to change his asset mix within the given range, that freedom should, in fact, in the long term produce better returns than simply a neutral unchanging asset mix.

So you can now measure the effects of the manager's two levels of activity (asset mix shifts and performance within each asset class) against neutral benchmarks, and see whether his judgments have actually added any value to the portfolio return. And that is a different method from the usual method of measuring how the manager has performed relative to a large universe of pension funds. It does, however, have the very great advantage that it is completely consistent with the philosophy that you hire a manager because of the value of his judgments, and you therefore expect his activity to do better than a no-judgment neutral or passive portfolio; and you measure him specifically against that neutral or passive benchmark. You do not, incidentally, measure him against something like a real 3% return; you have to measure a manager's effectiveness against a benchmark that is composed of the elements that he is able to choose from, and therefore, it has to be a market-related benchmark (as opposed to an inflation-related benchmark, for instance).

That is all I wanted to say on the aspect of financial planning for pension funds. I would like now to say a few words about real estate. In particular, why is it of such interest now? After all, it has always been available as an investment, and large pension funds have been investing in real estate for several years. Let me explain two main reasons, out of perhaps half a dozen, that have made real estate a pension buzzword today.

First, the availability of traditional pension fund investments -- stocks, bonds and mortgages -- has been shrinking.

The number of companies listed on the Toronto Stock Exchange has actually declined in recent years, let alone matching the pace of pension fund growth. At the end of 1976 the number of companies listed was 905; by the end of 1980 it fell to 799. This was caused by takeovers, mergers and public companies going private.

The bond market is becoming dominated by federal government issues, because the federal budget deficit alone requires \$1 billion a month to be raised. The corporate share of new issues has fallen to just 17%, since corporations have been deterred by the very high interest rates they must pay to borrow money.

High interest rates also have deterred borrowing through mortgages. Mortgage terms have been shrinking as borrowers avoid committing themselves to paying current interest rates for too long. There is also a distinct tendency for mortgage default rates to rise as interest rates rise, not exactly an encouraging inducement for pension funds to lend money through mortgages.

Thus, the shrinking availability of the traditional types of investment has forced pension funds to look for new types. Real estate is simply the most prominent of the new types.

Not only is the availability of traditional investments being called into question, but so also is their appropriateness.

Through the 1970s one of the most dramatic economic experiences has been the entrenchment of high -- some would say increasing -- rates of inflation in economies throughout most of the world. It used to be thought that high rates of inflation were a temporary aberration. More and more, it is now felt that we simply have to live with them, because at best inflation will only come down gradually. This feeling brings with it the natural consequence that investors begin to search for assets that can preserve their real value -- their purchasing power -- in inflationary times.

Stocks have obviously proved to be a good long-term investment. However, if you examine their performance carefully, you find that they are not really an inflation hedge, in the sense that there is no correlation between stock performance and inflation. Indeed, the immediate impact of unanticipated acceleration in inflation is to depress stock prices.

With fixed income securities, the relationship with inflation is clear: the higher the rate of inflation, the worse their performance. Coupons and interest rates that appeared fair when the securities were issued, lose their appeal as inflation increases, and the values of the securities fall. Thus bonds, which still represent almost 40% of a typical pension fund's assets, have declined in relative attractiveness as an asset class.

Investors have, therefore, reasoned that the most likely candidates to preserve their real value in inflationary times are not paper assets but "real assets" -- natural resources for which there will always be a demand.

Two of these have been particularly prominent: real estate, and oil and gas. They are both seen as essential commodities in limited supply. Real estate has the added characteristic that it derives its revenues from rents, and there is usually a very direct relationship between rental increases and inflation, so that the revenue stream from income-producing real estate makes a very believable inflation hedge.

Further, considering that the liabilities of pension plans are long term, and indexed to salaries (and therefore fairly well to inflation), real estate, being a long term asset with inflation protection, becomes particularly appropriate for pension funds to invest in.

I would like to give you some idea of current intentions and trends in connection with real estate.

In Canada, as in the U.S., real estate constitutes less than 1% of total pension fund assets. A recent U.S. survey, in fact, revealed that, of those pension funds that owned real estate, the average exposure is only in the 1% - 3% range. However, the same funds stated that they intend to move to the 5% - 15% range over the next 5 years, so a substantial amount of new cash flow is slated for real estate investment.

In Europe, where experience with real estate is measured in decades rather than years, it is believed that U.K. pension funds average about 20% in real estate, while several large Dutch funds have 30% - 35% in real estate.

One large U.K. pension sponsor, the Imperial Group, has 50% of its \$1.7 billion pension fund in real estate, and currently allocates its annual \$100 million new cash flow 5% into fixed income investments, 45% into common stocks and 50% into real estate. Certainly the high rates of inflation experienced in the U.K. play a large part in the decision to concentrate on real estate and avoid fixed income investments.

The European experience has led one U.S. consultant to suggest that 10% - 30% might be a reasonable range for the average pension fund's real estate exposure, initially starting at the lower end and perhaps increasing over time, depending on the fund's overall objectives. His 30% figure comes directly from examining European statistics, while the 10% minimum comes from the argument that any new capital market should comprise at least 10% of the total portfolio in order to justify the corporate management time necessary to understand the new asset class and monitor its affect on the fund's performance.

In contrast to this sort of advice, our perception of the current Canadian situation is that pension plan sponsors are being advised by the managers offering real estate vehicles, to invest about 5% of their funds in real estate. However, this is not because those managers believe 5% to be an appropriate long term real estate exposure -- it is simply because they cannot currently cope with being given much more than 5% to invest! Even 5% of all Canadian pension funds would amount to \$2 - \$3 billion, and this is much too large a cash amount to be chasing real estate at one time. Therefore, once their clients have 5% invested in real estate, it is virtually certain that the managers of the real estate vehicles will raise their recommended allocation, probably to 10%. After that it will become



a major asset class in its own right, and more formal methods of determining asset mix might be considered.

Now on to the last topic, the question of manager structure.

Several types of structure are possible. Managers can be internal or external, single or multiple, specialized or balanced. We have found there is no one structure that is automatically right for all cases. So what we do is try to find out exactly what the plan sponsor is trying to achieve. For example, does he want to have as little involvement as possible? If so, a single balanced manager might be indicated; it avoids the need for a cash flow allocation decision which would be required by multiple balanced managers, or an asset mix decision process which would be required by multiple specialized managers. On the other hand, if the sponsor is looking for superior performance, multiple specialized managers would be the theoretically optimal structure to use. Similarly, we discuss about a dozen criteria with the plan sponsor and establish which structure fits his objective best. I repeat, it is not right to say: "There is one structure which is always, in every case, the best."

Finally, let me talk briefly about the idea of style diversification, in selecting managers.

Let us look, for example, at equities. In theory, we can find specialists in market timing, specialists in sector rotation (moving from one industry to another) and specialists in picking specific securities. Perhaps in the United States this does happen. The reality in Canada, though, is entirely different. We have profiled about 30 investment managers and asked them to list in order of importance how they rank these three areas of specialization. Twenty out of 30 ranked security selection their most important method of attack. Only two consider themselves market timers. Eight go for industry selection. All of them, in fact, said "We really do not classify ourselves as a specialist in any one of them; we really have to employ all three, depending on market conditions, and to pigeonhole us in any one slot really is not appropriate at all."

You can see why there is a difference between the U.S. scene and the Canadian. In the U.S., the capital market is very diversified; you can invest in all kinds of securities, whereas in Canada we have stocks that are largely dominated by resource securities. The breadth of the market is, therefore, very extensive in the U.S. but quite limited in Canada. The depth of the market, the amount you can actually purchase or trade, is considerable in the U.S., and again very much more limited in Canada. So there is little opportunity to specialize in Canada, whereas in the U.S. you really can pick out a niche and say "I am going to specialize in that" and be good at it. Also, in the United States you have over 3,000 investment managers registered with the S.E.C., not counting about 14,000 different banks, and there is certainly a lot of pressure to differentiate yourself from the guy next door; in contrast in Canada, with 40 to 50 investment managers throughout the country, there is very little competitive pressure to be a specialist or at least far less than in the U.S.

Due to these features, it is erroneous to take the style diversification argument that applies in the United States and simply assume that automatically the same argument applies in Canada; it just does not.

MR. MURRAY A. SEGAL: Mr. Ezra, in your presentation regarding risk or the possible variation in contribution rates, obviously you have to determine some probability distribution with respect to each type of asset. In your projection, the illustration was to 1991. I am thinking back to 1971, for example, when inflation was running in the order of about 3% a year, there was a traditional relationship between long term rates of interest and short term rates of interest; that is, the long term rates were higher than the short-term rates, and it looked like the stock market was going to do well, at least in the U.S. In Canada, it has done well, but I am thinking about the U.S. situation. If one had applied those probabilities that you used for your 1991 illustrations back in 1971, would they have been of any use in projecting what would have actually happened by 1981? For example, say that you are dealing with a union, and you know that every time they come up for negotiation they are going to increase benefits with increases in the cost of living. Could you have put a probability distribution on it which would have resulted in something meaningful? How do you go about establishing those probability distributions? That is one question.

The second question I have is; with respect to the real estate which looks good right now -- you know, everybody is an expert in retrospect -- real estate in Canada has just taken off, or has taken off and reached very high levels in certain areas of Canada, but not necessarily in all areas. For example, in the Province of Quebec real estate markets were depressed for quite a period of time. Also, we have rent controls in Ontario which do not appear to be coming off now, at least for residential real estate, and there is a lot of rent involved in that sector. We know what the experience has been in New York City where in residential real estate landlords have just abandoned properties. We know that commercial real estate has done well in the last few years, but there was a period when it looked very, very depressed. I think you said that real estate represents a pretty good hedge against inflation. Why do you think that that is necessarily a better hedge than an across-the-board selection of common stocks where the theory is that profits are going to keep up with inflation in the long run? Why is that one particular segment of equity investment necessarily going to do better than corporate profits over the long run?

MR. EZRA: Let me deal with those questions quickly, in order. The first one was how do you get a probability distribution to project? This is an extraordinarily difficult thing to do, and one of the ways of coping with it is to reflect past events. One might look at 10-year scenarios all the way back for, let us say, 50 years and get five or six scenarios out of it, projecting them all forward in whatever proportions they have occurred. One is then saying one really does not know quite how things are going to turn out, but merely that inflation-adjusted events in the future might follow what they have done in the past. That might be one way of deriving a probability distribution for the future: the same as the past. One can do that for determining long-term investment policy; it then becomes a question of immediate strategy to decide what is the short term outlook, and where you position yourself within the ranges that you have derived by looking at those long-term considerations.

The second question you asked was why, after some of the experience with real estate, would one consider that to be a better hedge against inflation than a well-selected stock portfolio. This is simply because direct ownership in real estate tends to produce revenues that are intuitively, one believes, better correlated with inflation. I am not suggesting that it is going to be a better investment; I am merely suggesting that it might be more closely correlated with inflation. Stock portfolios might outperform real estate, but their returns are not necessarily linked to inflation in the short term. There is nothing really that suggests that the specific revenues one gets from a corporation are necessarily going to be tied to inflation over short time periods. One hopes they might be, but there is a little more direct correlation with the income from a real estate property, in that its income is rental, and rentals tends to be fairly well correlated with inflation. Also, one must certainly warn that the characteristics of real estate as a class are obviously not necessarily going to be reflected by every single real estate investment.

MR. RICHARD DASKAIS: I have two questions, both relating to this chart which Murray Segal asked about. First, following up on Mr. Segal's question: How comfortable do you feel with the idea that past risk-reward relationships will continue in the future? For example, isn't it possible that the superior performance of stock in relation to fixed income investments over the last 10 or last 15 or last 25 years has been due to a decrease in the reward for risk for stocks as opposed to fixed income investments? Second, you have drawn as an illustration some sort of a threshold of tolerance for high pension costs of, I believe, 6.5% of payroll. I wonder if for many companies the threshold of tolerance is not an absolute percentage of payroll but rather related to their competitors in whatever business they are in. In that case, it seems to me, what they want to do is either follow the herd or be a little bit ahead of the crowd, depending upon how it might be characterized.

MR. EZRA: The first question: why would one assume past risk-reward relationships would continue? You do not have to have that kind of neutral set of assumptions to put forward, but if you have a specific viewpoint as to how returns are going to work out in the next few years, I would argue that that might be seen more as a strategic or tactical decision than as a basis for formulating long term policy. But if you want to use your own views about the future as inputs for capital market assumptions, that is a perfectly valid way to go about it. The results I showed, in fact, used historically neutral assumptions and left it to the manager to decide where he wanted to position himself in the short term if he felt that current risk-reward relationships were going to be different from what they had been in the past.

The second question was: how does one set that risk tolerance threshold? In a variety of ways; and it is another extremely difficult thing to do. In this particular case, the simplest way for the company to conceive of it was to ask, "How high up could contributions go today without our feeling too worried about things?" Very much a gut feel kind of thing, but when you have a committee of people all thinking explicitly about that one question, and all coming up with their gut feel reactions (and they all see it in different ways), it is the best way we have found of coming up with any kind of measure of risk tolerance, whether it is absolute, relative or whatever.

MR. CARLTON: I am going to have to cut the questions off at this point to give Keith Ambachtsheer a chance to speak and I hope there will be time for more questions at the end of the presentation. Keith started his career in investments at Sun Life after completing a graduate degree at Western and postgraduate studies in economics at McGill. He has been associated with Canavest House, a Toronto investment dealer, since 1972 where he was involved in the design and implementation of investment services based on new quantitative methods. His publications have appeared in the Financial Analysts Journal and the Journal of Portfolio Management, and in fact, he has won the prestigious Graham and Dodd Award from the Financial Analysts Federation for his article "Can Active Management Add Value" in the Financial Analysts Journal. The program notes are correct in the technical sense that Keith is employed at Canavest today, but on Monday he will be employed at TA Associates.

MR. KEITH P. AMBACHTSCHEER: Quite by accident, I would like to carry on where Don Ezra left off in his last chart which is that profile he did on some of the things that are going on in the investment management business.

What I would like to focus on is what has been happening in the investment management business as a business during the last 10 years. Like many service industries, it is been undergoing some profound changes. The one that I would like to focus on is technological change. A lot of the technological change in the investment management business has come under the heading of M.P.T. or N.I.T.; M.P.T. - Modern Portfolio Theory, which has become an all-encompassing word involving really anything to do with technology. The more general word is New Investment Technology which, again, is this broad group of quantitative techniques which have been introduced into the business over the last 10 years.

From an organizational point-of-view, I would like to start at the beginning. A 1952 paper by Harry Markowitz is generally considered to be the theoretical basis for the technological developments that have taken place in the investment management industry. I would like to talk a little about what Mr. Markowitz had to say in 1952 and then view some of the evolution of those ideas to bring us up to today and have a look into the future.

Markowitz's paper in 1952 focussed on the quantification of investor attitudes. He said, "I observe that investors tend to be risk adverse." So what we are showing here is an indifference curve and the idea that for an investor to be indifferent at higher levels of risk exposure, he must be shown ever increasing amounts of potential reward. So on the investor side, it is a demand for risk and reward idea which, he said, in principle ought to be subject to quantification. Moving to the supply for risk and reward side, again he said, "There are some ideas here which to date have been very qualitative which, again, in principle ought to be subject to quantification." He said that the output of the investment analysis process ought to be some view on potential risk and reward associated with security investment.

The other idea that he introduced at the same time is the importance of trying to understand the degree of covariability between returns on

different investments so that when we create portfolios we keep track of portfolio risk and return which deals explicitly with this diversification potential that different securities have with respect to each other. And that leads to the idea of an efficient frontier which, essentially, is those portfolios which at different levels of risk provide the highest expected reward. So the curve is a representation of the creation of different levels of risk, those portfolios which offer the highest expected return. And then he ended up defining the investment counselling business as the process of matching the demand for risk and reward with the supply of risk and reward.

Therefore, each client, each investor, ends up with his or her best portfolio, taking into account taste for risk and reward and the availability of the best combination of securities at different levels of risk which provide the maximum reward.

So, what did Markowitz do? Well, in one sense, a lot of investment managers would answer, "There is really nothing new here. These ideas we are involved with and profess all the time." So that is one kind of answer. I think the other kind of answer is that there is something profound and dramatic potentially in this kind of representation because it involves quantification. And once you get into quantification, there are a whole series of issues that come into play: the organization of investment departments, client communication, and many things that I want to briefly expose you to.

What has happened? Let us look 29 years later to see to what degree some of these ideas have, in fact, found their way into practice. One thing that has happened in the last 29 years is that data bases have become available; i.e., a lot of data about companies and about security returns and investment performance. Computers have become available that can process this data in large volumes very quickly. With the availability of the data, a lot of the risk-reward ideas that were there in theory have, in fact, been tested out, and in many ways there has been an evolution over time of formal risk-reward models which now have come into fairly general use. Therefore, on the quantification side, the technology on the computer data base side has facilitated the testing of many of these ideas and their actual implementation.

The other thing that has happened in the last 29 years is the dramatic growth in the private pension system and the institutionalization of savings. One way, of course, that this factor has impacted on the investment management business is in the appearance of a very sophisticated client; namely, the plan sponsor where huge amounts of money are involved and where that client is becoming ever more demanding and insistent on the quantification of many of these ideas. So that has been an impact which has led to a lot of the Markowitz ideas actually coming into practice.

One of the items in ERISA, the U.S. pension legislation, is the requirement for a formal statement and planning process with respect to investment objectives for pension plans. So there is a legal requirement to quantify the process.

The invisible hand has been at work in the investment technology business. With the availability of a lot of the ideas, the data bases, the computers, a new type of firm has sprung into being which we can call generally investment technology firms. Canavest House can, in fact, be characterized as one of those firms. These firms have moved into the business of providing software and data bases which facilitate both for money managers and for plan sponsors the actual quantification of many of these ideas. So that has affected the availability of the ideas.

With respect to education programs, the whole new approach to investments certainly is being taught extensively in university and even the Financial Analysts Federation now reflects many of these new ideas in its educational program.

One of the things that I think has helped clarify answering the question "What business are we in?" looked at from the investment management organization's point-of-view is the fact that potentially, at least, organizations can be in two kinds of different businesses or offer two kinds of services. One can be called the investment counselling service and that is really the one that Don Ezra was talking about earlier where the focus is on strategic planning, on long term asset allocation, on the structuring of the investment process, in-house management, multiple manager management, and those kinds of issues. This contrasts with a different kind of activity or service which is the portfolio management service. Here we are talking about the specific management of equity portfolios, bond portfolios, real estate portfolios potentially and the whole issue of the degree to which these portfolios should be managed actively or passively.

I think the portfolio theory concepts have helped to clarify that these are two separate parts of the investment management business that really need to be dealt with separately. What I would like to do next is look behind both of those potential kinds of businesses as to what some of the key emerging issues are.

What is happening in the investment counselling business is a much more formalized strategic planning process which follows from the generation of possible future experience, possible asset mixes and financial impact on the pension system leading to decisions. The way that new investment technology has impacted this process is through these kinds of ways. The definition of risk has gradually moved away from the original Markowitz representation which, for those of you familiar with his work, was in the context of the volatility of holding period returns, usually expressed in a probability distribution context using standard deviation. Over time there has been a movement away from that toward, I think, a more realistic representation which is really balance sheet and future service cost risk. One of the models that has been developed is, in fact, to transform the security market risk into balance sheet and future cost risk for pension systems.

Another issue here is: Who does what? What do I expect from my money managers in this investment counselling process? Another dimension is the relationship between market timing and multiple manager management. We need to distinguish between strategic planning and something which often gets confused therewith which I call market timing. In other words, the

shorter term market considerations of moving an investment fund to different mixes based on expectations over a shorter term basis. Organizationally, that issue fits much better into the portfolio management dimension which we will look at next.

One issue in portfolio management, where we are talking about the management of asset class portfolios, that has come out of this is the importance of the selection universe. In other words, what product is the investment management organization, in fact, producing for the client? Because some plan sponsors also manage pension investments -- and again this is, as Don Ezra mentioned, more a U.S. phenomenon than a Canadian phenomenon at this stage. Some investment management companies might strictly look at small capitalization companies as the sector out of which they create investment portfolios. Alternatively, another organization might purely look at emerging growth stocks as their selection universe out of which they create their equity management product.

A similar kind of distinction can be made on the fixed income side. A related issue is how active to be with the portfolio. There is \$10-\$20 billion which has been formally indexed or passively managed -- mostly in the U.S. since there is very little managed to date in this fashion in Canada. This has raised a lot of questions with respect to active management and what kind of excess return is a reasonable expectation for what level of excess risk and excess management fees. And again, the quantification of that process is well under way.

On the theory side, the most interesting evolution out of the basic Markowitz ideas has been in the common stock area where we understand, I think, much more now about the structure of risk and return than we did 20 years ago; where, for example, the basic decomposition that I am sure most of you are familiar with is looking at stock return and stock risk in the context of its market component; in other words, that part of return and risk due to market performance and the other, the remaining part, that due to the individual security. An evolution of that idea, in turn, is to consider more than one common factor. A number of multiple factors have been identified. It is been found, for example, that yield differentials seem to have a systematic return-risk dimension in the stock market, more so in the U.S. than in Canada.

Capitalization is another common factor which seems to affect securities, common stock returns, systematically. So these are some of the findings that are coming out of the research process as to how to look at and examine the return and risk on stock.

A related question, where I have personally had some experience and have written a fair amount, is the idea of predictive accuracy which is a necessary condition for successful active management. An investment management organization cannot promise excess return over some passive portfolio without an assumption of predictive accuracy of at least one of the components of security return. There is a modest level of predictive accuracy resident within many investment management organizations. How to use that modest level of predictive accuracy is, I believe and I think more and more investment managers believe with me, a very key issue because you are dealing with very low grade information. How you use that in the structuring of portfolios needs to be considered very carefully.

Portfolio revision is where the judgments about over- and under-valuation get reflected in the rebalancing of portfolios. This is an area where some emotion has come into the business because the investment technology firms have come along and are now providing on the marketplace optimization algorithms which can take predictions about security returns, adjust them for predictive accuracy, take information about transaction cost and suggest how a portfolio ought to be rebalanced as a computer printout. Many portfolio managers have felt that their major value added is the actual rebalancing of portfolios. So there is a bit of a machine versus the individual kind of debate going on in this portfolio revision area.

To a large degree still today, portfolios are being rebalanced by individuals, but maybe 5% of the money now, I would say, is being rebalanced - again largely in the U.S. - mechanically by these portfolio revision algorithms.

Don Ezra talked about performance measurement and attribution, and here, as Don pointed out, the trend is very much towards the creation of standards which are actually achievable by the portfolio manager as the standard of comparison, and then to look at actual performance relative to that standard of comparison which is actually achievable.

So answering the question: where are we 29 years later with respect to Harry Markowitz's 1952 article which said, in principle, investment management is subject to quantification? What I have tried to show here is that we have come a long way in all three areas from the point of view of the actual quantification of many of the ideas which he suggested ought to be subject to quantification. Like Don Ezra, I will also say that this can be oversold, and the reality is that, while this is an emerging trend, there is a long, long way to go.

MR. CARLTON: Keith, you have done a lot of work on the predictive ability of fund managers, and assuming you could find one that you thought had some predictive ability, how much extra return might it be reasonable to get, or to expect from finding that manager?

MR. AMBACHTSHEER: Some of the research that I have done in this area over the last five years suggests that number might well be (on common stock portfolios) 3% to 5% annual excess return if, in fact, optimal use is made of research methods that exist and which actually have been tested for predictive accuracy. In, for example, that paper that you mentioned "Can Active Management Add Value", Jim Farrell and I were able to show that using two published U.S. research methodologies of quite different types - one was Value Line, the other was Wells Fargo research - that if you combined those and used the information provided in that research systematically using portfolio revision techniques and taking care of transaction costs, we were actually able to produce 7% annualized excess return over a five-year period in the managed portfolios. Now that is the potential. I think most of you are aware that if you take a large universe of professionally managed funds, like the Becker universe in the U.S. for example, that on average the excess return adjusted for transaction costs, management fees, has been something like minus 2%, minus 3%. So it is a very large gap, but in my mind a lot of that disparity lies not in the fact that research has no value but, in fact, lies in the way that research is used in the rebalancing of portfolios.



MR. JOHN C. MAYNARD: I would like to ask both Keith Ambachtsheer and Don Ezra a very general question. Both of you have suggested a number of ways that investments can be brought in to make the pension plan more efficient and more effective. Don has talked about the new kind of investment of real estate, and if I interpret Keith correctly, he has been perhaps primarily talking about common stocks in his discussion. Now, both of these investments when you get down to the quantification of the results that we are talking about in the pension plan balance sheet will depend on how they are valued. And both types of investment require a method of valuation that is, let us say, not obvious.

When you're putting your money into bonds or mortgages, I think the valuation is pretty definite. Say for the moment that we are not discussing particularly the relation between market and book but whatever basis we are using, on an ongoing basis for the pension plan. It seems to me that the valuation of these fixed interest type of investments is fairly straightforward. But when you come to stocks or real estate, it is not obvious. However, a clarification of this would have to appear in the balance sheet and will, therefore, depend on the value of these two investments. So if I am right in understanding your discussions, when you come to real estate, the value will be there if it is well chosen and well handled. This means that the value can be written up, and the amount that is written up will be brought into income, and this will show up in relation to the liabilities and will indicate the effectiveness in the pension plan. The same will happen to the common stocks.

My question is: What valuation methods for real estate and common stock will you be using, and will they indicate the effectiveness of some of these portfolio techniques? Will you be able to write up the common stocks because the value will be there, and will you be sure it will be there, and will it indicate effectiveness in these portfolio techniques in the case of common stock? Will you have a good reliable method for real estate, because evaluating real estate is a difficult problem, but if you do not solve this problem, it will not show up in the bottom line?

MR. EZRA: Let me briefly expound, oversimplifying admittedly, on a philosophy of valuation which might be a little different from what you have just stated. Let's consider, for example, assets all at market. (Now there is the question of what is the market value of real estate, whether you go the appraisal route or whatever, but let's assume we can get some valuation.) But for stocks, bonds, mortgages, everything, let's consider market value on one side, and let's consider a realistic valuation of pension liabilities on the other, not something with 6 or 7% investment return assumptions. The comparison between the two would give us a realistic position, or best estimate today of surplus or deficiency.

What actuaries have tended to do is to put in a massive cushion on the liabilities side by valuing on a very cautious basis. They have then said, "That is such a big cushion, I can play around with the assets a little bit also; I do not have to reflect assets at market, because if I am going to be deliberately rigid on my valuation basis for the liabilities, then I would better build in some rigidity and not too much volatility on the asset side."

I think it is clearer to say there is a realistic valuation of liabilities, a market valuation of assets, and then some overall cushion that we put in to say that our declared published result is different from, and more cautious than, the realistic comparison. If you do it that way, then you can see that that cushion becomes one very important factor in determining risk tolerance, because you can let air out of the cushion from time to time if things go wrong, and you do not get the problem of distorting investment results by saying, "I will write up stocks but I will deliberately leave my bonds where they are." You do not distort a comparison between different classes of assets.

So to sum up quite simply, if you use just market on the one side and a realistic value of liabilities on the other, you get a much clearer picture.

MR. AMBACHTSHEER: I will just add one point and that is that if - not being an actuary, I can say this - actuaries change market values, then in essence in one sense what you are doing is disagreeing with the participants in the marketplace which in aggregate are a smart bunch of people. They make mistakes but if you change the market value of assets, what you should recognize that you are doing is changing some consensus view about future cash flow, whether it is in real estate or in stocks or in bonds that is being discounted back at some rate at a particular point in time, since that is what creates the market value of securities. My bias is to take that market value and to infer some discount rate out of it and apply that to create a present value of the outflow; that is the way my non-actuarial head works with respect to that question.

MR. MARTIN FRIED: There is a lot of data available to measure investment performance either in balanced portfolios, mixed portfolios or specifically common stock portfolios. However, I think that one of the main determinants of your result in investment performance is market timing or asset mix and the combination of both where you actually time changes of the asset mix. How does one obtain data over the long range in order to evaluate those firms which claim to be superior in these regards?

MR. AMBACHTSHEER: The only way that I can see doing that is by going through the formal separation of the strategic planning process which leads to a target mix. In other words, that mix where the fund would be if there were no particular insights with respect to the capital market short term. That then becomes the reference point, and any return positive or negative that the actual fund achieves through having a different mix, then that target mix is what becomes the raw data from which you draw inferences about market timing. There is a question as to whether any results that are produced over some historical time period has any potential significance in an expectational sense. What you are always trying to do is to guess whether the manager has a process which has better than a fifty-fifty chance of success. That is a very difficult thing to try and draw inferences about, but basically the key to it is to have a reference target mix. Otherwise, I do not know how you would do it.

MR. CARLTON: Our next speaker, Mr. Ruggles, is an American. We have had the good fortune to persuade him to work in Canada, because in his period

in charge of Imasco Limited's pension fund investments, the fund grew from \$50 million to \$210 million. Not only that, it ranked the number one fund in overall performance in equities in that period. Bob is now Chairman of the firm of Ruggles and Crysedale Inc., which is an investment counselling firm. With no further ado, I will hand it over to Bob for the practical side.

MR. ROBERT T. RUGGLES: I am always in a position that I am not very theoretically oriented. I am amazed myself sometimes, in retrospect, how much theory I have actually put into application years after it is come out, far too late sometimes.

It has been interesting also that we have been here and only heard in passing reference twice in this home of our great national government of Canada the trends which I see regarding the influence of government on investments. This is probably more pervasive in Canada than it is in the United States. However, it is still there, and you cannot make a single judgment as to investment trends without putting government moves right up at the top -- whether it is PetroCan or uranium contracts or anything.

Unfortunately for our business, it is getting more important to view sudden government moves, rather than government policies. You can do a fairly good job of determining whether the government is going to spend more or less or run a deficit of more or less, but it is the sudden government moves now that are throwing all of our investment moves into problems. I think we have to view that as a trend itself, that there will be more and more sudden government moves.

The second trend that we are working around is, of course, as we all know, that there are more requirements in pension benefits to cover inflation and portability. Not only can you read about it in the paper, but also you meet with pension investment committees who have directives from their board of directors to cover inflation in the fund returns.

Now, I am not saying that this is a good thing to do, but this is what is happening. Portability in the pension is, of course, raising the cost and raises the demands on the investment manager. There is more pressure on the employers by the unions and by others for inflation-plus coverage when they retire, and that carries right down to the investment managers who are now being told to have inflation-plus investment performance. Don Ezra said that is not really a good way of having investment managers do it, and I agree, but I have probably talked in the past three months to about 20 present clients, potential clients, and other interested parties and every single one of them has put inflation-plus on the agenda. And it is their number one requirement, so that is an investment trend that we will have to live with.

The fourth major investment trend we see is the volatility of all markets. Prices change suddenly, dramatically, sometimes with no reasons. The markets are thin -- Don and Keith mentioned this is especially true in Canada -- but the bond market in the United States on a comparative basis is no better than it is in Canada, if you want to do any business. There is a shift in emphasis away from earnings. In the past, everything was going to grow at a certain rate, and fall into asset value; when that goes out, then it goes from asset value to inflation accounting

and then it goes back to earnings, and nobody seems to know how they want to judge investments. So all those things make the volatility of the market enormous, which makes, of course, accounting more difficult.

It also makes measurement more difficult, as behind all this we have more and more comparative measurement. I really do not know how you are going to look at investment managers any other way, unless perhaps as Don Ezra said, against a policy or against other managers. However, it often goes beyond rational usage when taken together with the volatility of the markets within an arbitrary time span, which is very short -- one year, two years, sometimes even quarter by quarter. Sometimes you even get calls from clients wanting to know why I did not have Petrofina and why I did have Massey-Ferguson, or something like that. They never call you up to ask you the reverse.

Also, you can get a comparative measurement situation which the investment counsellors have to view as the trend and have to react to if they are going to live and breathe. We also have along that line, and Peter Drucker has been addressing this recently in writing for general management, but it applies equally to the investment counsellors, I think, that you have to take the long term versus the short term view, yet the pressure on investment counsellors is for short term results. However, all of the counsellor's thinking usually goes into the longer term investments, and there is a real conflict in the trends of investment counselling which that creates.

All these things come down eventually to the realm of specific investment policies which we have to address ourselves, and we, as well as fund sponsors, are trying to coordinate all these things into our policy. In the good old days, all you had to do was somewhere along the line decide stock/bond ratio, go back and more or less adhere to it; then when it did not work out that well, blame the other party and try to get by. But that is not easy, and Don and Keith have gone into it a lot more than I want to. However, it does lead more to specific investment policies.

In theory, of course, there are fewer industries and fewer companies to buy. It is becoming more difficult to get specific industries and companies and practically it is a major problem. It is extremely difficult, especially, in Canada to invest money, and I cannot overstate that. It is to the point where you are almost begging the forbearance of the fund sponsors by holding cash. Consequently, cash may be held back, but sometimes you do it because you cannot find a suitable equity investment or because you will be too heavy in those which are suitable. It is a significant problem, and it is going to get worse, much worse.

Other measurable investments are difficult to find; real estate is coming on, and other things. What is happening now is that I think the more imaginative fund managers -- four or five in Canada, perhaps ten or fifteen in the United States I know of -- are starting to go directly into asset participation. They will initiate this. They will go to companies and say, "We can tell from your balance sheet that you will not have enough money to live and grow over the next five and ten years. In our view these are the areas in which we will do it. If you agree, we will start from now, and we will furnish funds for either these specific purposes or for general corporate purposes." The instruments will be specifically designed for that purpose.

One which received publicity a year or two ago was the Canadian National pension fund in an oil deal -- very imaginative, very large size. These investments, which are not getting enough publicity, are happening with the fifteen or twenty managers I told you about. I think others will have to do it. They will either have to do it individually or they will have to join together to do it.

Now this is not a reactive process; it requires different skills from the investment counsellors. It requires actually going to a company and telling them something they had not thought of themselves, which is not always received very well. It could be the investment counsellor is wrong, but he usually is not when he gets into that situation. This is caused because there are not enough normal investments available. But this is very dangerous performance-wise for investment managers -- a bad market or a temporary down drift, or the fact that the government inflated faster than it planned to do. You are on the line here with the managers of companies, but I am afraid it is not only going to come, it is here; it is going to get bigger.

The high cash flows, of course, that Don Ezra and Keith Ambachtsheer alluded to do not help the situation at all -- the pressure is to get that money invested. I must hear from at least half the people I talk to, sometimes in jest: "We do not pay you to keep money in short term governments, we pay you to invest it." Well, if I hear that for the second or third time, I usually end up finding myself with the client, because sometimes you have to do that and other times you want to. It is trying to get into your own mind when to have to and when to want to, so that you do not rationalize it away.

All of this new emphasis by ingenious pension fund investors cannot be done in a vacuum; it needs the cooperation of the clients and the fund sponsors. They have to know what you are doing and why you are doing it. If they do not understand it, they are going to oppose it. They may feel that it is getting into their own jurisdiction; after all, they are the ones who buy out other companies, not you. You get into conflicts, perhaps if I am doing the XYZ pension fund or I buy a piece of ABC, there is a potential conflict there. If you end up with large pieces of a company, you end up with large voting rights. What do you do with them? Do you exercise all of that? I have no answers for these questions. There is no legislation on it, there is really no direction on it, and the potential for trouble is large.

We need, of course, the cooperation of actuaries in this. If you think that judging what a piece of real estate is worth on the market or in the long term is difficult, wait until you get into a piece of a privately-held company and try to judge what that is worth long term. Now, if you judge it too high, you are inflating your comparative measurement. If you do not, you are penalizing yourself. It is very difficult but has to be done. Pension funds and investment managers will be taking these pieces, they will be initiating them.

One area I have left is the use of options in investment management. I started doing them about twelve years ago, before they were listed options, over-the-counter and selling fully covered call positions, with the primary reason to get a cash flow into what was a stagnant non-growth

fund. That was my main purpose, and it was only for one fund. With the listed options coming on, it has become much larger. There was a time when there was only two of us in the United States doing that, one in Nashville and myself; now there must be thousands in the United States but very few in Canada. What it does -- I discovered later, I did not attempt to do this -- was it reduces the volatility on your holding significantly. So significantly that you get virtually a straight up line, with few fluctuations around it, in good markets or bad markets, on the option portfolio itself. The side effect of that was to enable the fund to go into high volatility situations, that is those with a higher beta and bring your whole portfolio, perhaps, back to an average beta with a higher than average alpha. This means that you have two kinds of stocks in your equity portfolio. You have big capitalization stocks, usually not too volatile, against which you can write options. You get a nice steady return, beat the Dow Jones or the Toronto Composite Index by one percent per month on average. This is very nice but not exciting, and in some areas sponsors want to be exciting. You have your volatile, usually smaller stocks, sometimes resource base stocks, which have a high volatility, which you put on the other half of the portfolio, and you do very well all in all.

Now this has not caught on in Canada yet; I do not know why because it should. The U.S. is going gangbusters on it. The next thing will be fixed income options and that is going to be very exciting for pension fund managers. I hope everybody gets into it because it is going to be just wonderful for the poor bond managers these days who can wipe the blood off. If they do it right, they can wipe it off with champagne.

Now, I guess a fair summary here from the practical side is that we have pressures, we have government pervasiveness, some restrictions, we have enormous volatility in the market, we have all that new money and we have reduced marketability of those things which still are there. We are trying to react to these trends by getting new markets: options, real estate, new tools (direct investment, initiating investment and new alliances), pension funds going together and pension funds going with corporations. The requirements that these pressure and reactions lead to will be that the pension fund investment managers have to be more ingenious; they have to be more daring and there has to be flexibility by the sponsors. There has to be responsiveness by the actuaries, by the lawyers, by the plan designers and it is not done in a vacuum. It is going to require a look at the future and more flexibility in a market that is more restrictive.

MR. LOUIS DOIRON: I have three short questions to ask Mr. Ruggles. What do you think about investment policy for small pension plans and the possibility to pool funds? What do you think about real estate and diversification for small pension plans? And, what do you think about capital asset pricing theory telling that the best investment is a combination between risk-free investment and the market?

MR. RUGGLES: Dealing mainly with small funds, my experience with pooled funds is that they are probably necessary for small funds, but you do not get a very good return on them. You may, if you get a small fund that is growing, find a responsive, flexible pension fund manager and try to work with him on it. You can get one policy, of course, for an individual fund

no matter large or small; it is what Don Ezra or Keith Ambachtsheer can help you do.

Real estate and diversification for a small fund is very difficult. They are coming out now with some large real estate pools. There is no history on them. We do not know how well they will do, and you get a little nervous when these things start coming out because the minute anything like this starts coming out, the big funds start doing it just about the time you do not want to be in it anymore. But you probably have a little while to go on that. Perhaps Don Ezra or Keith Ambachtsheer would like to answer the third question.

MR. AMBACHTSHEER: The capital asset pricing model is a theoretical construct, and it deals with what happens to security pricing when there are only two investments. One is this risk-free investment and the other is the market portfolio of risky investments, and I think the more even theoreticians have thought about this theoretical concept the less applicability it actually seems to have in the real world. You cannot really define risk-freeness without specifying the investment horizon. What is risk-free for one type of investor is not necessarily risk-free for another. What is risk-free in nominal terms, is not necessarily risk-free in real terms. So, I think the realities, in a sense, have overwhelmed this very simple elegant construct of two investment classes. It is really not a matter of investing in ninety-day treasury bills and the stock market, but in fact, we need to be explicit about real estate, about options, about all the real world things that can be invested in.

MR. JAMES L. CLARE: On the one hand, the panel is explaining that there is more pension cash in Canada than can be suitably invested. On the other hand, people in business and industry tell us how short of investment capital they are, for example for energy development, and for the development of real estate projects. Why is this so, and what can be done about it?

MR. RUGGLES: I would like to comment a little in that area. Is this a real problem? I think we can probably all comment on it. Some of it is legal. There are many legal restrictions, probably more in Canada, as to type of assets you can invest in, the concentration of assets and so forth. This makes a direct investment, for instance in oil, very difficult to do, especially if you are not in a huge fund. Also, in Canada there are restrictions on investments outside the country. So that puts the Canadian investor in a bad seat. Now this can also be used as an excuse for not doing things which perhaps you should do or initiate. So, you can point to legal restrictions, and they are real. I think what you must do is attempt to be flexible yourself. As an investment fund manager, when you see opportunities, you should try to follow them through, but you know we still have to be prudent on this; and unfortunately the demands for funds are usually in the areas where you have the most risk and the least information. Just to add one comment, that is, that the demand and supply is partially in the eye of the beholder. It is always a question of expected risk and expected reward. For example, there are a lot of organizations that will sell you a lot of bonds right now at close to current market prices, if only there were buyers. Why are not the buyers there? Well, it is some perception of expected risk and expected reward. I could make a case for pension funds

that straight or ordinary long bonds today are probably a very good investment and there are lots of them around.

MS. ELIZABETH C. BERNI: I will address this to anyone on the panel. I was wondering about commodities as an investment vehicle for pension funds or possibly a mutual-type commodity fund.

MR. RUGGLES: Well, we have severe legal restrictions on commodities, and the volatility in them and the lack of knowledge, I think, of the investment manager.

MS. BERNI: The legal restrictions, are you talking about Canada?

MR. RUGGLES: Yes.

MS. BERNI: Are we addressing the United States at all on this?

MR. RUGGLES: There would be legal restrictions I suppose in the U.S. However, I do not think any of us knows the answer. In principle, perhaps not written down as they are in Canada, but if you lost money in commodities in a pension fund in the United States without clear direction from the ERISA statement, I think you could be in extreme difficulty from legal suits. But I think there are other ways of doing it. You could hold shares in commodity-oriented companies -- which in Canada is about 90% of the things we have. And, perhaps this is a better vehicle for pension fund investments than the mere holding of commodities. Now if we take it one step further and say that it is not just the playing of the commodities we are holding for a short term, 6 to 8 months, 12 months, a couple of years, but that you hold them in certain types of commodities for inflation-proof purposes for longer periods of time. That is another question altogether. I do not know whether you were addressing that one at all. If you are talking about precious metals, or rare metals, or things in short supply, or things to be used in war, just for inflation reasons, I know that is done slightly by some funds, but it has not reached epidemic stage yet, but it may.

MR. CARLTON: It seems to me this is the sort of thing that can, in principle, be put into Don Ezra's asset/liability model. You could get historical statistics about the returns on commodities, and you presumably could make some estimate as to where the returns and variability are going in the future. Put these in the model and see what degree of volatility that they engender in the contribution rate, and then decide as to what percentage is prudent to invest in a commodity fund.

MR. AMBACHTSHEER: In the U.S. there is an investment counsellor in Boston that is offering an inflation hedge fund which, in fact, I think is ten percent in a basket of commodities, ninety percent in treasury bonds, and historically that portfolio over the last thirty years has produced a real return of, I think, three to four percent, very steadily year after year.

MR. CARLTON: We have heard a lot about some very interesting matters and I think an important conclusion that comes out of it for me is that there is a real gap between the sponsor's expectations and the fund manager's potential delivery in the real world. And I think it behooves us to understand what is possible ourselves and to convey that understanding to our clients. Thank you.