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**GLOBAL INVESTING**

Moderator: JAMES A. CREIGHTON  
Panelists: TONY DARDIS\*  
              BLAKE R. GROSSMAN\*\*  
Recorder: JAMES A. CREIGHTON

- o Asset allocation issues
- o What relationships drive markets?
- o How significant are opportunities?
- o Why invest globally for equities? for bonds?
- o Currency issues
- o Administration and trading issues
- o The benefits of global investing for insurance companies

MR. JAMES A. CREIGHTON: The Society had asked me to moderate a panel on Global Investing for the Orlando meeting, and when the initial mailing went out, only my name was on it. There was an expression of interest from something under 70 people. When the next mailing went out and the names of Blake Grossman and Tony Dardis appeared, suddenly we had 350 people with an interest. So, I'm not sure how I should interpret that. I guess I'll keep my remarks reasonably limited and let them do most of the talking.

Global investing is certainly an area of great interest to the panel, and I hope that we'll be able to give you something that will be helpful or, at the very least, of interest.

I'll be making some remarks before turning the session over to my two colleagues, Tony Dardis from Victory Reinsurance in London, England, and Blake Grossman from Wells Fargo Nikko Investment Advisors. Blake had an opportunity to be in Tokyo or here talking to us, and he chose to talk to 350 actuaries which leaves me wondering about Blake's priorities.

I received my undergraduate degree in mathematics from Dalhousie University in Halifax and a master's degree from Northeastern in Boston. I became a Fellow of the Society in 1975 and was the Vice President and Director of Group Operations for the Maritime Life Assurance Company prior to joining Trafalgar in 1983. Trafalgar is an investment management firm in Canada, and we currently manage something in excess of \$1 billion of pension fund money for Canadian pension fund sponsors.

\* Mr. Dardis, not a member of the Society, is with Victory Reinsurance Company Ltd. in London, England.

\*\* Mr. Grossman, not a member of the Society, is Senior Vice President of Wells Fargo Nikko Investment Advisors in San Francisco, California.

## PANEL DISCUSSION

We plan to proceed as follows. First I am going to cover some aspects of global investing in a qualitative manner and make some specific remarks about opportunities in global fixed income. Tony Dardis will then follow with a more quantitative argument for a global investment perspective and will present a simple model to demonstrate the type of thought process necessary for active as opposed to passive international asset allocation. Finally, Blake Grossman, who manages a global equity portfolio in excess of \$5 billion, will talk about a number of specific issues and problems faced by the global investor.

I will make one other general comment before beginning on the subject itself. We no doubt have many actuaries whose primary interest is with pension funds while others focus on insurance company operations. Pension funds and insurance companies must look at global investing in a fundamentally different way. The need to report statutory solvency on an annual basis means that insurers must match assets and liabilities in a number of respects, including currency. This means that a Canadian life company view of matching their U.K. liabilities. Pension funds look at investment policy and strategy in a different manner. Because they do look at the very long term, the focus can be on maximizing the long-term risk/return trade-off without the constraints that are imposed by annual solvency tests. Global investing will be of interest to pension funds if this improves the return at a given risk level. Not surprisingly, as we will see, this turns out to be the case. I should point out that it may be productive for insurers to improve the risk/return ratio of their surplus account by looking at the benefits of global investing.

Why invest globally? How significant are the opportunities? Table 1 shows that following World War II, the North American economy and financial markets dominated the world. As late as 1970, North America accounted for approximately 72% of the world stock market with other areas being very modest in comparison. Japan was only 5%.

TABLE 1

Changing Nature of World Markets

	1970	1980	1989
U.S.	66.0%	50.0%	30.9%
Canada	6.0	5.0	2.7
Japan	5.0	17.0	39.6
U.K.	8.0	9.0	8.3
Other	15.0	19.0	18.5

Fact: Half the difference between Japan and the U.S. weights from 1970 to 1989 is due to currency exchange movement.

The U.K. was 8%, and all other stock markets in the world combined were the remaining 15%. As a North American-based investment manager, it made little sense to look beyond the North American markets. Not only was there a perception that there was limited opportunity abroad, but the postwar stock markets in Europe and the Far East were administratively inefficient, costly, and outdated by North American standards. Difficulties of many types, such as a lack of modern procedures, systems, transaction

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taxes, lack of liquidity, high commissions, difficulties with settlements, difficulties with dividend collections, etc., made many local markets unattractive to outside investors. The world has changed dramatically. North America no longer dominates the world economy or financial markets as it did 30 years ago, and you can see in Table 1 how this has happened progressively over the 20 years from 1970-90. By the time we reached the end of 1989 North America had fallen to roughly one-third of the world equity market. Given the fall in Japanese equities this year, the Japanese number has changed a little, and if you look at the updated figures, what you'd see is the Pacific Basin would form about 40% and Europe would form roughly 30% of the world equity market. That is a very dramatic change over the last 20 years.

Moreover, in specific areas, such as banking, steel, electronics, consumer products, and so on, North American firms are no longer the dominant players in the markets. I have picked one industry group to demonstrate the point (Table 2), but you can look at many industry groups and see a similar pattern. In the steel business, all of the top

**TABLE 2**  
Steel

Company	Country
1. Nippon Steel	Japan
2. NKK	"
3. Kawasaki Steel	"
4. Kobe Steel	"
5. Sumitomo Metal Industries	"
6. Nisshin Steel	"
7. Daico Steel	"
8. Hitachi Metal	"
9. Mitsubishi Steel	"
10. Tokyo Steel Manufacturing	"
11. Nippon Yakin Kogyo	"
12. Nippon Metal Industry	"
13. Nippon Stainless Steel	"
14. Thyssen	Germany
15. Hoesch	"
16. Klockner-Werke	"
17. Falck	Italy
18. Dalmine	"
19. Lamagona	"
20. British Steel	United Kingdom
21. Sandvik	Sweden
22. Acerinox	Spain
23. Hoogovens	The Netherlands
24. Amalgamated Steel Mills	Malaysia
25. Arbed	Luxembourg
26. Nord-Est	France
27. National Iron & Steel	Singapore
28. Steel & Tube Holdings	New Zealand

\* The two largest North American producers, Bethlehem and Dofasco, would be 12 and 13, respectively.

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producers are in the Pacific Basin or the Far East at this point. I didn't put the North American producers in, but if we put in the top two North American producers, they would be Bethlehem Steel and Dofasco, at number 12 and number 13 respectively.

I don't think that I have to belabor the point. If you confine your investment activities to North America, you are limiting yourself to an increasingly smaller part of the world financial markets and the world economy. Moreover, you will be ignoring the most successful and dominant firms in many fields. This means that you are not as effectively diversified as possible, resulting in a higher than necessary level of risk in your portfolio.

How significant are the opportunities? Well, it's impossible to predict the future with any high degree of precision. We can look at what has happened in the past. Because I am Canadian, I tended to concentrate a little more on the Canadian perspective, but the U.S. comparison is not much different. What we see in Table 3 are the returns to the end of 1989, over the past 11 years, for the Toronto Stock Exchange (TSE) 300 Index, the Standard and Poor's (S&P) 500, the Europe, Australia and Far Eastern (EAFE) index published by Morgan Stanley, and finally the difference between the EAFE returns and the Toronto Stock Exchange (TSE) 300. What you see is that over this time, markets outside North America have dominated the North American markets in terms of return. This is not surprising when one recognizes that the North American economy is much more mature than many other parts of the world. One consequence is that over the past decade, there have been much higher growth rates in other parts of the world than in North America.

TABLE 3

### Why Go International?

- o The second benefit historically has been better performance.
- o It does not necessarily follow that this will remain so in the future.

Performance (1979-1989)				
Years	TSE 300	S&P 500	EAFE	EAFE -- TSE
One	21.4	27.8	8.7	-12.7
Two	16.1	17.0	13.2	-2.9
Three	12.6	10.6	14.7	2.1
Four	11.7	12.3	26.2	14.5
Five	14.2	17.3	33.4	19.2
Six	11.3	16.4	30.1	18.8
Seven	14.5	17.4	29.4	14.9
Eight	13.3	18.4	25.8	12.5
Nine	10.4	15.5	22.5	12.1
Ten	12.3	17.4	22.8	10.5
Eleven	14.8	17.3	21.1	6.3

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Returns tell only half the story. Because world markets are not perfectly correlated, investors can achieve significant risk reduction by diversifying across world markets. Chart 1 shows the correlation between the S&P 500 index and the EAFE index, representing the rest of the world. What we see is that the correlation coefficient is around 0.5, which means that there is a significant opportunity for diversification of risk. Not only is the correlation coefficient quite low, but, in fact, it's lower now than it was in the mid-1970s. Why do we see this? Why are world stock markets not perfectly correlated? First of all, the composition of industry sectors is quite different in other markets than it is in the American market or the Canadian market. As we saw in the case of steel, Japan has a much more significant component there than you are going to find in either the American or the Canadian markets. The second point is that economic policies of countries differ. That's going to lead to different performances of economies and, ultimately, different performance for companies and stock markets. Finally, political cycles are different in different parts of the world which will also tend to lead to different return patterns in the world markets.

To look at similar figures for Canada (Chart 2), first of all we see that the correlation coefficient between the TSE 300 and the S&P 500 is very high at about 0.80. A correlation coefficient this high does not imply a significant opportunity for diversification. However, between Canada and a number of the other major world stock markets, we do see significant opportunities for diversification. If I put the same chart up for the S&P 500, you'd see a similar pattern.

The conclusion is simply that North American investors can significantly improve the efficiency of portfolios by investing outside of North America.

Let's look at efficient frontiers. Now, I don't know if you are familiar with the concept of an efficient frontier, but all we've done in Chart 3 is plot portfolio risk along the horizontal axis in terms of standard deviation of return, and along the vertical axis we've plotted the real rate of return. The bottom curve represents the asset classes that a Canadian pension fund would ordinarily invest in, that is stocks, bonds, cash, and a modest component of mortgages and real estate. As we start to add other asset classes, the efficient frontier moves upward and to the left. What that means is that for any given level of return, you can find a lower risk portfolio or, conversely, for any given level of risk you're willing to assume, you can find a portfolio that should have the greater expected rate of return. As you can see, the top line is one where we have included a 10% allocation to international equities and 10% to real estate. This results in far more efficient portfolios because of the increased diversification within the portfolio. Tony Dardis is going to talk about this whole concept in a little more detail. So, I am not going to belabor the point now.

Let's look at a similar chart for the United States (Chart 4). The curve to the right on this chart, the lowest curve, shows what you would achieve in an American portfolio if the portfolio was invested in U.S. stocks and U.S. bonds. As we start moving upward and to the left, we've added some international equity. We can move the efficient frontier even further upward if we add international bonds and then if we allow those international bonds to be hedged for currency risk. We make the final step by allowing our international equity to be hedged for currency risk as well. Not only do you achieve

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CHART 1

**INTERNATIONAL DIVERSIFICATION**

Provides more efficient total portfolio

Low correlation between U.S. and non-U.S. markets reduces overall risk

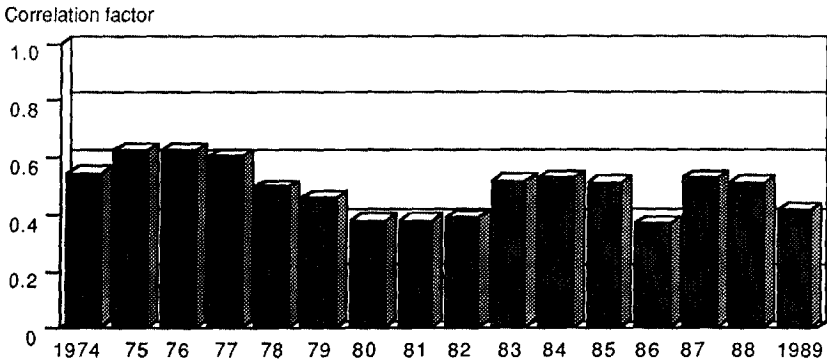
- Composition of industry sectors
- Economic policies
- Political cycles

Specialization vs. integration

- Declining correlation between U.S. and non-U.S. markets since 1976 increases diversification potential.

Correlation between EAFE and the S&P 500

(Five-year average using US\$ returns)

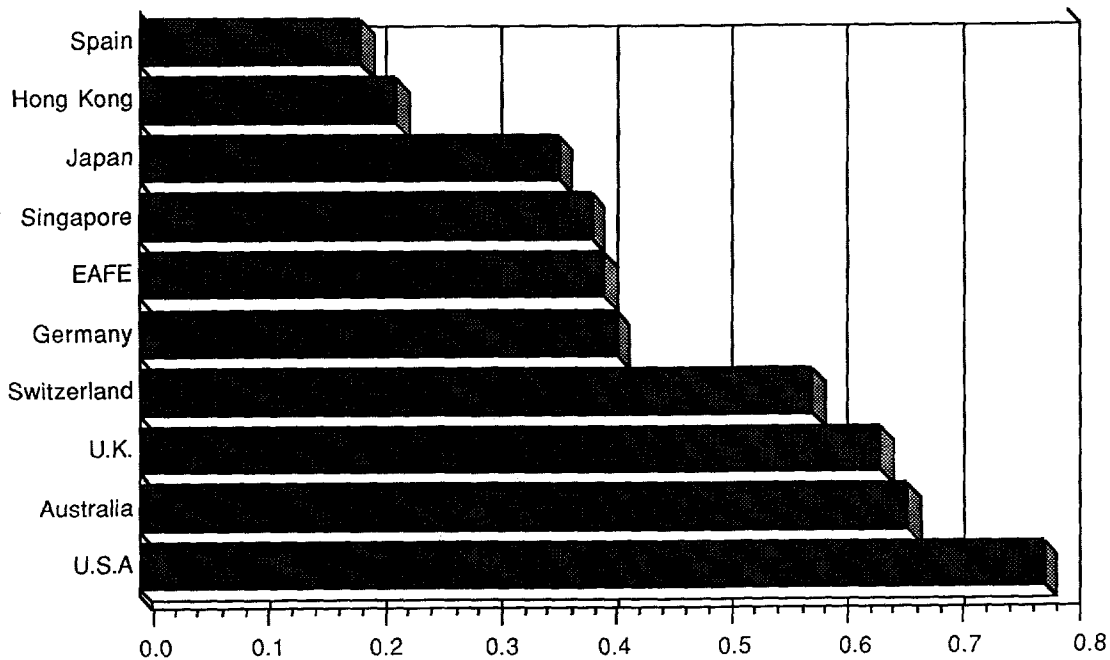


as of 12/31/89

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# DIVERSIFICATION

## Correlations with Canadian Equity 1983-1989

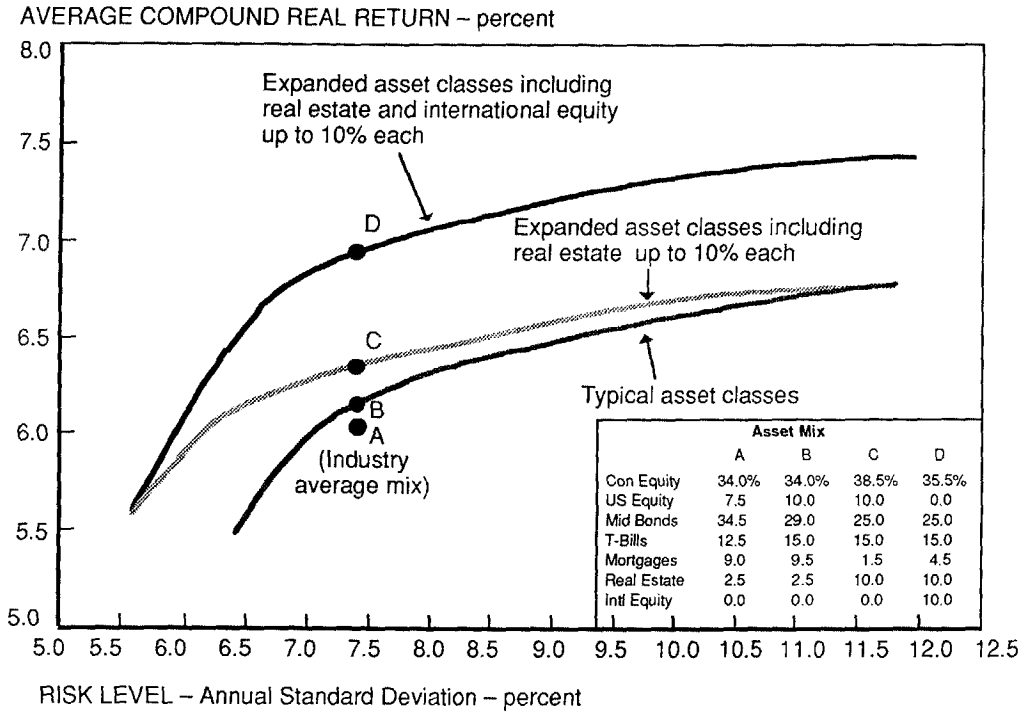


1.0 signifies perfect correlation and therefore no diversifying power.

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CHART 3

**EFFICIENT FRONTIERS – BENEFITS OF DIVERSIFICATION**  
**Canadian Experience 1979-1988**



Portfolio A is the 10-year average asset mix of Canadian pension funds as estimated by TPF&C. Portfolio B lies on the efficient frontier for the five "traditional" asset classes plus 2.5% in real estate. B carries the same risk as A, but would have earned 0.1% per annum higher return through optimal diversification. By broadening diversification into real estate and international stocks, however, the efficient frontier moves upwards and to the left -- i.e. significantly more return per unit of risk. Thus, Portfolio C which includes 10% in real estate carries the same risk as Portfolio B, but would have earned an additional 0.2% compound annual return. Portfolio D, including 10% in both real estate and international equity, also carried the same risk, but would have outperformed Portfolio C by 0.6% per annum.



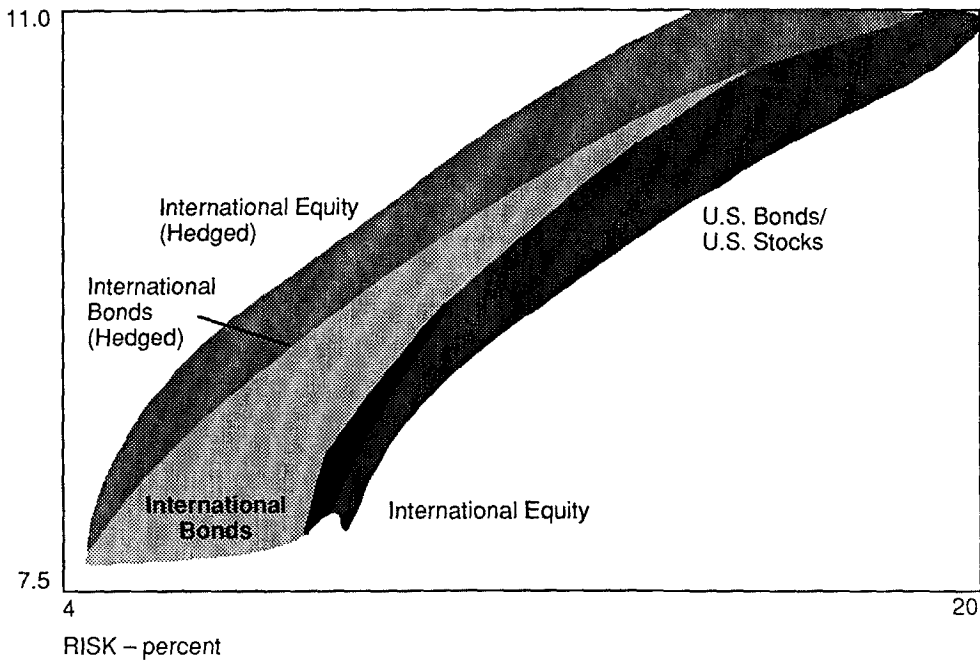
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## CHART 4

### OPTIMAL NORMAL PORTFOLIOS

#### No Constraints

EXPECTED RETURN



## PANEL DISCUSSION

much more efficient portfolios by investing internationally, but if you also look at hedging out currency risk, you can achieve even more efficiency in your portfolio.

Let's spend a moment discussing what relationships drive international markets. This is an extremely complex topic, but the one certain thing is that whatever holds today will change. If it didn't, we'd all be forecasting geniuses and making a lot of money. Over the past 10 years, models that compute relative values of financial assets have had some success in market timing. This was the topic of a panel discussion at last year's SOA Annual Meeting. In such a case, one is looking at the value and risk relationships among stocks, bonds, and cash within one national boundary. Certain equilibrium relationships will tend to hold over long time frames because investment funds can flow relatively freely from one type of asset to another depending on the expected risks and returns involved.

In the past, such approaches have not worked well when applied across national boundaries. This is due in part to the fact that funds could not and did not flow as freely to competing investment opportunities across borders as they did within one country. This being the case, you could easily end up with a higher valuation for the Japanese stock market than the U.S. stock market in an environment where large amounts of capital in Japan were competing for a limited supply of investment opportunities. From 1980-89, one could easily observe that the Japanese equity market was overvalued by most valuation techniques relative to the American market. However, during this period the more important relationship was the valuation of Japanese equities relative to Japanese fixed income and real estate. In fact, most global managers underperformed the EAFE index drastically during the 1980s, due in part to the fact that they continually assumed that the relative values among world stock markets did not substantiate the high valuations in Japan. Unfortunately, the overriding influence was the value of Japanese stocks relative to other investment choices in Japan and also the vast amounts of money that were pouring into Japan from trade surpluses.

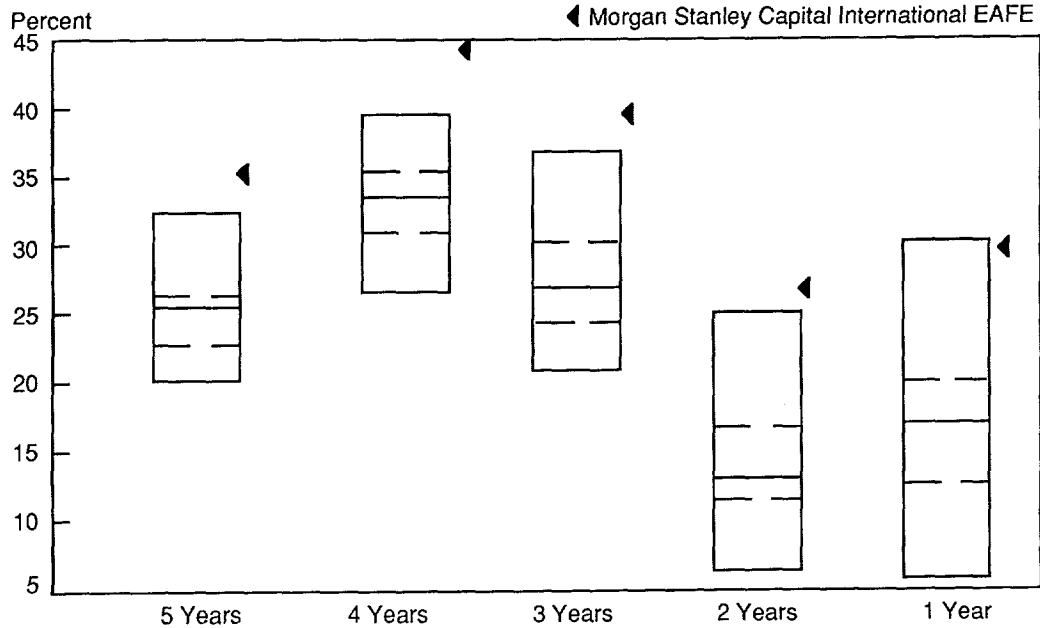
Just to show you the extent of the misjudgment here, Chart 5 shows a universe of international equity managers compiled by the Frank Russell Company over the five years ending December 31, 1988. The hash mark is the EAFE index, and what we see is that there were virtually no international equity managers in this universe that outperformed the EAFE index over that time. The same holds true if you look at other universes such as the Intersec Universe. Over the five years, the cumulative underperformance by the median manager was 190% compared with the EAFE Index. This was largely due (about 50%) to a dramatic underexposure in Japan by international money managers over the time period in question. One could argue that the recent correction in the Japanese stock market was due in part to the fact that as investors become more globalized; the valuation of stock markets relative to each other is going to become more important than was the case in the past. Certainly, as the barriers to the free flow of investment funds around the world are removed, that is precisely what you would expect.

The world is very much evolving into three economic or trade zones: Europe, North America, and the Pacific. As barriers come down within these zones, financial markets will become more and more interlinked. Moreover, I believe it is inevitable that barriers to the free flow of trade and investment funds among the three economic zones will

# NON-U.S. EQUITY PORTFOLIOS UNIVERSE QUARTILE RANGES

## U.S. Dollars Universe Data

Active managers vs. EAFE Index  
 Periods ending December 31, 1988



Over past five years, median active manager has underperformed EAFE Index by 190% (cumulative)

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## PANEL DISCUSSION

progressively disappear, making the equity and fixed income markets truly global in nature.

Finally, before turning the discussion over to Tony, I want to give an example of a fixed income investment strategy that demonstrates why understanding relationships among global markets can be beneficial to investors whether they're pension funds or insurance companies (Chart 6). This example is from the perspective of a Canadian investor, but you could come up with similar examples for other countries. What we have here is a yield curve for Government of Canada bonds and U.S. treasuries. I have plotted duration along the horizontal axis and yield on the vertical axis. The top curve shows the approximate shape of the Canadian yield curve over much of the last two years, while the bottom is the approximate shape of the U.S. yield curve over the same time period. Now, those curves have reshaped somewhat through that period, but the American curve has been essentially flat to modestly inverted, at times modestly positive. The Canadian curve has been sharply inverted through the whole period. Now, suppose that you held some long Government of Canada bonds in your portfolio. Is there an alternative strategy that you can develop here that would give you a superior return with a similar risk level? In fact, there is such a strategy. What you could do would be to replace your long Canada bond position with an equal position in a U.S. Treasury bond futures contract that will give you the same duration. You still have the cash because you don't have to have any cash in a futures position except for margin. You take the cash, and you invest it in Canadian Treasury bills. Now, I want you to look at the yield spreads here before we go to Table 4. You see at the short end the cash yield between Canada and the U.S. has about a 5% spread, while at the long end the spread is about 2% which is the historical norm for U.S./Canada interest rate differentials.

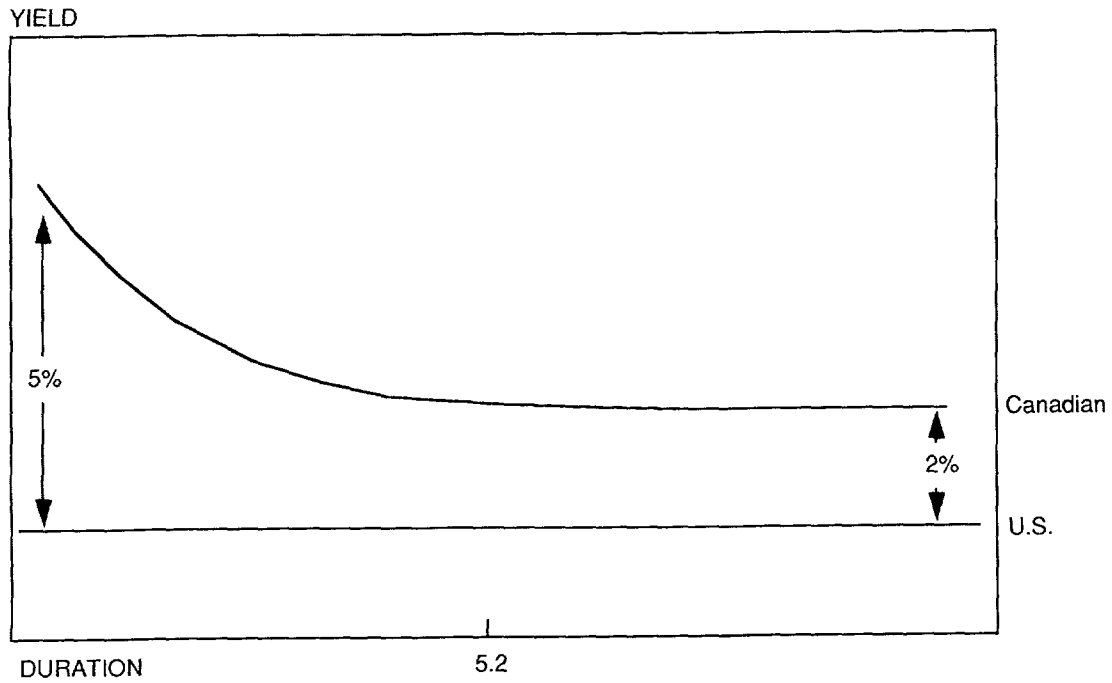
TABLE 4

Portfolio

	#1 Long Canadas	#2 T-Bills (CCA.) & U.S. T-Bond Future
Duration	Same	Same
Currency	CDN \$	CDN \$
Yield	---	# 1 + 3%

What are the characteristics of these portfolios? First of all, Portfolio 1, is the direct investment in long Canada bonds. Our second portfolio is Canadian Treasury bills plus a position in U.S. T-bond futures. Both portfolios have the same duration. Both positions are in Canadian dollars. That might not be immediately obvious, but if you think about it, in the second portfolio you're holding all of your cash in Canadian Treasury bills or equivalent cash instruments. So, you're holding Canadian dollars. Your U.S. exposure is limited to the gain or loss on a daily basis on the U.S. T-bond contract. Gains or losses are marked to market daily. Therefore, you're not exposed to the U.S. dollar significantly at all. Finally, what will be the yield differential between the two portfolios? Well, in the second portfolio, we're going to earn a yield approximately equal to the yield of the long Canada bonds plus 3%. The reason for that is that the

# YIELD CURVES



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CHART 6

Canadian

U.S.

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assumption in pricing the futures contract is that you can earn the U.S. cash rate. If we invest in Canadian cash, we have a 5% yield pickup. We then have to take off 2% for the spread between long Canada bonds and long U.S. bonds. We still end up with a 3% differential with roughly the same risk characteristics. When you look at yield differentials of this magnitude, it will be of interest. There are a few modest risks involved in this that I won't go into at this point.

There are several interesting observations one can make from this example. First, if one is aware of what is going on in the global fixed income market, strategies can be devised to take advantage of anomalies on a relatively risk-free basis. Second, the effect of investors taking advantage of situations such as the one described further links global financial markets. If enough investors followed this strategy, the Canadian yield curve would be forced into a shape much more similar to the American curve. The implication is that it is becoming much more difficult for any country to manage domestic interest rate policy independent of what is happening in the rest of the world. A policy such as that adopted by the Bank of Canada in forcing up short-term interest rates creates opportunities for investors with an international perspective.

I hope that I've been able to provide you with some interesting and perhaps useful ideas. In any event, I will now turn you over to Tony Dardis who will talk further about the justification for global investing in a more quantitative way and will present a simple model for coming to grips with the global asset allocation decision.

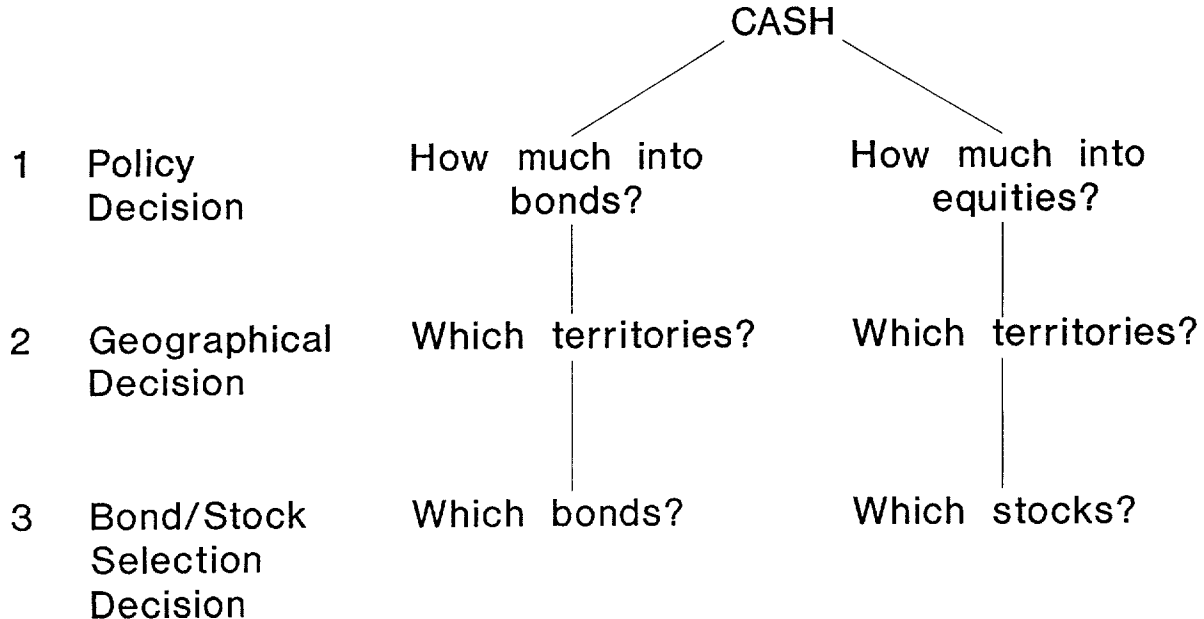
Tony was born and raised in London, England. He was educated at the University of Leeds, and he currently has one exam to go to become a fellow of the Institute of Actuaries. He has worked with the W. I. Carr Group in the stockbroking business in London where he was a quantitative analyst and economist. He's a published author in the investment field. He is currently working with the Victory Reinsurance Company.

**MR. TONY DARDIS:** I'll be saying a few words about building quantitative models for global equity investment strategy.

I've tried to pitch the talk at a level that could be easily understood by someone completely new to the subject, while at the same time giving the experts something to think about. In this respect, I think the most important thing is to promote discussion, and that means discussion between actuaries and nonactuaries and investment people and noninvestment people.

My starting point is that the strategic decision to be solved is: What territory should I invest in, given that I wish to invest in equities? So, I'm not interested in the equity/bond/cash or other split of a portfolio or in the question of individual stock selection. So, we're looking at what might be regarded as the second big decision that has to be made in the decision process which is typically followed by an international fund management team. First, cash is allocated to either bonds or equities -- what I call the basic policy decision (Chart 7). Second, bond money is allocated to the various international bond markets and, what we're interested in, equity money is allocated to the various international equity markets. I call this the geographical decision. Finally, the individual bonds and stocks are chosen -- the bond/stock selection decision. This will be

# International Fund Strategy Tree



## PANEL DISCUSSION

recognized as a top-down approach rather than a bottom-up approach. Under the bottom-up approach, we choose the most undervalued stocks and bonds regardless of what their home is, and we completely miss the geographical decision.

We can't go any further without setting some objectives. It is generally accepted that the broad objective of investment policy is that the portfolio should be constructed with regard to the nature of the liabilities, and, subject to this, that the objective should be to maximize the rate of return by investments which involve an acceptable level of risk. Now, I'm going to assume that we don't have any liabilities at all, and, therefore, all funds are available for investment.

I think it's important to be quite clear about what is meant by risk. It's generally accepted that investment risk is defined as price volatility. This is the definition that I'm going to stick to, and I think it's quite acceptable, given that we assume the investor does not have any liabilities. However, I do mention in passing that a number of recent studies have questioned this traditional approach where there are liabilities to take into consideration, specifically that risk must be equated with the degree of mismatching between assets and liabilities.

If it's accepted, then, that the objective of investment for a liability-free investor is to trade off risk and return as successfully as possible, then there is strong justification for global investment as a means of reducing risk without a reduction in return. As Jim hinted at in his talk, this arises because there is a far from perfect correlation between the returns of different regional markets. For example, using indices converted to U.S. dollar terms, for the period 1984-89, the correlation between the U.K. market and the U.S. market was 0.617 and between the Japanese market and the U.S. market it was as low as 0.247.

At this stage I want to mention passive global investment. Investing simply in a world index might be thought of as the ultimate in global diversification and hence risk reduction. The index fund is really the basic "quantitative" product, and it's by far the most widely marketed. Domestic index funds began in the U.S., and something like \$150 billion of domestic portfolios are now indexed. Usually they track the S&P 500, but there are others. Passive management of this kind is beginning to take off in the U.K. where around 20 billion pounds is now linked to the Financial Times/Actuaries All Share Index. Global indexing has taken longer to develop, but the necessary models are now available from firms such as Barra and Quantec. It's believed around \$15 billion is now tracking global indices for U.S. clients.

How can we quantify the success of the index funds in terms of our risk/return trade-off objective? And can we do better than the index funds? A good framework within which to analyze the risk return trade-off is to use the ideas of modern portfolio theory or MPT. MPT was developed in the U.S. during the 1950s, and its application has become increasingly wider as computer data storage and handling facilities have become more powerful. The area of MPT that I'm interested in is the idea of establishing mathematically optimal portfolios, i.e., the derivation of possible portfolios which give the maximum expected returns for given levels of risk.



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I've examined some historic global risk/return scenarios using monthly data from the Financial Times/Actuaries or FTA world index. The database is restricted by the fact that the index has only been published in the financial press since March 1987. The decision to use the FTA index as opposed to the Morgan Stanley Capital International World index, which has been around for many more years, is based on the same reasoning as that used by the founders of the FTA index in justifying the need for a new world index in the first instance. That reasoning was that many analysts were not entirely satisfied with the Morgan Stanley index as a measure of international equity markets, primarily because it included certain constituents which were not available to institutional investors. The data I've collected are the U.S. dollar values of the index for each of the different regions. Thus, the analysis is in terms of returns to a U.S.-based investor, including the currency return.

In Table 5, I've shown the annualized monthly returns and the risk for each territory for a U.S.-based investor for the period from March 1987 to July 1990. The returns did not allow for any income from dividends. This is a failing of the model but a result of the fact that the FTA world index does not yet publish the dividends declared by companies accumulated from the beginning of each calendar year as per the domestic FTA All Share index. Thus, given the limitations of the data, it is not possible to compute a true total return. Now, as we'd expect, the figures generally reflect intuitive understanding that if we take on more risk, we get more return. The important feature of these results for our purposes is that by moving out of any of the domestic-specific indices and into the globally diversified world index, the U.S.-based investor always reduces his risk. Moreover, he still achieves a reasonable average return; only just below the U.S. and considerably better than Japan and Canada, among others. But the big question that really interests the global investment manager is: Can I beat the index and thus is there any scope for an investment policy which adopts market weightings different from that of the index?

In Chart 8, I've plotted out the risk/return combination for some of the main indices from the FTA world index. These indices are the U.S., the U.K., Japan, Europe (excluding the U.K.), and the Pacific (excluding Japan). If we alter the proportions of each of these indices that we hold, then we can derive a curve which bounds the set of all possible portfolios and shows for a given level of risk the maximum possible return. In MPT, those portfolios which maximize the return are known as efficient portfolios, and the curve is known as the efficient frontier. Clearly, none of our "basket" indices, including the overall world index, is an efficient portfolio, although the Europe (excluding the U.K.) index is extremely close indeed. There is clear justification for a global investment strategy which is not just purely passive in its approach but weights its portfolio across territories. In other words, by adopting market weightings different from those in the index, it's possible to beat the index without taking on additional risk.

Now, it's a relatively straightforward process for a computer to derive what weightings will give the optimal portfolio. A linear programming package will typically be used, and my article goes into this in a little bit more detail. But all this analysis is purely historic, and none of us need telling that what might have been the optimal mix in the past is going to be the optimal mix in the future.

PANEL DISCUSSION

TABLE 5

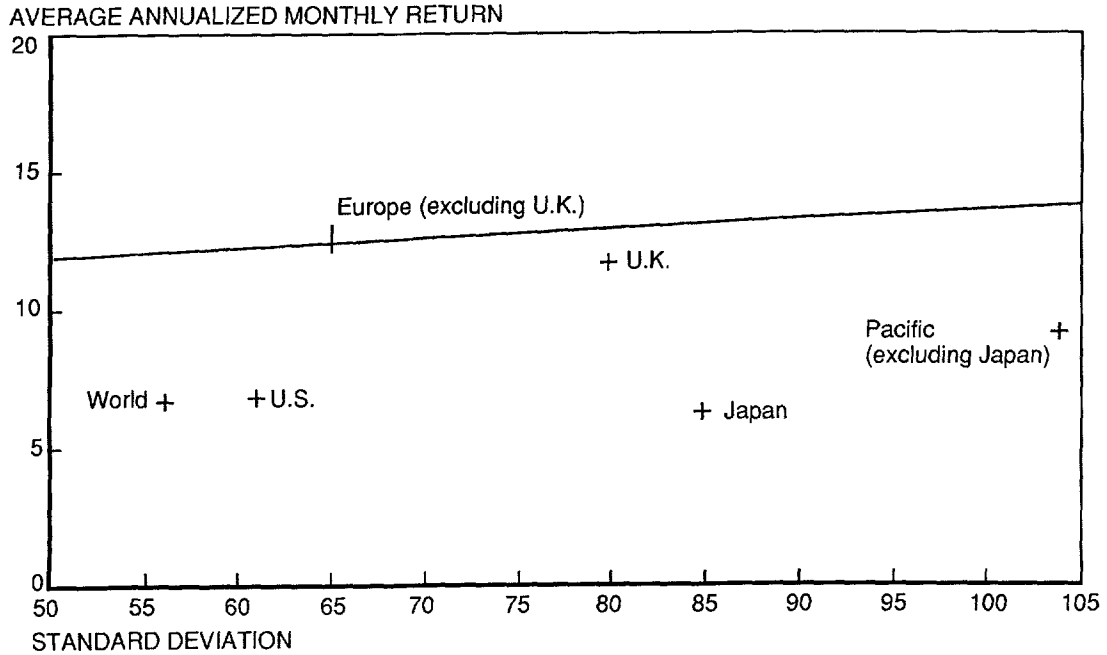
**Risk/return relationships for FT/A World Indices  
March 1987 - July 1990\***

	Average annualized monthly return (%)	"Risk" (standard deviation)
Australia	11.18	108.71
Austria	37.55	97.11
Belgium	12.78	79.07
Canada	3.90	62.77
Denmark	28.64	61.40
France	12.33	83.83
West Germany	16.30	81.58
Hong Kong	16.21	122.03
Ireland	14.70	85.98
Italy	4.09	71.85
Japan	6.30	85.15
Malaysia	24.84	106.56
Mexico	56.70	189.66
Netherlands	9.77	62.92
New Zealand	- 5.18	115.42
Norway	27.86	102.55
Singapore	21.70	98.28
South Africa	7.52	110.17
Spain	16.57	72.17
Sweden	24.44	76.54
Switzerland	4.96	72.98
U.K.	11.79	80.27
U.S.A.	7.06	61.32
Europe	11.55	63.61
Pacific Basin	6.31	81.94
Euro-Pacific	7.90	66.25
North America	6.84	60.95
Europe (excl.UK)	12.48	63.84
Pacific(excl.Japan)	9.06	104.33
World (excl.US)	7.67	64.80
World (excl.UK)	6.47	55.59
World (excl.S.Af.)	6.93	56.39
World (excl.Japan)	8.54	58.89
World	6.90	56.29

\* The results for Finland and the Nordic countries are not directly comparable to other territories because these indices were not published until significantly later than March 1987. These territories have been excluded from the calculations. Although the Europe (excluding UK) and Pacific (excluding Japan) indices were also published after this date, the effect is merely the loss of three data points which is not significant for the analysis.

**RISK/RETURN ANALYSIS**  
**FT/A World Index March 1987-July 1990**

2063



GLOBAL INVESTING  
CHART 8

## PANEL DISCUSSION

Therefore, I'd like now to briefly touch on how this kind of risk/return model might be given some sort of predictive capability. If the analysis so far is to have any predictive capability, the fund manager needs to be in possession of two pieces of information for each market in which he is considering investing: first, estimates for the future returns on the market and second, the future risk on that market. In MPT, it is usual to assume that risk remains constant, subject to adjustments for trends or statistical variations from the true, underlying values. This is a reasonable assumption when looking at the short term, perhaps anything up to a five-year period, but in the long term it would not be appropriate to view risk as a constant, nor would it be appropriate if it were known that certain structural changes were about to take place in a particular market. For example, the investor who failed to foresee the implications of the dramatic removal of exchange controls in a number of markets in the late 1970s and the early 1980s would have found his assessment of future risk soon invalidated. Having said all this, for the purposes of this talk, I'm going to leave aside the problem of assessing future risk since I'm only going to look at what might happen one year ahead. Thus, I assume that risk for each territory remains as per the recent history.

How, then, can quantitative techniques be used to model future return expectations for the year ahead? I've already mentioned that global investment can be justified on the grounds of there being a far from perfect correlation between the returns of different regional markets. In other words, there is strong empirical evidence that it is national influences which affect share prices with external factors having a smaller influence. Thus, in building a model of future returns, each region should be treated on its own merit, independently of what is happening in other markets. It's accepted that this view is certainly less convincing now than it was, say, 20 years ago. The recent removal of controls in the movement of capital and the arbitraging of stocks quoted on more than one exchange has certainly served to make national markets more susceptible to international influences. However, the statistical evidence demonstrates that internal factors remain the most important influences on a market. If, the global fund manager is to assess each market on its own merits, his assessment of the global scene is little more than an extension of his assessment of each domestic market in isolation. He does need a model which is consistent over all the markets in which he is considering investing.

One simple model is to use a dividend discount approach. In theory, an equity only has value for its expected flow of future dividend income or its scrap value. Thus, the value of an equity should be equal to the present value of the prospective dividends paid on that equity, discounted at the appropriate discount rate. Now, this principle can be applied to markets as a whole. Thus, the value of a market index can be regarded as simply the present value of the prospective dividends which will be received by holding the basket of stocks (in the correct proportions) which make up that index.

The principle can be expressed in terms of some simple formulas:

$$P = D \sum_{t=1}^{\infty} \frac{(1+g)^t}{(1+i)^t} \quad \text{or} \quad P = D \frac{(1+g)}{(i-g)} \quad \text{or} \quad g = \frac{(i-d)}{(1+d)}$$

## GLOBAL INVESTING

The first expression expresses the value of the index (P) in terms of the current gross "dividend" received by holding the index (D), the expected future annual growth rate of dividends (g), and the valuation discount rate (i). Now, this expression assumes that the index has just gone ex-dividend, that dividends are payable annually into infinity, and that the annual dividend growth rate is constant. The valuation discount rate should relate to the opportunity cost of investing in equities. Normally this is regarded as the yield on a long-term, risk free asset, for example, long-dated government bonds, plus an addition to the yield to allow for risk. This allowance for risk, or the long-term "risk premium," is historically around the order of 8% for the U.S.. Strictly, long-dated bonds are not entirely risk-free, and a reduction of 1% to the required risk premium should be made for this. Therefore, it is more appropriate to take a historic risk premium of 7%.

The second expression is merely a simplification of the first expression.

Now, since the market values of D, P, and i are all known at the valuation date, we can rearrange the formula so that it can be used to derive g, and this is the third expression shown. In this expression, d is quite simply D divided by P, i.e., the gross dividend yield, and g, therefore, effectively represents the market expectations as to what future annual dividend growth rates will be.

As a quick, practical example of the use of this simple model I've looked at the U.S. market as at August 28, 1990 (Chart 9). The value for the gross dividend yield (or d in our formula) is 3.78%, and the benchmark government bond yield is 9.04%, leading to a value of i of 9.04% plus our 7% for risk premium which is 16.04%. This gives an implied growth rate in dividends of 11.81%.

CHART 9  
U.S. Data 28th August 1990

Gross dividend yield (d)	3.78%
Benchmark government yield	9.04
Bond yield plus risk premium (i)	16.04
$\text{Implied growth rate (g)} = \frac{i-d}{1+d} = 11.81\%$	

This in itself is an interesting piece of information. When actuaries perform valuations on pension schemes, one assumption they will make is the long-term outlook for real dividend growth. Now, if the market is anticipating long-term dividend growth of 11.81%, then with future inflation assumed at, say, 4.5% per annum, the market is actually saying that it anticipates real growth in dividends of 11.81% less 4.5%, i.e., 7.31%.

In fact, recent history would suggest that this is not an unreasonable assumption for the immediate future, anyway, although as a long-term expectation it is probably a little optimistic. Comparison of the implied real growth rate of 7.31% with that anticipated by a sample of top stockbrokers would suggest that even in the short term the market

PANEL DISCUSSION

expectation is optimistic. From the figures shown in Table 6, you'll notice that a negative real growth rate has been forecast for 1991. I think it would be fairly interesting (and probably more meaningful for a long-term assessment) to compare the implied growth rate figure with the consensus of opinion among pension fund actuaries.

TABLE 6

	Annual Dividend Growth Rate on the S&P 500 (1)	Inflation (annual growth rate of Consumers Price Index) (2)	Real Annual Dividend Growth (1) - (2)
1987	7.0%	1.1%	5.9%
1988	11.0	4.4	6.6
1989	12.8	4.7	8.1
1990(F)	7.7	4.6	3.1
1991(F)	4.0	4.5	-0.5

F = consensus forecast amongst top stockbrokers

Taking things a little further, we can now say that the value of the index in a year's time ( $P'$ ) will be given by a formula of the type shown in the first expression (Chart 10). In this expression  $g'$  is the actual annual growth rate in dividends during the year,  $g''$  is the market's expected future annual growth rate in dividends at the end of the year, and  $i'$  is the valuation discount rate at the end of the year.

CHART 10

$$P' = D(1+g') \frac{(1+g'')}{(i'-g'')}$$

$$\text{so that } (1+r) = \frac{P'+D(1+g')}{P} = \frac{(1+g') \frac{(1+g'')}{(i'-g'')} + (1+g')}{\frac{(1+g)}{(i-g)}}$$

$$\text{for } g'' = g \text{ then } (1+r) = (1+g')(i-g) \left[ \frac{1}{(i'-g)} + \frac{1}{(1+g)} \right]$$

Thus, if we write  $r$  as the annual rate of return on the index during the year, then we can derive the expression for  $(1+r)$  as shown by the second formula.

## GLOBAL INVESTING

If we assume that over the period of a single year it is unlikely that the market's expected long-term future annual growth rate of dividends will change dramatically, then we can assume  $g' = g$  and we get a formula for  $(1 + r)$  of the type shown in the third expression.

Thus, in order to derive an estimate for our expected return on the index over the next year, we only need to make an assumption about  $i'$ , the valuation discount rate at the end of the year, and  $g'$ , the actual annual growth rate of dividends during the year.

So, we now have a basic framework within which we can objectively assess the outlook for an index in the year ahead. For example, a fund manager might have the following thoughts on the U.S. market: First, I cannot see dividend growth being as high as the market's long-term expectation of 11.81% in the year ahead. I believe that 10% is probably the best I can achieve, although I don't expect anything, say, under 8%. Second, I can't see a dramatic shift in long-dated yields during the year since inflationary pressures have not been entirely solved. The lowest yields are likely to go is 8.5%. They could go up to, say, 9.5%

Table 7 shows how that fund manager's hunch can be expressed in terms of  $i$  and  $g$  from our previous formulas on an optimistic and pessimistic basis. Feeding these values into our formula for  $(1 + r)$  brings out rates of return of 30.26% on an optimistic basis and 1.49% on a pessimistic basis. Now, this might be thought of as being quite a large range, but the figures represent the extreme limits of the fund manager's thoughts. He might quite reasonably then assume a rate of return for modeling purposes somewhere in the middle of the two extremes, giving a quite reasonable average expectation of, say, around 15%.

TABLE 7

	Optimistic Basis	Pessimistic Basis
Actual annual growth rate in dividends during the year ( $g'$ )	10.00%	8.00%
Valuation discount rate at the end of the year ( $i'$ )	15.50	16.50
Estimated future annual return ( $r$ )	30.26	1.49

This model at the very least provides a basic framework within which the fund manager can begin to quantify his subjective hunch. It's got the advantages of ease of understanding, and, above all, by relying so much on the personal judgment and expertise of the fund manager, it does not allow the model "tail" to wag the fund manager "dog."

Returns can be forecast in the way I've shown on a variety of bases for all the countries making up the FTA world index. Allowance would then have to be made for currency movements to determine the expected returns to a U.S.-based investor, and, of course, we could model currencies themselves, but that's another story altogether. Finally, the results may then be used to rerun the MPT model to derive a set of optimal portfolios

## PANEL DISCUSSION

for particular levels of risk, thus giving our initial analysis the predictive capability that we had hoped for.

**MR. CREIGHTON:** I'm sure that you have a number of in-depth questions to ask Tony, and we could all argue about the intricacies of his approach for hours, but before we do that, we're going to listen to Blake Grossman. I should mention now that Tony is a member of the Institute of Statisticians. He is also a member of the Society of Investment Analysts in Britain as well as a registered representative for the London Stock Exchange.

Blake is now going to state some of the intricacies of actually investing in world equity markets. Blake Grossman is Senior Vice President and Co-Head of the Portfolio Management Group at Wells Fargo Nikko Investment Advisors. They are a global index fund manager with approximately \$80 billion, U.S., under management, and that I believe makes them the world's largest investment counseling organization. Blake joined Wells Fargo Nikko in 1985 after receiving his master's in financial economics from Stanford University where he studied under Bill Sharp who is certainly one of the giants in the field of portfolio theory. Since 1986, Blake's main responsibility has been international equity strategies for clients of Wells Fargo.

**MR. BLAKE R. GROSSMAN:** I'm going to give an overview of some of the key factors that underlie the growth of global investing from the vantage point of a U.S. investor, because most of our clients are U.S. based; then I will take a brief look at some of the problems or risks that are associated with investing outside the U.S.; and finally I will look briefly at currency hedging. I thought I would start by answering the question, "Just what has been the growth of international investing?"

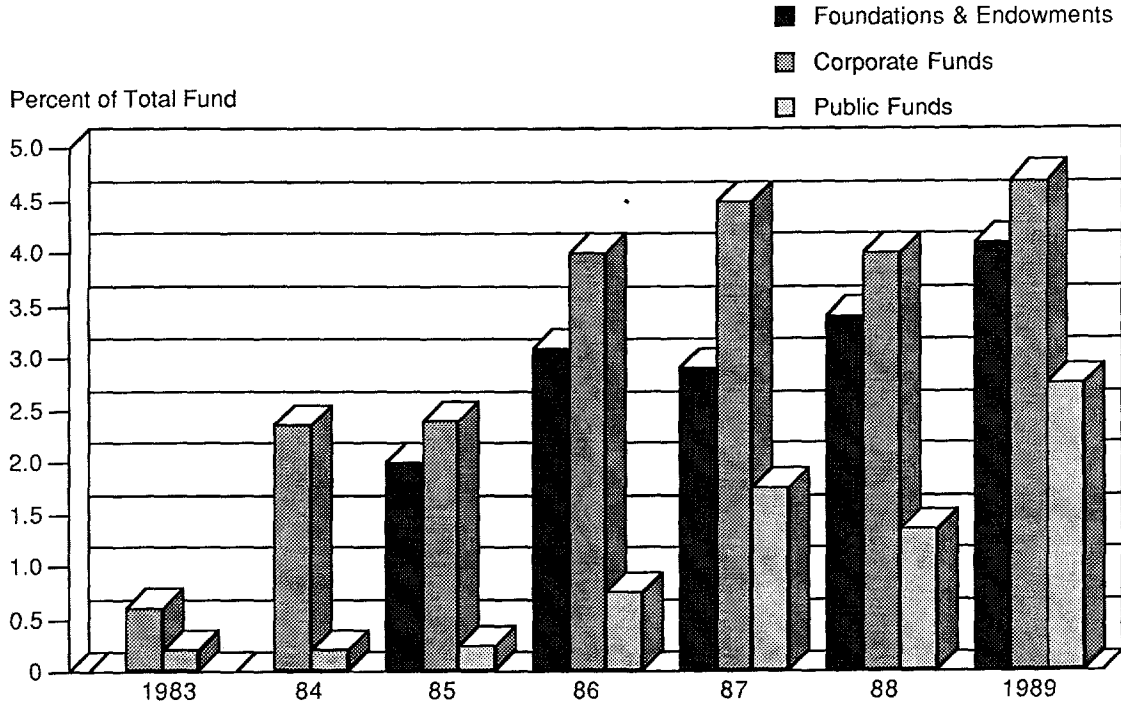
Chart 11 shows the percentage of the total fund invested in international equities for the average corporate pension fund, public fund, as well as foundations and endowments in the U.S. These are numbers that Greenwich Associates routinely comes up with. In going back to the early 1980s, it was rare to find a U.S. fund that had any kind of a significant allocation to international equities, but starting about the mid part of the last decade, there was a change. Suddenly, international investing became quite popular. There was a pretty big move to diversify globally, and the main reason for this is the growing acceptance of and comfort with the arguments that Jim and Tony just discussed that is, the strong diversification benefits of investing outside one's own borders.

In fact, I just recently met with one of our U.S. corporate clients that has now set a new target mix of 50% of their total equities to be invested internationally, and they expect to reach that in a few years. That's the kind of allocation or idea that would have been considered really on the fringe, or something only an investment fanatic would have done, let's say, seven or 10 years ago, but that's very much the direction things are moving in. There are many reasons that global investing has become much more popular; some of the key developments that have made this possible are the following: global trading; technology; globalization of U.S. broker/dealers; custody and settlement; and derivative instruments.



# THE GROWTH OF INTERNATIONAL INVESTING

## Average Allocation to International Equities



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## PANEL DISCUSSION

The first thing I'm going to focus on is the revolution in global trading, and I think the numbers in Table 8 can speak much better to that.

TABLE 8

### Global Trading

1985-1990	Growth of Trading Volume	Market Appreciation
Japan	323%	351%
United Kingdom	288	134
Germany	180	79
France	330	168
Italy	103	189
Australia	325	266
U.S. (NYSE)	68%	70%

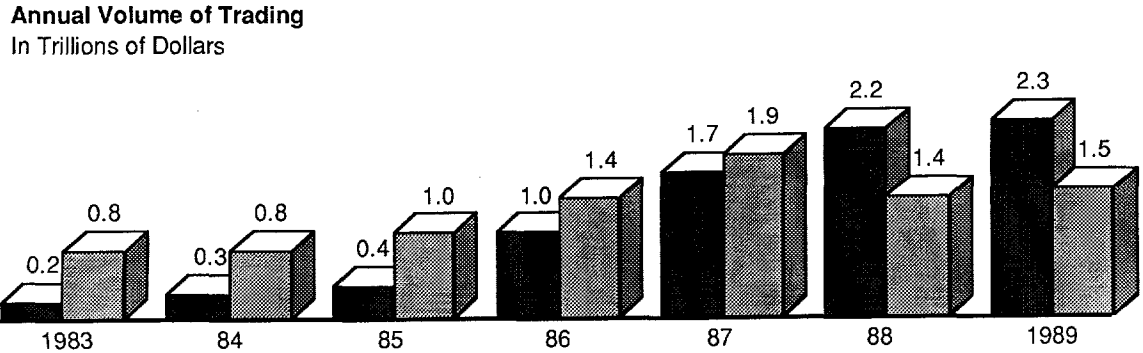
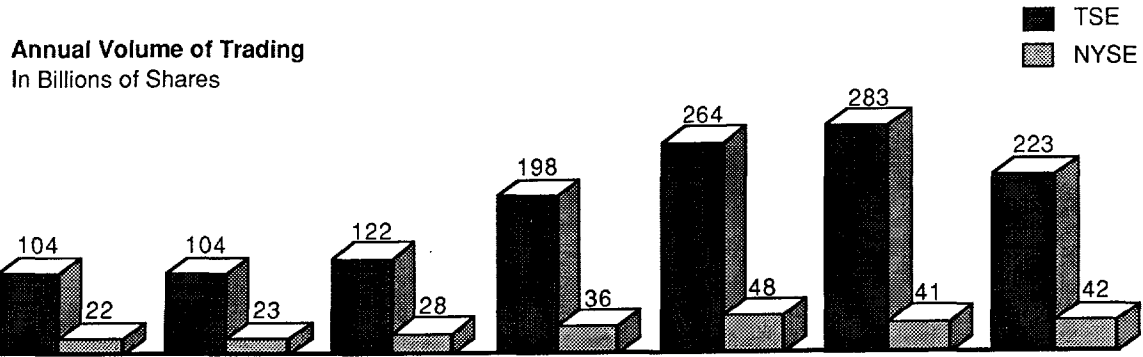
Let me skip ahead here and show what the growth in trading volume has been since 1985 in many of the major markets around the world. As you can see, in Japan, the U.K., France, and Australia, the growth in trading over this period has been close to or exceeding 300%. There's been a significant jump in the volume of trading that goes on, and this has created the liquidity that many U.S. investors look for. That's one of those interesting situations: liquidity begets trading. Until there's sufficient liquidity in trading volume going on, foreign investors might be afraid to enter a market if it doesn't have the low trading cost, the ease of entry, and the ease of exit that they look for in a market. Meanwhile over this same period, the trading volume in the U.S. has gone up by only about 70%. There's been a significant catch-up by the major markets around the world.

In fact, let's turn now and look at the largest stock market in the world, which is no longer the U.S. exchange, but Tokyo (Chart 12).

The top graph in Chart 12 shows the trading volume year by year for both the Tokyo Stock Exchange (shown in the shaded bars) and the New York Stock Exchange, and the lower graph shows the annual volumes of trading in trillions of dollars. Tokyo has long traded many more shares than trade on the New York Stock Exchange, but this isn't surprising given that most stocks on the Tokyo Exchange are less than \$10 a share in price. What's been really remarkable is the increase in the trading volume on the Tokyo Exchange, going from about \$400 billion in trading activity in 1985 (compared with about \$1 trillion in New York) to \$2.3 trillion in 1989, a year in which the New York Stock Exchange traded about \$1.5 trillion. So, the largest, most active stock exchange is now, in fact, the Tokyo Exchange.

This rise in global trading has made it much easier for U.S. investors to access these markets and to do so at lower cost. There's also been a big change in the technology available for U.S. investors or really any investors investing in these markets.

# TOKYO SHOKEN TORIHIKIJO ... the world's most active stock exchange



## PANEL DISCUSSION

I think the next two points are really very much interlinked, with technology providing the foundation for the major push that many U.S. broker/dealers have made to expand their operations globally. In fact, over the period since 1985, we've seen many of the major U.S. broker/dealer firms become truly international firms, with companies such as Morgan Stanley, Goldman Sachs, Salomon Brothers, and Merrill Lynch leading the charge. Many of these companies now have 20 or maybe even 25% of their employees and revenues based outside the U.S., and this has had several important impacts for U.S.-based investors. One has resulted in the export of U.S. investment technology and trading and investment ideas to these markets around the world, and that has created an environment in those markets in which it's now quite easy for a U.S.-based investor to invest and trade the same way that they're accustomed to doing in the U.S. For example, the use of index funds, something that Tony talked about briefly, is a very popular investment strategy here in the U.S. There's well over a hundred or \$150 billion currently indexed in the U.S. using indexes like the S&P's 500, and as U.S. broker/dealers have expanded into these other markets, they have brought with them the technology to make it easy to trade broadly diversified baskets of stocks or index funds in these markets. And that was quite attractive to North American-based investors who maybe didn't know exactly which foreign companies or industries they wanted to invest in, but instead wanted to get broad market exposure.

So, the brokers made it quite easy for them to invest on an indexed or package basis, much the same way that they do in the U.S. So, this made it all that much easier for them to diversify outside their own borders, because international investing just started looking and feeling a lot more like widely used U.S. investment strategies. Also, the U.S. broker/dealers made a big investment in their operations outside the U.S. and were looking for revenue to justify this. As a result, they joined the growing chorus of outfits in the U.S. that were making strong and very persuasive arguments in favor of global diversification. Now it wasn't only the pension consultants that were arguing in favor of global diversification. It was frequently the money manager and the brokers. So, there were many more voices out there arguing that international investing was a very prudent thing to do.

The custody and settlement practices around the world have improved quite a bit in the last five to 10 years, which has made it much less risky for U.S. investors to invest outside the U.S. While this is an area that still has some problems, which I'll mention later, it was a big barrier to international investing in the early part of the 1980s in many of the markets. For example, some of the smaller European and Far East markets were viewed as being quite risky not only because the trading might be difficult and illiquid, but also because you couldn't be sure what happened to your money after you invested. You weren't sure what happened to the securities. Were they safe? Were you going to get all the dividends and stock splits to which you were entitled? There have been big improvements here led by the growth in international investing.

Finally, there's the area of derivative instruments, primarily stock index futures. This is something that has only been an indirect source of much of the growth we've seen in the last five years, because few U.S. investors actively use stock index futures outside the United States. One of the reasons for this is legal barriers, because most of these stock index futures contracts have not yet been approved by trading by U.S. investors.

## GLOBAL INVESTING

However, approvals have recently become available for some of these contracts, and everyone expects them to be granted to most of the other stock index contracts in the near future.

Today there are stock index futures trading on virtually all the major equity markets in the world (Table 9). One of the glaring exclusions on this list right now is Germany, but there is a stock index contract that should be up and running in the near future in that market as well. The indirect benefit that these stock index futures have provided is that they have enabled the brokers to take advantage of liquidity in the futures markets in these countries in order to provide execution at lower cost than would otherwise be possible. There are many trading techniques that indirectly tap into the liquidity available in the futures markets. Looking into the future, we believe that as these stock index futures markets become more available to U.S. investors, they could well lead the next leg of the evolution of global investing. U.S. investors are now generally much more comfortable with the idea of investing in equities around the world than they were five years ago and will now be looking to do different things, such as enhanced strategies using futures or using futures markets and other derivatives to provide easier and lower-cost entry and exit into and out of the markets. This would facilitate the kind of asset allocation strategies that may result from the kind of work that Tony had reviewed.

TABLE 9

### Non-U.S. Stock Index Futures

Topix (Japan)
Nikkei-225 (Japan)
FTSE-100 (U.K.)
All-Ordinaries (Australia)
Hang Seng (Hong Kong)
TSE 35 (Canada)
CAC 40 (France)

Despite all this progress, it's certainly not the case that investing internationally is a completely perfect process today. There are some problems, costs, and risks that should also be considered. Starting with the cost issue, the average cost of investing outside the U.S. is still significantly higher than the costs for investing in the U.S. These costs have come down pretty dramatically in the last five years, but they are still higher. Trading costs are higher. There are also taxes that have to be paid when trading in many markets. Also, the management fees and custody expenses for an international equity portfolio are quite a bit higher as well. There are also risks that must be considered. Usually, from the investment manager's point-of-view, the risks get modeled as standard deviations. What's the volatility or the standard deviation of each asset class? And it's almost invariably the case that a diversified basket of international equities has a lower standard deviation than a basket of U.S. equities. So, from that standpoint, the risks appear lower, and as the previous speakers have indicated, combining an international equity portfolio with a U.S. equity portfolio leads to that diversification benefit that can significantly reduce the risk of an overall portfolio. But there are some aspects of risk that are unique to investing outside one's own borders. The first concerns the liquidity

## PANEL DISCUSSION

issue again, and despite a big increase in worldwide trading volumes, it's still the case that liquidity can be less predictable and somewhat more fleeting outside the U.S. than it is for trading on the New York Stock Exchange, and this is a risk that must be factored in. Then there's the area of political risk. If you're a U.S. investor investing in U.S. corporate stock, it's unlikely that some new political regime will come into power and expropriate those holdings from you, at least in this country. But if you're a foreign investor investing in another country, there always is that risk. There's a risk that a new regime will come in and decide to renationalize some industries and to do so at prices that are below the true market value for those enterprises. Although this isn't a risk that we think is a large one, it is a fundamentally different risk. It's not something you typically face when you're just investing within your own borders.

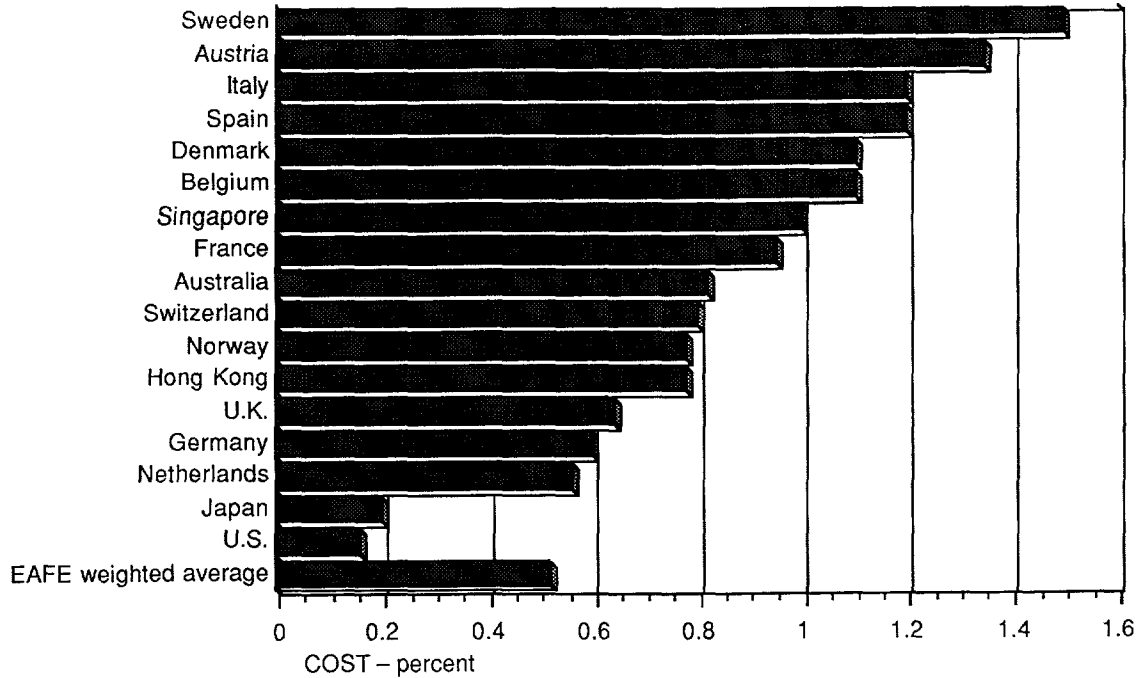
Getting good information on international equities is a lot more challenging than it is for U.S. stocks. If you're an active investment manager and you're looking to find companies that are undervalued in the marketplace, this can represent quite a challenge. Getting good earnings forecasts on those companies or good information on what the management is doing for the firm is certainly much more difficult. If you're not an active manager, if you're managing your assets on an indexed or a passive basis, then you don't have the problem with getting forecasts on the individual securities, but you still need information about the market as a whole. You need pricing information and information on dividends and corporate actions to effectively manage your portfolio. To provide an example here, for managing a U.S. fund you can do a quite adequate job with just one high-quality data source that provides information on prices, dividends, corporate actions, capital changes, etc. On the international side, it's unlikely you can find just one data source that has the accuracy that you need. In managing our funds, we rely on more than seven different data sources for international equities, many of them overlapping, in order to cross-check and weed out any inaccuracies. This process is getting easier, but it still requires much more work than it does on the U.S. side.

Finally, there's the back office side of the investment process -- the operational side. I mentioned before that the custody and settlement process has improved greatly in these markets, but there are still risks that are higher than those faced for investing in North American equities. These risks clearly get much greater as you get outside of the major equity markets. When you get into the emerging markets, it can be a fairly risky proposition just ensuring that your assets are held in custody in a safe manner and that you're getting full value for those securities whenever there's a dividend or a stock split.

Returning for a moment to the point about the costs for investing abroad, Chart 13 shows the standard quoted commission rates, including any taxes, for stock trades. These rates are for stock purchase trades in all of the major markets around the world, and they start at a high in Sweden, where it can routinely cost 1.5% to just go out and buy a stock on the Swedish Exchange. Moving down the list, fortunately the major markets, the U.K., Germany, Netherlands, and Japan, tend to have much lower costs. In Japan, costs have become quite competitive as a number of U.S. and European broker/dealers have set up large operations in Japan, and one can now trade at commission rates that aren't much higher than the roughly 0.1-0.15% that's routinely paid for U.S. equity trades. The last bar on the graph shows the weighted average for the EAFE index, where "EAFE" stands for the Morgan Stanley Capital International Europe, Australia

# COMMISSION COSTS FOR INTERNATIONAL INVESTING

## One-way Purchase Costs, Including Taxes



GLOBAL INVESTING  
CHART 13

2075

As of 12/31/89

## PANEL DISCUSSION

and Far East Index. So, this is the weighted average of all the countries included in the graph, with an average commission cost of somewhere around 0.5%. It's roughly four or five times as costly on a commission and tax basis as trades in the U.S. This clearly represents a hurdle that must be overcome, but still, as you saw in some of the previous charts, the diversification benefits and expected returns in the international markets have more than compensated for the higher costs.

Now I'd like to discuss the issue of currency hedging and briefly how this is done. When one invests in a foreign market, there are actually two pieces of that investment that are being bundled together.

The first is the non-U.S. asset or the non-U.S. equity that you really want to hold, and then there is the non-U.S. currency that you typically must buy to make that investment. For example, if you're making an investment in a German company, you need to buy deutsche marks to make the investment. Even if there were some way around that, the actual investment in the German stock is denominated in deutsch marks. There are really two embedded investments you're making, one in the underlying equity and the other in the currency, and these two may not in combination be optimal for you. In fact, it may be the case that you would have a more efficient overall investment if you could invest only in the non-U.S. asset or the non-U.S. equity. There is a fairly simple way to achieve this via currency hedging, and what that typically entails is selling currency forwards or futures in an amount that's equal to the currency investment that's embedded in the equity investment that you've made. This is a strategy that has been widely used on the corporate or treasury side of multinational companies for many years and is now becoming more and more applied in the investment context. One of the reasons it's becoming more frequently applied is that as many U.S. investors reach higher allocations to international equities, the issue of whether they want to bear currency risk becomes more important and the benefits or potential benefits from hedging away that currency risk become more manifest.

The most popular technique for hedging this risk is called static currency hedging, and it is again, a quite simple procedure. You simply sell currency forwards or currency futures in an amount that's equal to the currencies that are embedded in the underlying equity investment that you've made. There's a simple way to measure what the benefits would have been behind a static currency hedging approach, at least historically, and this is a risk and return graph similar to the ones that you saw earlier with the annualized return shown along the vertical axis and the risk measured in standard deviation shown along the horizontal axis.

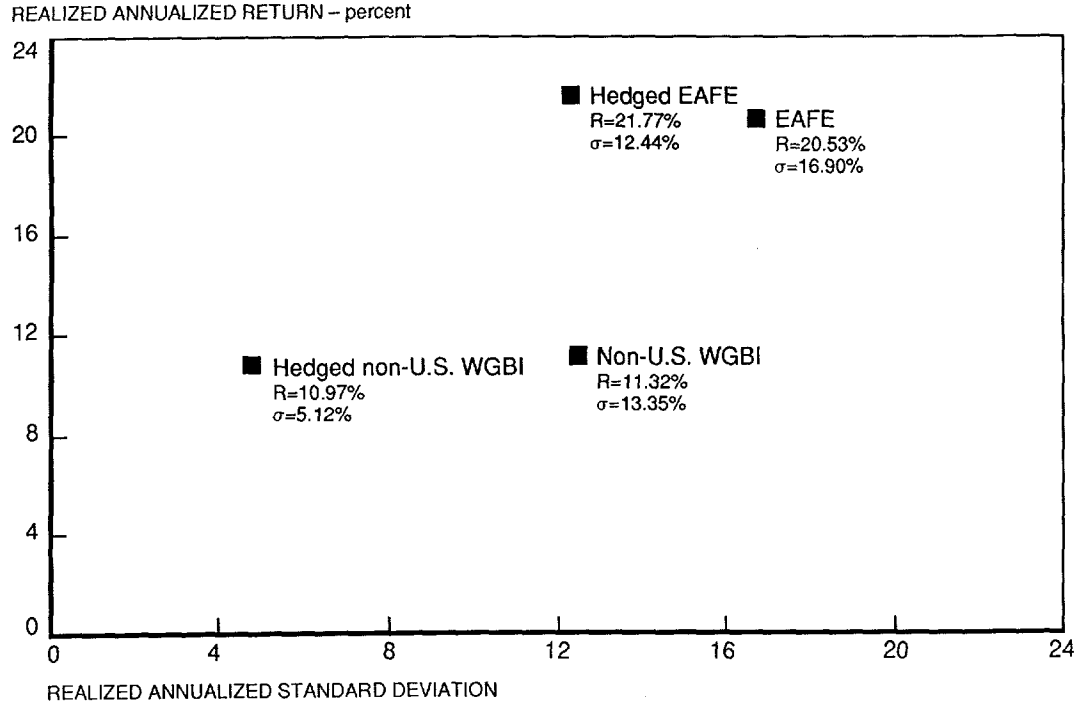
What I've plotted in Chart 14 are the risk and return coordinates for two sets of indices. At the top of the chart are the coordinates for the EAFE, which is the most commonly used index for U.S.-based investors. The risk and return of that index without currency hedging is the point on the upper right. That's the risk and return from investing in that index without currency hedging, or bearing both the underlying equity and currency exposures. To the left are the risk and return coordinates if you had applied static currency hedging, and over this period it turns out that the return has been slightly higher with currency hedging. That's not necessarily something we would expect. In fact, the expectation would be that the returns with and without hedging would be the same,



# EFFECT OF STATIC HEDGING

## Hedged vs. Unhedged Index Comparison

January 1978-December 1989



Currency hedging substantially reduces portfolio risk, without serious effects on portfolio return

## PANEL DISCUSSION

because there's a lot of academic and empirical evidence that strongly suggests that there's no reason for the currency exposure itself to offer an expected return. Currencies should be neutral; it's the equities that offer the expected return. Nevertheless, over this period, it's been the case that hedging has delivered a slightly higher return; but, more importantly, it's been a significant way to reduce risk, and the risk on the portfolio has gone from about 17% down to about 12.5% by currency hedging. The lower set of points shows the results for currency hedging a non-U.S. bond portfolio, using the Salomon Brothers non-U.S. World Government Bond Index as a surrogate. On the bond side, where the currency component of the investment is a much bigger portion of the overall risk, you see a dramatic reduction in risk by currency hedging over this period.

The risk on a non-U.S. government bond portfolio declines from more than 13% to about 5% on an annualized basis by currency hedging.

There is another approach to currency hedging that differs from static currency hedging, and this is generally called dynamic currency hedging. Chart 15 shows the return on a portfolio as a function of the currency return. So, this shows the component of the overall portfolio return that's due to changes in the currency rates or changes in foreign exchange rates. If you had an unhedged portfolio, you would expect a 45 degree line -- that is, as the currencies changed, your portfolio value would change in an equal amount. Static currency hedging is designed to eliminate currencies as a source of risk. So, with a static hedge applied, you would have the straight horizontal line. You would expect there to be no relationship between the return on your overall portfolio and the return on the currencies. Dynamic currency hedging is really a hybrid approach. It is a technique whereby you limit the loss from adverse currency moves, but still preserve some of the participation in positive currency returns. It's really an option-like structure whereby you do profit if the currencies move in your favor, but you limit your losses if the currency should move against you, and that has the kinked payout pattern that's shown by the black line. To use a phrase that's almost been banished from the U.S. financial industry, it's like portfolio insurance -- except it works, fortunately, better for currencies than it did in 1987 for equity portfolios. In fact, it's a technique that currency traders and currency dealing firms routinely use to hedge their exposures. It can be implemented either by trading currency futures, or you can go to a major broker/dealer firm or a bank and just have them sell you a dynamic hedge -- you could buy a currency option that would deliver this kind of a payoff pattern. So, it's just another technique that investors can use to limit the risk from currency exposures that are embedded in an international equity or international bond investment and yet preserve some of the profit potential if the currency should move the right way.

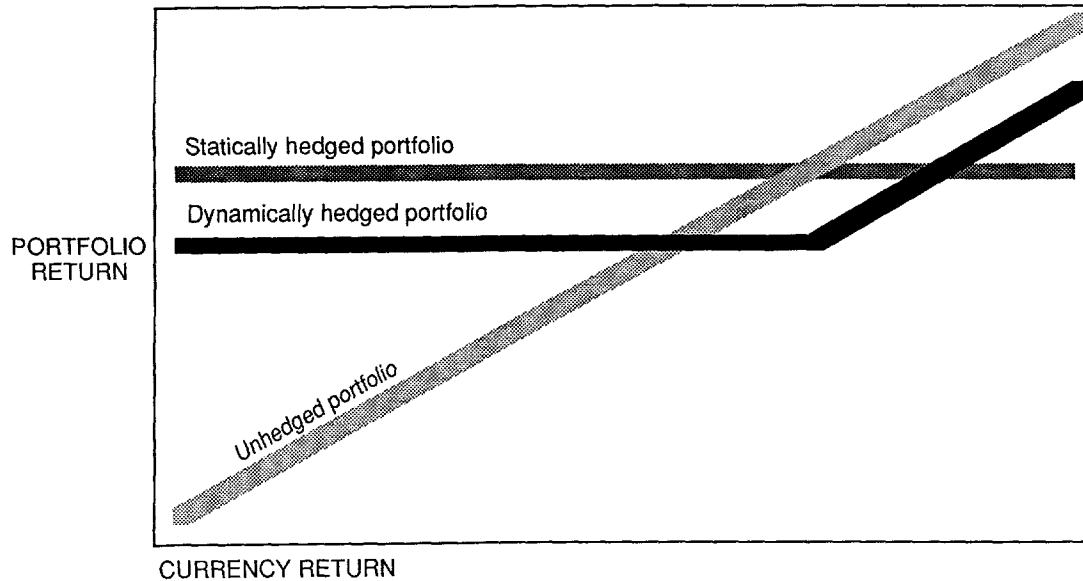
**FROM THE FLOOR:** A brief comment and a question. Some perceive global investing as something only for large funds, but I would remind our group that the global mutual funds, no-load mutual funds, open this to even the smallest investor. Many profit sharing plans and 401(k) plans allow people to select from investment alternatives, and our own firm, like many employers, allows each employee to decide how much to go into an international fund. In the U.S. small capitalization companies have over most, but not all, periods of the past outperformed larger companies. How does that compare with the international market? And what is the outlook for small capitalization stocks in the international market?

## DYNAMIC CURRENCY HEDGING

Protects portfolios from currency losses

Allows participation in currency gains

Has historically outperformed both statically hedged and unhedged currency portfolios



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MR. CREIGHTON: I think Blake has the most direct experience in that. So, Blake, could you comment on that?

MR. GROSSMAN: The history has been that outside the U.S., as has been the case in the U.S., smaller capitalization companies on average have delivered higher returns. So, we've seen the same general sort of small stock effect outside the U.S. that we have in the U.S. Although there's been a fair amount of risk associated with this effect, it is by no means the case that in every year, or even every decade, smaller companies do better. We are seeing more interest in diversifying quite broadly outside the U.S. and picking up more of the medium capitalization than smaller capitalization stocks for exactly that reason. It's been the case that until at least most U.S. investors are comfortable with a core or large stock exposure outside the U.S., they're not comfortable getting into the smaller companies.

MS. ANNA M. RAPPAPORT: We've heard about a lot of discontinuity and change in the world, and I think we're all very aware of it, and I think we see more coming. My question is when working with historical databases or thinking about the future, is there a point of discontinuity where we say we have to throw the old data out because this country isn't the same country anymore or how do we decide that?

MR. CREIGHTON: Blake or Tony, do you have a comment on that?

MR. DARDIS: Well, you need some starting point, and I think the history has got to be your starting point. In order to disregard the history altogether, you're talking about a fundamental structural change in the world economy which I don't think has taken place as yet. But I take your point: You cannot blindly use the history to forecast the future.

MR. CREIGHTON: Blake, do you have anything you'd like to add to that?

MR. GROSSMAN: I think it's a very good point, and certainly with the developments going on in the world today, it would at least be prudent to view reliance on historical results as being somewhat more risky today than it was, let's say, a decade ago, but I really agree with Tony's point. You have to start with something. In fact, after the events in Germany with the Wall coming down, one of our clients wondered, "Gee, are the same kind of currency relationships that you use for managing our strategy, the predicted currency relationships, as likely to hold in the future as they were in the past?" About six months later, after the Wall had come down and there was a lot of upheaval in the European capital markets, we tested the hypothesis that, in fact, everything had changed, and statistically we couldn't accept it. It still seemed that at least from a risk point of view, there was a lot of valuable information in a longer-run history of returns.

MR. TIMOTHY J. LUEDTKE: All of you have primarily talked about equities, and I think that's appropriate for many of our enrolled actuaries here who deal a lot with pension plans because a lot of the pension plans are getting interested in equities. For the insurance companies that have a lot of fixed liabilities, we're primarily interested in fixed instruments, bonds, and such like that. In the U.S. we have a lot of data available to us in terms of looking at bond returns for various quality ratings, a lot of default studies, etc. Are these studies similar to that on the international side? Are there

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information sources for yield pickup for various quality ratings? And can you give me examples of what those information sources might be? And, second, at least as far as the international bond investing is concerned, you can do a lot of investing in governments and a lot of higher-quality issues, at least in the Euro markets. How about in terms of lower-quality issues, say, BAAs? Are there easy access points for that type of investing?

MR. CREIGHTON: Blake, would you like to start off with that one?

MR. GROSSMAN: I'll have to confess I'm an equity guy, so I don't know a great deal about bonds. But in terms of how accessible they are, the only indices that exist, at least to my knowledge, focus solely on government bonds -- the Salomon World Government Bond Index that I included briefly in one graph, and more recently there's a bond index put out by J. P. Morgan that also is exclusively government. So, I have not seen anything that looked at lower-rated issues, or corporate bonds in general, outside the U.S. So, at least from an informational point of view, there would seem to be pretty significant barriers to doing such a study. I think one of the reasons that there hasn't been much work in this area is that there hasn't been much demand from pension investors for international bond exposure, and that's despite some pretty strong evidence that from a diversification standpoint you get a lot of the same benefits you get with international equity investing, particularly if you invest in bonds on a currency hedged basis. They can reduce the risk substantially from what you would have if you invested solely in U.S. bonds. So that's something that will probably require a few more years before there's more of a push from the investment side, which will bring with it the kind of research that we need on the data side in order to provide answers to your questions.

MR. CREIGHTON: Tony, do you have anything you'd like to add to that?

MR. DARDIS: Well, just that as far as European bonds are concerned, the data are very scanty. I think you'll find it difficult to get detailed analysis of yield pickups, yield differences, yield ratios, that sort of thing. The U.K. is probably the best bond market as far as information is concerned, but I think once you go outside the U.K., then you're going to be in a little bit of trouble.

MR. LUEDTKE: Can you recommend any data sources?

MR. DARDIS: In the U.K., Kleinwort Benson has an extensive research department and does some excellent work which concentrates purely on the bond side. So, for European bonds, I think that might be your source.

MR. CREIGHTON: I think if you'd like to talk to Tony about that further, he'd be glad to do that. We can take one more question, and then we'll have to end the formal session.

MR. ROBERT R. REITANO: I was thinking about James Creighton's example on the comparison of buying a long Canadian bond with buying Treasury bond futures and investing the cash in short Canadian bills. I was thinking that to really analyze the excess return you were getting, 300 basis points, if you think of going long on one of those

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positions and short on the other, you realize that you've got two, what I think are, significant slope risks between the two yield curves, that, on the one hand, you're exposed to the Canadian yield curve flattening, and, on the other, you're exposed to the U.S. curve inverting. And I can't help but wonder if the 300 basis points aren't the market's assessment of what that risk is worth today.

MR. CREIGHTON: You're quite right. There is what I would call a dispersion risk in that position, and how much that matters to you depends on what your intent is and why you're putting the position on. Certainly over the last two years the extra reward from that type of position has been much greater than any risk that you were running, but, of course, if you put the position on at the first, you don't know that. You can certainly look back after the fact and say this would have been a great thing to do. It's a kind of position I'd suspect is much more appropriate for a pension fund than an insurance company that's trying to match up liabilities because the pension fund is in a better position to trade off long-term risk and return than the insurance company is. But you're quite right. There is a dispersion risk of a type in that position, and where that comes out is when you get a reshaping of the yield curve.