

The Index Investor

Why Pay More for Less?

Global Asset Class Returns

<i>Year to Date</i>	<u>In USD</u>	<u>In AUD</u>	<u>In CAD</u>	<u>In EURO</u>	<u>In JPY</u>	<u>In GBP</u>
US Equity	12.10%	(7.95%)	(4.58%)	2.43%	12.90%	9.24%
US Bonds	3.90%	(16.15%)	(12.78%)	(5.77%)	4.70%	1.04%
AUS Equity	22.20%	2.15%	5.52%	12.53%	23.00%	19.34%
AUS Bonds	21.21%	1.16%	4.53%	11.54%	22.01%	18.35%
CAN Equity	25.00%	4.95%	8.32%	15.33%	25.80%	22.14%
CAN Bonds	21.14%	1.09%	4.46%	11.47%	21.94%	18.28%
Euroland Equity	12.60%	(7.45%)	(4.08%)	2.93%	13.40%	9.74%
Euroland Bonds	13.67%	(6.38%)	(3.01%)	4.00%	14.47%	10.81%
Japan Equity	4.60%	(15.45%)	(12.08%)	(5.07%)	5.40%	1.74%
Japan Bonds	(0.53%)	(20.58%)	(17.21%)	(10.20%)	0.27%	(3.39%)
UK Equity	8.10%	(11.95%)	(8.58%)	(1.57%)	8.90%	5.24%
UK Bonds	5.53%	(14.52%)	(11.15%)	(4.14%)	6.33%	2.67%
World Equity	11.10%	(8.95%)	(5.58%)	1.43%	11.90%	8.24%
World Bonds	6.40%	(13.65%)	(10.28%)	(3.27%)	7.20%	3.54%
Commodities	9.10%	(10.95%)	(7.58%)	(0.57%)	9.90%	6.24%

Model Portfolio Update

The objective of our first set of model portfolios is to deliver higher returns than their respective benchmarks, while taking on no more risk. The benchmark for the first portfolio in this group is an aggressive mix of 80% domestic equities, and 20% domestic bonds. Through the end of June, this benchmark had returned 4.4%, while our model portfolio had returned 11.8%. We have also compared our model portfolios to a set of global benchmarks. In this

case, the global benchmark is a mix of 80% global equities, and 20% global bonds. Through the end of last month, it had returned 11.0%.

The benchmark for the second portfolio in this group is a mix of 60% domestic equities and 40% domestic bonds. Through the end of last month, it had returned 3.3%, while our model portfolio had returned 10.3%, and the global benchmark had returned 10.0%.

The benchmark for the third portfolio in this group is a conservative mix of 20% domestic equities and 80% domestic bonds. Through the end of last month, it had returned 1.3%, while our model portfolio had returned 7.1% and the global benchmark 8.1%.

The objective of our second set of model portfolios is not to outperform a benchmark index, but rather to deliver a minimum level of compound annual nominal return over a ten-year period. Through last month, our 12% target return portfolio has returned 12.5% year-to-date, our 10% target return portfolio has returned 12.0% our 8% target return portfolio has returned 11.9%, and our 6% target return portfolio has returned 7.1%.

Equity Market Valuation Update

As we have previously noted, our valuation analysis rests on two fundamental assumptions: that over the long term, labor productivity growth in our six major regions will converge to between 2.5% and 3.5% per year, and that the long term real equity risk premium is 4.0% per year. Given those assumptions, here is our updated market valuation analysis at 30 June, 2003:

Country	Real Risk Free Rate	Equity Risk Premium	Required Real Return on Equities	Expected Real Growth Rate*	Div Yield	Expected Real Equity Return**
Australia	2.74%	4.00%	6.74%	4.30%	3.90%	8.20%
Canada	3.01%	4.00%	7.01%	4.10%	2.00%	6.10%
Eurozone	2.02%	4.00%	6.02%	3.50%	3.10%	6.60%
Japan	1.41%	4.00%	5.41%	3.20%	1.10%	4.30%
U.K.	2.03%	4.00%	6.03%	3.50%	3.50%	7.00%
U.S.A.	2.48%	4.00%	6.48%	4.40%	1.70%	6.10%

*This reflects not only 3.5% productivity growth, but also expected labor force growth.

** Expected real growth rate plus current dividend yield

Country	Implied Index Value*	Current Index Value	Current/Implied (productivity growth @3.5%)	Current/Implied (productivity growth at 2.5%)
Australia	390.37	244.23	63%	88%
Canada	172.19	250.53	146%	196%
Eurozone	157.17	127.76	81%	114%
Japan	39.12	78.59	201%	292%
U.K.	371.59	268.61	72%	101%
U.S.A.	325.57	398.35	122%	181%

* Assuming 3.5% future productivity growth

Asset Allocation Review: Part 2

This month we will continue the asset allocation review we used last month, using the same format for each asset class we cover. Next month, we will review the implications of our future return expectations for each asset class for our target return portfolios.

We will begin this month with a revised version of last month's section on foreign currency bonds. Based on questions we received from some of you, this time we will add more detail, to our derivation of expected foreign currency bond returns using the forecast for future

exchange rate changes that is contained in today's government bond yield curves. To be consistent, we will also use the same approach to derive expected returns on foreign equities.

Foreign Currency Bonds

Investment grade foreign currency bonds provide some very attractive diversification benefits to a portfolio. The key difference between this asset class and domestic investment grade bonds is the inclusion of currency risk. In calculating the total return received on a foreign currency bond, it is not just the interest payments received and change in the market price of the bond which matter, but also changes in the exchange rate between the investor's home currency and the currency in which the bond is denominated. The good news is that by holding a portfolio of foreign bonds that are denominated in a range of currencies (not including the home currency), bond funds can, to some extent, reduce this currency risk. Time also helps reduce currency risk, as over long periods exchange rate gains and losses tend to net themselves out, leaving similar real returns across countries (as we saw in our discussion of domestic investment grade bonds in different markets).

The following table shows statistics for foreign bond returns which reinforce these points.

Real Foreign Bond Results, 1971-2002

	Average Annual Return	Standard Deviation	Skewness	Kurtosis	Correl. With Domestic Equity Market	Correl. With Domestic Bond Market
A\$	7.1%	16.7%	(.03)	.56	(.17)	.14
C\$	9.9%	8.7%	.28	.54	(.05)	.35
DM/Euro	6.3%	9.1%	.17	2.21	.36	.21
Yen	5.7%	9.8%	(.37)	1.47	(.01)	.05
GB £	9.2%	9.2%	.47	1.91	.13	.05
US \$	9.5%	11.2%	.51	.72	.09	.19

*Indexes based on IMF Long-Term Government Bond Yield data, with weights based on current relative weights in Salomon Brothers World Government Bond Index.

Generally speaking, across a range of currencies, foreign bonds as an asset class have very attractive statistical properties. Foreign bonds' low correlation of returns with domestic equities and bonds is of particular interest. Research has shown that the correlation of returns between domestic and foreign equity markets tends to vary over time, increasing when they are declining, and decreasing when they are rising. This has caused a number of authors to conclude that the "effective" amount of diversification benefits one receives from investing in foreign equities is lower than it first appears. A key question is whether or not this is also the case with bonds. A recent research paper ("Asymmetric Dynamics in the Correlations of Global Equity and Bond Returns" by Cappiello, Engle, and Sheppart) shows that bonds behave very differently from equities in this regard. They found that the linkages across bond markets were much weaker than the linkages across equity markets, and the lowest correlations in their study were between equity returns in one region (e.g., Asia, North America, and Europe) and bond returns in another. Finally, they noted how the "flight to quality" phenomenon tended to maximize diversification benefits just when they most needed, as equity-bond correlations tend to decrease during periods of financial turmoil.

To check this point, we looked at how foreign currency bonds had performed during the same periods we used for our analysis of investment grade bonds.

Real Foreign Currency Bond Returns Under Different Conditions

Geometric Annual Returns for Decades, Quarterly Returns for Quarters.

	1970s	1980s	1990s	4Q 1987	3Q 1998
A\$	2.0%	10.9%	9.6%	12.8%	12.8%
C\$	4.5%	5.2%	8.5%	13.4%	13.4%
DM/Euro	(2.5%)	7.5%	11.8%	(2.0%)	.01%
Yen	(4.1%)	5.6%	4.7%	4.3%	6.5%
GB £	2.7%	8.6%	8.8%	(0.6%)	5.6%
US \$	4.3%	6.6%	4.0%	23.5%	9.2%

Source: Index Investor calculations

As you can see, foreign currency bonds as an asset class have performed well, across a range of home currencies, time periods, and market conditions. In particular, real returns for this asset class generally display a slightly negative correlation with inflation rates across the full 1971 to 2002 period. The highest correlation across our six currencies is only .13 in Australia.

So, if history is a useful guide the future, we conclude that foreign currency bonds are an attractive asset class. A more difficult challenge is developing an estimate of the future average annual real returns they are likely to deliver, and how volatile these are likely to be.

One approach is to take the historical difference between real foreign currency bond returns and real domestic investment grade bond returns and add that to our estimated future return of 4% for the latter. Over the 1971 to 2002 period, these spreads were as follows:

A\$	C\$	Euro	Yen	GB £	US \$
3.2%	5.6%	1.7%	2.1%	5.1%	5.7%

The average of these six historical differences is 3.9%. If we add this to our estimated future real return on domestic investment grade bonds, we get an expected future real return on foreign currency bonds of 7.9% per year.

A second approach is to assume that current inflation differentials between countries (estimated from their nominal government bond yield curves) will drive future exchange rate changes, and then use these to estimate future foreign bond returns (using the current relative weights of different bond markets in the Salomon Brothers World Government Bond Index). This yields the following expected returns (in local currency) on foreign currency bonds:

A\$	C\$	Euro	Yen	GB £	US \$
1.8%	2.2%	2.4%	7.1%	2.6%	3.2%

The substantial difference between the expected future returns on foreign currency bonds produced by these two methodologies suggests a high degree of uncertainty. Given that, in our optimization analyses we will split the difference between the two methodologies, and use the following estimated real returns for foreign currency bonds:

Estimated Future Real Returns on Foreign Currency Bonds

A\$	C\$	Euro	Yen	GB £	US \$
4.9%	5.1%	5.2%	7.5%	5.3%	5.5%

To be consistent, for standard deviations we will use the actual results for each country for the 1971-2002 period.

Our arguments in favor and against the use of the foreign currency bonds asset class can be summarized as follows:

Market Condition:	Normal	Inflation	Deflation
Reasons to Invest in Foreign Currency Bonds	<ul style="list-style-type: none"> • Low to negative correlations with domestic bond and equity markets • Good protection from adverse event risk 	<ul style="list-style-type: none"> • Real returns have low to negative correlations with inflation across all six currencies. Only comparable asset classes are commodities and real estate 	<ul style="list-style-type: none"> • If real yields are higher in foreign currencies, the latter should appreciate and foreign bond holders benefit.
Reasons Not to Invest in Foreign Currency Bonds	<ul style="list-style-type: none"> • High volatility compared to domestic bonds can offset benefit of low correlation 	<ul style="list-style-type: none"> • If your country has the lowest inflation rate, your currency will appreciate, and foreign currency bond returns will suffer 	<ul style="list-style-type: none"> • If home country real yields are higher than foreign, currency will appreciate, hurting returns on foreign bonds

Domestic and Foreign Property (Real Estate)

Property is the world's largest asset class. Unfortunately, it is also one of the most opaque. Unlike most other asset classes, the assets in question are dissimilar, and trade infrequently at high transaction costs in markets where data collection efforts lag far behind those in markets for more liquid financial assets. Moreover, unlike the markets for financial assets, there are far fewer opportunities for shorting over-priced assets, and supply responds much more slowly to changes in demand, which sets the stage for repeated boom and bust cycles. Given that, we should say up front that we believe the conclusions we will draw in this section, while directionally correct, are less precise than those we draw where better data is available.

At the broadest level, the property asset class can be divided between residential and commercial, and between domestic and foreign assets. Commercial property can be further divided into property that is owned directly versus property that is owned via a vehicle that trades on an established stock exchange (e.g., real estate investment trusts in Canada and the US; listed property companies in Australia, or property mutual funds in Europe).

Residential property is probably the sub-set of this asset class for which returns data are the most sparse. While different indexes have been created in different countries, the only publicly available comparable global index has been created only recently by The Economist newspaper in London. This index shows that between 1995 and 2002, real residential real estate prices increased by a compound annual rate of 6.3% per year in Australia, 0.3% in Canada, 2.5% in the Eurozone, (3.0%) in Japan, 9.5% in the UK, and 3.5% in the United States. The correlation between real residential real estate price changes and inflation in these markets was quite high, at .82 over the seven-year period.

While impressive, these figures almost certainly understate the actual gains experienced by investors in residential real estate. First, they do not include the benefit of the annual rent payments foregone if the owner lives in the property he or she has purchased. Second, they do not reflect the fact that, unlike most asset classes, residential real estate typically is

purchased with a combination of cash and borrowed funds (which, in some markets, can exceed 90% of the purchase price of the asset). Third, they do not reflect the tax benefits (e.g., mortgage interest deductions) that owners of residential real estate receive in many markets. Taking all these factors into account, the actual compound annual returns actually experienced by investors may be two to three times as high as those reported in The Economist's residential property price index. This clearly makes it among the best performing asset classes over the 1995 – 2002 period in most countries. The question is, should we expect this to continue?

In a study published in May, 2003, The Economist concludes that residential property bubbles have developed in Australia, the U.S., the U.K., the Netherlands, Spain and Ireland, and that in these markets at least, residential real estate returns should be lower in the years ahead. As they correctly (in our view) point out, when many first time home buyers find themselves priced out of the market, the negative impact seems certain to be felt by all residential property investors. In addition to this indicator, the authors of this study also base their conclusion on evidence of rises in the property price/property rent and property price/average consumer income ratios to levels that are significantly above the long term averages in these markets. They conclude with a further insightful point: in markets with high percentages of owner occupied housing, the slowdown in returns (or negative returns) is more likely to be reflected in a sharp drop in sales volumes (as people are typically reluctant to sell their home at a loss), while in those markets with higher percentages of investor owned residential properties, volumes may hold up and declining returns more visible.

From a statistical point of view, this confuses matters quite a bit, as returns volatility in the first type of market will appear to be much lower than it is in the second type. We would add a further insight to this: markets in which the majority of homes are purchased using fixed rate mortgages (as in the U.S.) are likely to behave very differently than those in which most property is purchased with floating (i.e., adjustable or variable, depending on your location) rate debt. For example, in the face of a sharp increase in inflation or deflation, the U.S. market (where most mortgages are fixed rate and for 30 year terms) will probably react very differently from the U.K. market (where most mortgages are variable rate). While high

inflation will produce shouts of joy from American homeowners with 6% fixed rate mortgages, the same circumstances would send hordes of British homeowners (with their shorter term variable rate mortgages) rushing to the nearest pub. On the other hand, a sharp bout of deflation would have just the opposite effect (more or less, of course, as there are far fewer pubs in the U.S.).

In sum, when it comes to the percentage of ones total assets that should be allocated to residential real estate, one has to go on instinct more in this asset class than in practically any other. On balance, however, for long term investors who use prudent amounts of debt to finance their purchases, residential real estate still seems like an asset class you want to have in your portfolio (see also "Investing in Real Estate" in our April, 2001 issue).

In comparison with the data available on residential real estate returns, commercial property markets provide a wealth of information. However, in comparison with the information normally available on financial assets, this data is still quite sparse, and of very uneven quality. For example, returns data for directly owned commercial real estate tend to be based on individual appraisers' valuations, which, for very human reasons, tend to change only slowly over time. As a result, price indexes for directly owned real estate show much lower levels of volatility than comparable indexes for commercial property that is owned via exchange traded instruments (such as listed property and real estate investment trusts). In response to this criticism, direct owners of property sometimes note that exchange traded real estate securities probably overstate the volatility of the returns underlying property, as equity market "mood swings" are much more frequent than tenant lease payment renegotiations and building sales.

With those important caveats, the following table shows average annual returns on domestic commercial real estate investment (as measured by a mix of not-perfectly-comparable indexes) between 1988 and 2002 in four major markets, along with the correlations between these returns and those during the same period on domestic bonds, equities, and inflation.

Real Returns on Commercial Property

	Average Annual Return	Standard Deviation	Correlation with Inflation	Correlation with Domestic Bonds	Correlation with Domestic Equities
A\$ 90-01	9.9%	10.5%	(.19)	.73	.69
C\$ 88-02	4.0%	6.9%	(.36)	.29	.64
UK 88-02	6.2%	10.6%	(.46)	(.04)	.23
US 88-02	7.9%	12.0%	(.16)	.18	.41

This table makes a number of interesting points. First, across a range of markets, and with due regard to the limitations of the data we are working with, the widespread popular belief in commercial real estate's effectiveness as a hedge against inflation seems somewhat overstated. The underlying cause is probably the fact that most lease payments take longer to adjust than interest rates do after inflation changes. As a result, real returns would tend to rise when inflation (and interest rates) fall, but fall when inflation and interest rates rise. A recent academic study ("Real Estate Returns and Inflation" by Bonds and Seiler) reached a similar conclusion about commercial property's effectiveness as an inflation hedge after studying data covering 1969 to 1994. The good news, however, was that the authors also concluded that residential real estate provided a much more effective inflation hedge during this period.

Second, on average, the correlation between real estate returns and domestic equity returns is higher than that between real estate and domestic bonds. This may be due to a natural tendency to re-invest some portion of one's equity gains into real estate, and/or to the fact that both equities and real estate deliver good returns in a growing economy, while the latter often leads to interest rate rises that hurt total bond returns.

It is also interesting to compare the average returns and standard deviations in these four commercial property markets to comparable data from their domestic equity markets. On average, over the periods covered, property returns were about 90% of those earned in the equity market, while standard deviations were only 60% as high. On the other hand, while

commercial property earned about the same returns as domestic bonds during this period, those returns were about 50% more volatile. When it comes to estimating future returns on this asset class, these figures are significant. Without seeing any numbers, theory suggests that the relative riskiness of commercial property should lie somewhere between bonds and equities, as it contains elements similar to both. Like a bond, the annual cash flows on a real estate investment (lease payments) are relatively fixed (although, unlike a bond's coupon, they can be adjusted, often with a significant lag, to reflect changes in inflation). Like an equity, however, the actual value of a commercial real estate investment tends to increase as the economy grows, while the capital value of a bond remains fixed (unless it is a real return bond, in which case it changes in line with inflation). Given the uneven quality of the data, and the tendency for short-term returns in different property markets to experience boom and bust cycles, we think that the relative standard deviation number is a better basis for estimating future returns on this asset class in different markets. Given this, we will estimate future returns and standard deviations on commercial real estate as equal to sixty percent of the estimated future returns and standard deviations on domestic equity in each of the markets we are analyzing.

We cannot avoid the fact that this assumption is at odds with the relatively high rates of return that have been earned on listed commercial property securities in recent years, despite weakening conditions in many segments of the underlying property market. We believe that the explanation for this lies in the high dividend yields often paid on these securities. Our thesis is that in a market with few other sources of high current yield (e.g., look at how interest rates have fallen), income-oriented investors have paid insufficient attention to the rising possibility that the market value of many property securities may decline in the future. The following table makes this clear. It shows the average current yields on U.S. based Real Estate Investment Trusts in different market sectors, along with the average change in the price of these securities over the past year.

Recent Property Security Yields and Price Changes in the United States

Segment of REIT Market	Current Dividend Yield	Price Change Over Last Year
Office	7.13%	(1.70%)
Lodging	3.88%	(21.15%)
Residential	7.04%	(2.18%)
Retail	5.96%	22.8%
Industrial	5.82%	10.28%
Self-Storage	5.62%	(0.05%)

The fact of the matter is, commercial real estate has a fairly long and colorful history of “boom and bust” cycles, with the last big downturn having occurred as recently as the early 1990s in many markets around the world. To the most painful example, real estate prices in Japan have fallen by about forty percent in real terms since their peak in 1989. In light of this, assurances that “this time its different” and assertions that commercial real estate is “a very safe investment” tend to ring a bit hollow, and we will stick with our view of its relative risk as lying somewhere between bonds and equities.

Finally, we need to consider whether there are any benefits to diversifying one’s property investments internationally. An examination of the correlation of real commercial property returns between the U.S., U.K, Canada and Australian markets suggests that there is ample opportunity for reducing risk by doing this. The average correlation of returns between these markets is only .36. A recent academic study (“Global Real Estate Markets: Cycles and Fundamentals” by Case, Goetzmann, and Rouwenhorst) also found that international real estate provided useful portfolio diversification benefits, with average cross country return correlations in the range of .33 to .44. The authors found that over the long term, global GDP growth was the most important common driver of returns on property investments across the countries they studied. In the short and medium terms, however, local factors tended to have

a stronger impact, and give rise to significant diversification benefits from investing in both domestic and foreign property.

The following table summarizes our views on the arguments in favor and against investing in the domestic and foreign property asset classes.

Market Condition:	Normal	Inflation	Deflation
Reasons to Invest in Domestic and Foreign Property	<ul style="list-style-type: none"> • In the case of residential property, high returns and emotional benefits • If you seek higher returns than those available on bonds, but don't want to take on as much risk as equity, commercial property is attractive. 	<ul style="list-style-type: none"> • Residential property has proven to be a good hedge against inflation. • Foreign commercial property could benefit from the same exchange rate gains that benefit foreign currency bonds if inflation is highest in your country. 	<ul style="list-style-type: none"> • If real yields are higher in foreign currencies, the latter should appreciate, which will benefit investors in foreign property benefit. • Assuming falls in lease rates lag deflation, domestic commercial property could gain
Reasons Not to Invest in Domestic and Foreign Property	<ul style="list-style-type: none"> • There is a risk of putting too many eggs in residential real estate, and becoming underdiversified as a result. • Commercial property seems to suffer regular boom and bust cycles. 	<ul style="list-style-type: none"> • Historical real returns data show that domestic commercial property is not as good a hedge against inflation as other asset classes. • If your country has the lowest inflation rate, your currency will appreciate, and foreign property returns will suffer 	<ul style="list-style-type: none"> • Residential mortgage debt increase in real value during deflation. • Deflation could force defaults on commercial leases

Commodities

The commodities asset class includes the raw materials used by every economy: energy inputs (e.g., oil, gas), foodstuffs (e.g., coffee, cocoa, sugar, wheat), metals (e.g., aluminum, copper, gold, silver), livestock (e.g., cattle, hogs), and timber. Commodity returns are tracked by a number of different indexes, including the Goldman Sachs Commodities Index (GSCI) and the Dow Jones-AIG Commodities Index. The major difference between these two indexes is the GSCI's relatively higher weighting of energy commodities. They also share a common shortcoming: so far, neither one of them includes timber. Nevertheless, commodities as an asset class, regardless of the index used to track it, have historically provided the best real hedge against inflation risk. On the other hand, when financial markets have encountered liquidity crises (such as the equity market crash of 1987, or the failure of Long Term Capital Management in 1998), commodities have provided less protection than high quality bonds (but relatively better protection than equities).

The following table shows the real local currency rates of return earned by the GSCI during different periods. The first three are geometric returns over the respective decades, while the latter two are quarterly returns.

Real Commodities Returns Under Different Conditions

	1970s	1980s	1990s	4Q 1987	3Q 1998
A\$	8.7%	8.5%	6.4%	(3.8%)	(0.5%)
C\$	13.2%	8.0%	5.6%	(3.3%)	0.1%
DM/Euro	8.0%	6.7%	7.1%	(16.4%)	(11.7%)
Yen	4.9%	5.8%	1.3%	(18.4%)	(6.1%)
GB £	6.2%	7.9%	2.7%	(15.2%)	(6.8%)
US \$	11.8%	7.5%	2.7%	(2.2%)	(4.8%)

It is equally informative to look at the distribution of real returns commodities over the entire 1971 to 2002 period. The following table shows arithmetic average annual returns, standard deviations, skewness and kurtosis for these indexes.

Real Commodities Returns 1971 to 2002

	Arithmetic Average Annual Return	Standard Deviation	Skewness	Kurtosis
A\$	8.7%	21.0%	.93	3.48
C\$	9.4%	18.4%	.58	2.63
DM/Euro	7.9%	21.0%	.41	1.50
Yen	6.4%	21.5%	.26	1.55
GB £	7.1%	15.1%	(.58)	2.29
US \$	8.1%	18.3%	.58	2.76

This table makes several interesting points. First, across all six functional currencies, commodities provided one of the highest real average rates of return of any asset class over the 1971 – 2002 period. However, real returns on commodities were also more volatile (i.e., had a higher standard deviation) than those on many other asset classes. As we have noted previously, this high relative volatility reduced commodities geometric (compound annual) average rate of return over the period. Even on this basis, however, commodities remained among one of the best performing asset classes. Still, investors who are highly sensitive to volatility (e.g., those who are regularly taking money out of their portfolio to finance consumption spending) should limit the weighting they give to this asset class in their portfolios.

Moreover, commodities is a case where the standard deviation of returns overstates the actual risk of holding this asset class in a portfolio. First, annual returns on commodities have low or negative correlations with with returns on most other asset classes. Second, as you can see from the table, in five out six cases, commodity returns are positively, rather than negatively

skewed – for this asset class, positive surprises are more likely than would be the case if returns were normally distributed. Finally, since the kurtosis is high, those positive surprises are likely to be relatively large. Put this all together, and what do you have? An asset class which tends to deliver large positive returns surprises that offset disappointments in other areas. Why does this happen? Because commodities returns tend to go up with inflation. And inflation causes returns on many other assets to go down. All in all, this makes commodities a sensible addition to most portfolios.

But what happens under deflation? If deflation is occurring in all major reasons, commodity prices should decline, and the returns on this asset class will most likely be less than those on investment grade bonds. On the other hand, if deflation is more localized, then commodity prices can still rise. Along with exchange rate effects (as the global price for most commodities is set in U.S. dollars), this can lead to impressive returns on this asset class (as happened in Japan over the past three years).

We do, however, face a serious challenge in estimating expected real average annual returns on this asset class in the future. As we have noted, those returns have a low to negative correlation with returns on other asset classes, so it is very hard to use expected future returns on those other asset classes to derive an estimate for commodities. Finally, as we have seen, real returns on commodities tend to be higher during those decades when inflation is high, and lower when inflation is under control. Given this, we have decided to use the arithmetic average annual real return (and corresponding standard deviations) over the 1971 – 2002 period as our best estimate for the average annual returns investors might reasonably be expected to earn on this asset class in the years ahead.

The following table sums up our views about the pros and cons of this asset class:

Market Condition:	Normal	Inflation	Deflation
Reasons to Invest in Commodities	<ul style="list-style-type: none"> • Low to negative correlation with most other asset classes • Significant positive surprises tend to occur when returns on other asset classes are declining 	<ul style="list-style-type: none"> • Provides one of the best hedges against inflation of any asset class. 	<ul style="list-style-type: none"> • If only one or two regions are experiencing deflation, real returns could still increase, due to a combination of commodity price rises (most global prices are in U.S. dollars) and exchange rate changes.
Reasons Not to Invest in Commodities	<ul style="list-style-type: none"> • Volatility is still high, so volatility averse investors need to limit exposure 	<ul style="list-style-type: none"> • Hard to think of one. 	<ul style="list-style-type: none"> • If many regions are experiencing deflation, commodity prices and real returns should decline

Domestic Equity

When you buy a fixed rate bond issued by a company, the cash flows you will receive in the future (assuming you hold the bond to maturity) are known: you will receive the coupon rate of interest, plus the face value of the bond. As we have seen, only two circumstances could change this. First, you could choose to sell the bond before its maturity. In this case, rather than receiving the face value of the bond, the amount you will receive in general will depend on the relationship between current interest rates and the coupon rate on the bond. If current rates are higher than the coupon, you will receive less than face value, but if they are lower you will receive more. The second source of uncertainty is the chance that the company that issued the bond will experience financial problems, and will default on the payments it owes you.

In contrast to bonds, the payments you expect to receive when you purchase a share of stock are much less certain. In essence, a share of common stock is claim on what is left of a company's cash flows after everyone else who is owed money has been paid (e.g., suppliers, workers, taxes, bondholders, etc.). For example, while you know the current dividend paid on each share of stock when you buy it, there is no that this dividend will remain the same in the future. Depending on the company's business success, the cash available to pay it may increase or decrease. And the company may choose to do something with it other than paying dividends. Alternatively, it could use it to buy back some of its shares (which in some countries is more tax efficient than paying dividends), or it could invest the cash to expand its business.

In addition, the price of the share itself will fluctuate in the future. Broadly speaking, five factors combine to determine the future price of a share you buy today. First, there is the current dividend paid, which is the cash flow you expect to receive in the short term as a result of owning the share. Second, there is the rate at which these dividends are expected to increase in the future. The next two factors determine the rate at which these future cash flows are discounted back to their present value today. The third valuation factor is the current rate of interest on government bonds (also known as the "risk free" rate), and the fourth is the

extra amount of return investors require to induce them to invest in risky equities instead of risk free government bonds. This extra amount is known as the “equity risk premium”. Taken together, these first four factors are often said to determine the “fundamental” or “rational” value of a share of equity.

However, as anyone who experienced the 1990s is well-aware, rational factors aren’t the end of the story when it comes to determining equity prices. Hence our fifth factor: investor emotions. There are times when equity prices, either of a single share or of a market as a whole, rise to levels that are difficult (to put it mildly) to justify based on reasonable estimates of our first four factors. These are the times when momentum tends to be the key factor determining current share prices – in other words, people’s belief that share prices will increase in the future simply because they have done so in the past, without any reference to the changes in the fundamental factors that would justify (or undermine...) those beliefs. Of course, such attempts are sometimes made – who during the tech boom didn’t read an article claiming that future growth rates would be incredible, or that the equity premium was now close to zero? With respect to domestic equities as an asset class, the key point to make is that while these statements may occasionally be true for individual shares (e.g., Microsoft in 1985), they are hardly ever true for an equity market as a whole, and virtually never true at the same time. For example, while rapid real growth in dividends might be expected for an economy emerging from a war, equities would probably still be quite risky under these circumstances. Alternatively, if I knew a big increase in inflation was coming, and could only invest in equities or fixed rate bonds, the real equity risk premium might decline (based on the assumption that equities would do better than bonds under these circumstances). However, there would be no reason to expect the growth of dividend payments to also rapidly increase (as real economic growth tends to fall during periods of high inflation).

The bottom line is this: domestic equities are relatively riskier than many other asset classes, and as such should generally produce higher returns in normal times, and lower returns in difficult times. And, as the following table shows, that is pretty much what has happened since 1971.

Real Domestic Equity Returns Under Different Conditions

Geometric Annual Returns for Decades, Quarterly Returns for Quarters

	1970s	1980s	1990s	4Q 1987	3Q 1998
A\$	(4.6%)	8.6%	8.1%	(38.9%)	(4.3%)
C\$	2.4%	5.5%	7.8%	(19.4%)	(22.3%)
DM/Euro	(1.9%)	11.4%	7.5%	(30.2%)	(21.3%)
Yen	3.4%	18.2%	(7.1%)	(18.7%)	(16.6%)
GB £	(1.4%)	15.4%	9.3%	(27.6%)	(13.1%)
US \$	1.6%	7.7%	13.9%	(31.2%)	(12.4%)

Source: Triumph of the Optimists (Dimson, Marsh, Staunton), and Index Investor calculations

It is equally informative to look at the distribution of real returns on different domestic equity indexes over the entire 1971 to 2002 period. The following table shows arithmetic average annual returns, standard deviations, skewness and kurtosis for these indexes.

Real Domestic Equity Returns 1971 to 2002

	Arithmetic Average Annual Return	Standard Deviation	Skewness	Kurtosis
A\$	5.99%	21.16%	(.84)	2.14
C\$	6.45%	17.65%	(.42)	1.91
DM/Euro	6.53%	16.56%	(.56)	1.95
Yen	5.67%	19.04%	.01	1.00
GB £	7.43%	20.99%	(.88)	3.36
US \$	7.26%	16.29%	(.49)	1.96

This table makes a number of interesting points. First, as was the case with domestic bonds, developed country capital markets seem to have been reasonably efficient over the past thirty years, with average annual real returns on equity in a fairly narrow range across our six

currency regions. The same is true for their volatility (standard deviations), which, apart from commodities, are relatively higher than those for the other asset classes we have so far discussed. It is also the case that across our six regions, real domestic equity returns tend to be moderately correlated with those on domestic bonds, and have low correlations with real returns on commodities. Looking at the last two columns, one can see further evidence that domestic equities are a risky asset class on which one should expect to receive commensurately high returns in normal periods. Skewness is negative (returns below the average are more likely than returns above it), and kurtosis is higher (and relatively extreme returns more frequent) than would be the case in a normal distribution.

Thus far, our comments about domestic equities are relatively uncontroversial, and in line with those by other commentators. The real challenge today, for us and for every other financial writer, is developing a reasonable estimate of the returns domestic equities may provide in the future. Let's take a look at the issues at the heart of the argument.

As we described above, to induce them to hold equities instead of government bonds, rational investors require an additional return premium. One way to summarize this relationship is to say that investors required return on equities (in real terms) equals the current real return on government bonds, plus the current real equity risk premium.

The other side of the question (call it the supply side) is the level of returns equities as asset class will produce in the future. Fundamentally, these returns are a function of two factors: the current dividend yield on equities (i.e., annual dividend/current price) plus the real rate at which dividends are expected to grow in the future. If the future rate of return required by investors is greater than the future rate of return equities are expected to supply, then the current price of equities is too high. As it falls, the dividend yield will increase to the point that the expected future supply of returns equals the rate demanded by investors. And if the rate of return demanded by investors is less than the rate equities are expected to supply, the reverse should happen: prices will rise, and dividend yields decrease, until supply and demand are equal.

Sounds simple, right? But here's the problem: of the four terms in this supply/demand equation, only two are readily available: the current real rate of return on government bonds (we use real return bonds), and the current dividend yield on broad equity market indexes. Both the equity market risk premium demanded by investors and the expected rate of growth for dividends have to be inferred. Disagreement over these two inferences lie at the heart over disagreements about the future rate of return on equities, and whether or not equity market prices will rise or fall.

We have already written about the controversy over the proper value for the equity risk premium (see "Are Equity Markets Overvalued?" in our June, 2002 issue). Broadly speaking it tends to rise and fall over time, decreasing when a string of market gains reduces people's perception of risk, but rising after a string of market losses bring equities' relative riskiness back into focus. On average, we have concluded that four percent is a reasonable long term estimate to use.

The expected future rate of dividend growth is also an area where reasonable people disagree. The most common approach is to use the estimated future growth rate for the economy as a whole as a proxy for the future real growth of corporate profits and dividends. Because the data are so accessible, many writers (ourselves included) typically estimate future economic growth using the rate at which the labor force is growing, times the rate at which labor productivity (output per labor hour worked) is expected to grow. However, this approach has been criticized on three grounds.

First, estimated labor force growth is subject to uncertainty, principally around the average age at which current workers will retire, the rate at which immigration will grow in the future, and the rate at which women will participate in the work force in the future. Current estimates (from the World Bank) for future annual rates of labor force growth in our six currency regions range from a low of minus (0.3%) to a high of .9% for the United States.

Second, the rate of future labor productivity growth is also uncertain. It has varied widely in recent years across countries, as have the relative contributions of its two underlying drivers,

which are known as “capital deepening” (essentially, increasing labor output by giving people more equipment to use) and “multi-factor productivity” (essentially, increasing output by improving the quality of inputs, say through worker training, and/or by changing the way inputs are organized, say by flattening corporate hierarchies). As shown in the following table, these factors are not constant across regions:

Labor Productivity Growth per Year, 1996-1999

	Capital Deepening +	Multifactor Improvement =	Labor Productivity Growth
Australia	1.0%	2.1%	3.1%
Canada	0.7%	0.3%	1.0%
Eurozone*	0.8%	0.7%	1.5%
Japan	1.2%	0.9%	2.1%
UK	0.5%	1.0%	1.5%
US	1.1%	1.5%	2.6%

Source: OECD and BLS

* Average for France, Germany, and Italy

Third, using the overall growth rate for economic output as the growth rate for dividends implies that corporate earnings remain a constant share of GDP, and that dividend payout rates (dividends/earnings) also remain the same over time. However, both of these have been fairly volatile over time. Between 1960 and 2002, corporate earnings averaged 10.7% of GDP in the United States, but with a standard deviation of 1.7%. In recent years they were as high as 12.5% in 1997, and as low as 9.0% in 2001. Over the same period, dividends averaged about 53% of after-tax corporate profits, but with a standard deviation of about 15%.

A look at different real growth rates over time provides a different perspective on the issue. Between 1960 and 2002, real economic growth in the United States arithmetically averaged 3.34% per year. During this same period, annual labor productivity growth averaged 2.24%, implying annual labor force growth of 1.10% per year. At the same time, real after tax corporate earnings in the United States grew by only 2.89% per year on average. Why did real after tax corporate profits grow more slowly than real GDP? Taxes aren't the answer, as real

corporate pre-tax profits grew by only 2.23% per year on average (in other words, corporate tax cuts helped boost profit growth over this period). And don't blame labor – real employee compensation grew by only 3.05% per year. The true culprit was interest payments, which rose by 6.37% per year on average over the 1962 – 2002 period, reflecting both greater use of debt and high real interest rates during some of these years (when the real rate of interest is greater than the real rate of GDP growth, the share of GDP going to interest payments will increase).

On the other hand, real dividend payments grew by 4.38% per year on average over the 1960 – 2002 period. However, dividends can't forever outgrow the after-tax earnings from which they are paid. At the extreme, while an economy might be able to raise its dividend payout ratio above 100% of after-tax earnings for a few years through some combination of increased borrowing and asset sales, this can only continue for a very short time. Over the long term, growth in after-tax corporate earnings is what counts when it comes to generating real dividend increases.

So where does all this data leave us? All in all, this data leads us to conclude that, despite the uncertainties involved, expected GDP growth derived from assumptions about future labor force and productivity growth isn't a bad starting point for estimating the rate at which after-tax corporate earnings will grow in the future. However historical data suggests GDP growth on its own historically has been biased on the high side as an estimator of future earnings growth. Should we adjust it downward in the future? If you assume that the scope for adding additional amounts of leverage to a nation's balance sheet is limited (as it probably is in most major markets today), this question boils down to whether or not you believe that in the future real interest rates will be greater or lesser than the real rate of GDP growth. If you believe they will be greater, then interest payments will absorb an even greater share of future GDP, and corporate earnings growth will (with no change in the share going to labor) be less than GDP growth. On the other hand, if you believe future real interest rates will be less than future GDP growth, then there is no reason (absent any change in labor's share) to adjust GDP growth downward to estimate future corporate earnings growth. So which is it?

At the time this is written, the yields on real return bonds range from a high of 2.92% in Canada to a low of 1.70% in the Eurozone, and even less in Japan (based on subtracting the forecast change in prices from current nominal bond yields). The following table shows current real bond yields, along with forecast economic growth based on two different productivity assumptions: the recent historical average, and an optimistic case of one percent over the historical average.

Future Rates of Return on Domestic Equities: The Growth Factor

	Current Real Bond Yield	Forecast Labor Force Growth	Historical Productivity Growth	Optimistic Productivity Growth	Δ Labor Force + Historic Productivity Growth	Δ Labor Force + Optimistic Productivity Growth
A\$	2.67%	0.8%	3.1%	4.1%	3.9%	4.9%
C\$	2.92%	0.6%	1.0%	2.0%	1.6%	2.6%
DM/Euro	1.79%	0.0%	1.5%	2.5%	1.5%	2.5%
Yen	1.50%	(0.3%)	2.1%	3.1%	1.8%	2.8%
GB £	1.95%	0.0%	1.5%	2.5%	1.5%	2.5%
US \$	2.30%	0.9%	2.6%	3.6%	3.5%	4.5%

From this analysis, it looks like we should downwardly adjust GDP growth to project future corporate earnings growth in Canada, and the less optimistic cases for the Eurozone and UK. The size of this adjustment will be .5% (one half of one percent).

The following table therefore derives our estimates for future returns on the domestic equity asset class in each region by combining the current dividend yield with our low and high estimates for future growth in after-tax corporate earnings. When we use these estimated future returns to develop new model portfolios, we will use the high estimate for future equity returns, and the historical standard deviation over the 1971-2002 period.

Future Estimated Real Annual Rates of Return on Domestic Equities: Summary

	Current Dividend Yield	Low Estimate for Earnings Growth	High Estimate for Earnings Growth	Low Estimate for Future Equity Returns	High Estimate for Future Equity Returns
A\$	3.9%	3.9%	4.9%	7.8%	8.8%
C\$	2.0%	1.1%	2.1%	3.1%	4.1%
DM/Euro	3.1%	1.0%	2.5%	4.1%	5.6%
Yen	1.1%	1.8%	2.8%	2.7%	3.7%
GB £	3.6%	1.0%	2.5%	4.6%	6.1%
US \$	1.7%	3.5%	4.5%	5.2%	6.2%

We can already hear you saying: Wait a minute! These estimates seem low compared to what we've gotten used to. What's going on? In a nutshell, we began the last big bull market with dividend yields much higher than they are today – 5.4% in 1981 in the U.S., or, more recently, 6.6% in Australia in 1990. These yields fell to their current levels as equity market valuations (prices) were driven upward by the powerful combination of falling interest rates and, undoubtedly, a decrease in the equity risk premium people required, and/or an increase in their perception (however inaccurate) of the rate at which earnings would grow in the future.

The essence of the issue is that when dividend yields fall so much it is basically impossible to make up the difference through faster future earnings growth. Mathematically, future returns must be lower. Moreover, if at the same time real bond yields and/or investors' required equity risk premium is moving higher, a situation could easily be created in which the real return on domestic equity that investors demand is higher (perhaps significantly so), than the real rate of return on equities the economy seems likely to supply. This is the set of conditions that could precipitate a sharp decline in equity prices (but which would also increase the dividend yield, and in so doing set the stage for higher future real returns on equity). In sum, the situation is both dynamic and uncertain, which is why we track equity market valuation conditions each month in The Index Investor.

Going forward, in our portfolio modeling we will use the estimated future returns on domestic equity described above, along with the historical standard deviations in each market over the 1971 – 2002 period.

So, to sum up the arguments in favor and against investing in the domestic equity asset class:

Market Condition:	Normal	Inflation	Deflation
Reasons to Invest in Domestic Equity	<ul style="list-style-type: none"> Should deliver high returns in compensation for higher risk born by investors 	<ul style="list-style-type: none"> Since equity is a claim on residual cash flow, and since companies can eventually adjust their prices when faced with inflation, equity returns should suffer less than fixed rate bond returns. 	<ul style="list-style-type: none"> Some companies, e.g., consumer staples providers with strong brands/pricing power and low debt levels, could do very well during deflation. However, the returns for the asset class as a whole will suffer during deflation.
Reasons Not to Invest in Domestic Equity	<ul style="list-style-type: none"> Volatility is relatively high, so volatility-sensitive investors should limit their exposure. In many markets, current valuation levels and dividend yields imply relatively low future returns compared to recent experience 	<ul style="list-style-type: none"> Other asset classes (e.g., real return bonds, commodities, and residential property) provide better protection against inflation 	<ul style="list-style-type: none"> Other asset classes – such as investment grade bonds – provide better protection against deflation.

International Equity

As was true in the case of bonds, investors can invest not only in their domestic equity markets, but also in the equity markets of other countries. Broadly speaking, these international equity markets can be divided into two asset classes: equity markets in developed countries, and emerging equity markets in less developed countries. We will first look at cross-border investment in other developed country equity markets, and then at emerging markets.

As shown in the following table, foreign equity markets produced similar returns to domestic equity markets during key sub-periods over the past thirty plus years:

Real Foreign Equity Returns Under Different Conditions
Geometric Annual Returns for Decades, Quarterly Returns for Quarters

	1970s	1980s	1990s	4Q 1987	3Q 1998
A\$	(1.2%)	11.0%	16.1%	(17.2%)	(8.3%)
C\$	2.9%	7.85	14.4%	(16.8%)	(7.7%)
DM/Euro	(2.1%)	8.6%	12.5%	(27.4%)	(17.4%)
Yen	(5.4%)	7.4%	13.8%	(35.2%)	(13.1%)
GB £	(3.7%)	10.1%	13.9%	(27.0%)	(14.2%)
US \$	5.0%	13.3%	7.4%	(10.9%)	(14.8%)

Source: Index Investor calculations. For A\$ and C\$, based on MSCI World Index; for Eurozone, MSCI World ex-Europe; for Yen, MSCI World ex-Japan; for UK, MSCI World ex-UK; for US, MSCI Europe, Asia, and Far East (EAFE)

Across all six functional currency regions, the effect on returns of two key factors is clear. First, the substantial returns earned in Japan during the 1980s, and second, the substantial returns earned on U.S. dollar investments (due to both a rising equity market and appreciating currency) during the 1990s (which cushioned the dramatic fall in Japanese equity values).

However, these factors also make clear two key points about investing in foreign equity markets.

Over the full 1971-2002 period, historical real arithmetic average annual returns, standard deviation, skewness and kurtosis were as follows:

Real Foreign Equity Returns 1971 to 2002

	Arithmetic Average Annual Return*	Standard Deviation	Skewness	Kurtosis	Correlation with Domestic Equity Returns
A\$	9.71%	12.50%	.31	(0.17)	.51
C\$	7.36%	14.12%	(.33)	1.20	.68
DM/Euro	5.54%	17.64%	(.41)	.71	.68
Yen	4.84%	17.63%	(.48)	1.62	.34
GB £	5.23%	16.32%	(.55)	1.24	.55
US \$	7.04%	17.22%	(.15)	.70	.61

*For A\$ and C\$, Foreign Equity is MSCI World Index; for Euro, World ex-Europe; for Yen, World ex-Japan Index; for GB £, World ex-UK Index; for US, EAFE

In terms of performance, you can see that the returns on foreign equity have been roughly in line with the returns on domestic equity, except in Australia (where foreign equity returns were 3.7% above domestic equity returns between 1971 and 2002) and the UK (where foreign equity returns were 2.2% below domestic returns). On the other hand, foreign equity returns have been less volatile in every region but the Eurozone and US, where foreign volatility was only .9% higher than domestic. Moreover, the distributions of foreign equity returns across our six currency regions have generally had slightly more attractive skewness and kurtosis characteristics than domestic equity (i.e., less of a negative tilt, and not-as-fat tails, which means fewer large downside surprises). Finally, across all six regions, the correlation of foreign equity returns with domestic equity returns has been attractive.

However, as we noted in the section on foreign bonds, these volatility and correlation figures for foreign equity are not constant over time. Unlike the case with foreign bonds, both the volatility and the correlation between domestic and foreign equity returns tend to increase following a negative economic shock. This means that at least some of the apparent diversification (risk reduction) benefit from investing in foreign equities is, practically, a statistical illusion, as it tends to disappear when it is needed most.

On the other hand, risk reduction isn't the only argument in favor of investing in foreign equities. There is also the matter of expanding your access to attractive investment opportunities by looking beyond your home region. This argument is particularly strong when the equity market in your home region is small relative to the total capitalization of developed country equity markets (e.g., Australia, Canada, and to a lesser extent the UK). In other words, not only may you be able to reduce your risk (somewhat) by investing in foreign equities, but you may also be able to increase your expected rate of return.

Of course, this raises the interesting issue of what future rate of return an investor should expect on foreign equities in developed markets. We have looked at this question from two different perspectives. The first takes as its starting point the expected future real returns we estimated in the domestic equity section of this article, and then adjusts them using each region's current relative weight in the FTSE World Index. This approach assumes that, over the long term, exchange rate (XR) changes will basically cancel each other out. The second approach does not make this assumption, but rather adds a third factor: the expected changes in future exchange rates implicit in the differences between current nominal rates on each region's government bonds.

These different approaches yield the following estimates of future differences between the real returns on domestic versus foreign equities:

Potential Future Annual Real Returns on Foreign Developed Market Equity

	Low Estimate, No XR Impact	High Estimate, No XR Impact	Low Estimate with XR Impact	High Estimate with XR Impact
A\$	4.70%	5.83%	3.00%	4.20%
C\$	4.81%	5.94%	3.60%	4.80%
DM/Euro	4.87%	5.94%	4.50%	5.50%
Yen	4.96%	6.09%	7.90%	9.10%
GB £	4.78%	5.86%	4.00%	5.10%
US \$	4.08%	5.40%	3.90%	5.20%

Based on the theory that we should use all the information available to us when developing our expected returns, in our model portfolio development we will use the "High Estimate, With XR Impact" assumption for future returns on foreign equity, and the historical standard deviation of returns and correlations for the 1971-2002 period. However, we should stress that, as in the case of all of our other estimates of future returns, this one is also highly uncertain.

So, to sum up the arguments in favor and against investing in the foreign developed market equity asset class:

Market Condition:	Normal	Inflation	Deflation
Reasons to Invest in Foreign Equity	<ul style="list-style-type: none"> • Should deliver high returns in compensation for higher risk born by investors • May deliver higher returns due to exposure to a wider range of opportunities • Should deliver some risk reduction benefits 	<ul style="list-style-type: none"> • Since equity is a claim on residual cash flow, and since companies can eventually adjust their prices when faced with inflation, equity returns should suffer less than fixed rate bond returns • Foreign equity may benefit from changes in exchange rates driven by inflation differentials 	<ul style="list-style-type: none"> • Some companies, e.g., consumer staples providers with strong brands/pricing power and low debt levels, could do very well during deflation. However, the returns for the asset class as a whole will suffer during deflation. • If deflation is higher at home than abroad, foreign equity returns could benefit
Reasons Not to Invest in Foreign Equity	<ul style="list-style-type: none"> • Volatility is relatively high, so volatility-sensitive investors should limit their exposure. • In many markets, current valuation levels and dividend yields imply relatively low future returns compared to recent experience • Some of the diversification benefits from foreign equity often prove to be illusory during market downturns 	<ul style="list-style-type: none"> • Other asset classes (e.g., real return bonds, commodities, and residential property) provide better protection against inflation 	<ul style="list-style-type: none"> • Other asset classes – such as investment grade bonds – provide better protection against deflation.

Emerging Markets Equity

As an asset class, emerging markets equities offers the potential for higher returns than foreign (developed market) equities, though at the price of higher risk. The higher return potential is driven by rates of both labor force and productivity growth that are higher (sometimes considerably so) than comparable rates in more developed countries. On the other hand, emerging markets also tend to have (and these are broad generalizations), less stable political systems and economies than developed markets. Consequently, the returns on emerging markets equity investments are more volatile than those on developed markets equities.

The following table quantifies these points. Unlike other tables in this article, it is based on a shorter data series, as high quality information on emerging markets equity returns only became available in 1988.

Emerging Markets Equities, 1988-2002

	Arithmetic Average Annual Real Return	Standard Deviation	Skewness	Kurtosis	Correlation with Foreign Equity Returns	Correlation with Domestic Equity Returns	Spread Over Domestic Equity Return
A\$	13.7%	25.3%	(.05)	1.76	.41	.63	6.6%
C\$	11.5%	22.8%	(.52)	1.33	.57	.53	4.2%
DM/Euro	12.4%	27.7%	(.38)	.64	.73	.64	5.9%
Yen	12.6%	26.6%	(.39)	.84	.71	.38	15.0%
GB £	10.8%	27.0%	(.38)	1.11	.73	.56	4.9%
US \$	9.6%	24.0%	(.58)	1.53	.55	.62	0.6%

As you can see, emerging markets equities have produced quite impressive returns over the past fifteen years, as these countries received substantial inflows of capital and gradually opened their doors to foreign portfolio investors (i.e., individuals and institutions wishing to buy shares or bonds issued by companies located in these markets). Unfortunately, this period also saw a number of debt, inflation, and foreign exchange crises in these markets, which gave rise to the relatively high levels of volatility experienced by foreign investors.

An interesting question is the extent to which these historical returns will be repeated in the future. To examine that question, we looked at the current dividend yields and forecast rates of GDP growth (from the IMF) for fifteen of the largest (by market capitalization) emerging equity markets. The following table shows the estimated future equity returns for these markets:

Estimated Future Real Annual Returns in Emerging Equity Markets

	Dividend Yield June, 2003	99-04 Growth (IMF Estimate)	Estimated Future Equity Return
Brazil	4.80%	2.71%	7.51%
Mexico	1.90%	2.61%	4.51%
Chile	1.80%	3.41%	5.21%
China	3.20%	7.66%	10.86%
India	2.50%	5.10%	7.60%
Indonesia	3.90%	3.90%	7.80%
S.Korea	1.80%	5.72%	7.52%
Malaysia	2.50%	4.71%	7.21%
Taiwan	1.80%	2.78%	4.58%
Thailand	2.80%	4.03%	6.83%
S.Africa	4.30%	3.06%	7.36%
Israel	1.70%	1.59%	3.29%
Russia	2.00%	5.14%	7.14%
Poland	2.60%	2.59%	5.19%
Hungary	1.50%	3.96%	5.46%

The weighted average expected future equity return for all fifteen countries is 6.33%. This is higher than the future estimated return for most developed country markets, but certainly not by that much. And it is well below the real rates of return emerging markets equities have delivered in the past. As we have seen before, the underlying culprit is low starting dividend

yields in many countries, which reflects the result of the inflows of foreign capital (and upward pressure on their equity prices) that many of these countries have experienced in recent years.

If the relative riskiness of these countries has not also declined, then the argument for investing in them as a single asset class has also weakened. Is there any basis for believing that the relative riskiness of investing in emerging markets has also fallen? On the global level, there is an argument that the world has become more, not less risky, with rising probabilities for periods of both deflation and inflation. Moreover, growth in many of these emerging markets is heavily dependent on exports to developed markets -- if the latter suffer, so do the former. Finally, the political institutions in many of these emerging markets are still underdeveloped relative to those in developed market countries. When growth slows in these economies, governments are less able to resist popular pressure for measures that may reduce the returns earned by foreign investors (e.g., inflationary spending, exchange controls, debt defaults, etc.).

On the other hand, the experience gained through managing the many crises that occurred during the past thirty years has probably made the system better able to weather the ones we will confront in the future. On balance, however, we think that these factors are at best offsetting, and that the overall riskiness of investing in emerging markets equities hasn't decreased. Given this, going forward emerging markets equities as an asset class (given their current expected future returns) seem less attractive today than they have in the past. Within the asset class, however, there are still some regions (notably Asia), where expected risk-adjusted returns seem high enough to justify some investment.

Finally, in terms of exchange rate effects, many, but not all of the emerging markets countries have linked their currencies to the U.S. dollar. In the case of other asset classes, we have used the expected exchange rate changes implicit in today's government bond rates to adjust expected real returns. However, we have decided not to do this in the case of emerging markets equities, because the future existence of these "dollar pegs" seem highly uncertain, given our current economic outlook.

Given this, in our model portfolio analysis, we will use 7.50% (approximately the average expected return for emerging Asian markets) as our future return assumption for emerging markets equities, along with the historical standard deviations from the 1971-2002 period.

So, to sum up the arguments in favor and against investing in the emerging market equity asset class:

Market Condition:	Normal	Inflation	Deflation
Reasons to Invest in Emerging Market Equity	<ul style="list-style-type: none"> • May deliver higher returns due to exposure to a wider range of opportunities • Should deliver some risk reduction benefits 	<ul style="list-style-type: none"> • Since equity is a claim on residual cash flow, and since companies can eventually adjust their prices when faced with inflation, equity returns should suffer less than fixed rate bond returns 	<ul style="list-style-type: none"> • Some companies, e.g., consumer staples providers with strong brands/pricing power and low debt levels, could do very well during deflation. However, the returns for the asset class as a whole will suffer during deflation.
Reasons Not to Invest in Foreign Equity	<ul style="list-style-type: none"> • Future returns may not be as high as historical returns, while volatility remains at close to its historical level. In short, the risk/return trade-off for the asset class as a whole may have worsened (though this may not be true for some subregions, such as developing Asian countries). 	<ul style="list-style-type: none"> • Other asset classes (e.g., real return bonds, commodities, and residential property) provide better protection against inflation 	<ul style="list-style-type: none"> • Other asset classes – such as investment grade bonds – provide better protection against deflation.

Private Equity

As the name implies, this asset class encompasses investments in the equity of companies that are not publicly traded. These investments are usually made through a professionally managed fund, which serves as the intermediary for searching out, evaluating, and monitoring the private equity investments. In general, there are two sub-classes of private equity: venture capital funds and buyout funds. The former tend to make a large number of small investments (relative to the size of the fund) in a large number of companies that are in the early stages of development, and with prospects for high future growth. In contrast, buyout funds typically leverage investors' money with debt, and make a small number of large investments. The classical buyout situation is a fund, in combination with an existing management team, purchasing ("taking private") a division or subsidiary of a public company.

Both venture capital funds and buyout funds generate returns for their investors by selling the companies in which they have invested for more money than they paid for them. These sales generally take one of two forms: an initial public offering of the company's shares to the public (an "IPO"), or the sale of the company to another company (a "trade sale"). Beyond this, however, the underlying economics of venture capital and buyout funds are quite different. Venture capital funds expect to lose money on most of their investments, and to earn their returns on just a few "big winners" whose rapid growth (or expected growth) entices buyers to pay high prices for their shares. In contrast, buyout funds expect to make money on all their investments. They try to do this by increasing the free cash flow (cash flow after capital investment) of the companies they purchase. Most often, this is accomplished through cost cutting and asset sales, rather than by stimulating faster sales growth.

Historically, a major problem in evaluating the relative attractiveness of this asset class has been the lack of available and reliable data on its risk and returns. The essence of the problem is that the actual return earned on an investment in a private equity fund isn't known with certainty until the fund is liquidated (usually after ten years). Before then, estimated returns are based on the valuation of the fund's investments (often by its own managers), which is at

best a very uncertain science. Fortunately, one of the most recent studies in this area ("The Cash Flow, Return, and Risk Characteristics of Private Equity, by Ljungquist and Richardson) has overcome many of these limitations. Its results are based on the actual cash flow data for a large sample of private equity funds that were raised and liquidated between 1981 and 2001. The study contains a number of very interesting findings:

- The funds' investments were not well diversified. On average, they invested close to forty percent of their capital in a single industry.
- The average private equity fund generated annual returns above those on the domestic equity market (net of fees paid to the fund's managers) of between five and eight percent.
- Returns on the sample of funds had significant negative skewness, with many funds underperforming the domestic equity benchmark, while a few delivered returns well above it. In short, manager selection is a critical component of successful investing in this asset class.
- The returns earned on most funds did not turn positive until the very end of a fund's life (most were liquidated, and their profits returned to investors, after ten years).
- In essence, the private equity returns earned above those on domestic equity reflected compensation for holding an illiquid investment for ten years, as well as the risk associated with picking a poor investment manager.
- In general, the more money that was raised by private equity funds in any given year (known as the "vintage year" of the fund), the lower the returns earned by private equity funds started that year.

Because they are not available to public market investors, we are not including private equity in our model portfolios. Nevertheless, because some of our readers have the opportunity to invest in this asset class, we have included it in this commentary. Looking forward, our

expected return estimate for this asset class is domestic equities plus 5%, with a standard deviation of domestic equities plus 5%.

So, to sum up the arguments in favor and against investing in the private equity asset class:

Market Condition:	Normal	Inflation	Deflation
Reasons to Invest in Private Equity	<ul style="list-style-type: none"> Should deliver higher returns in compensation for holding liquidity risk 	<ul style="list-style-type: none"> Since all equity is a claim on residual cash flow, and since companies can eventually adjust their prices when faced with inflation, equity returns should suffer less than fixed rate bond returns 	<ul style="list-style-type: none"> Some companies, e.g., consumer staples providers with strong brands/pricing power and low debt levels, could do very well during deflation. However, the returns for the asset class as a whole will suffer during deflation.
Reasons Not to Invest in Private Equity	<ul style="list-style-type: none"> Liquidity is very low, so investors who need to make regular withdrawals from their portfolio should avoid private equity. Avoid investing in years when large amounts of new funds are being raised, as this tends to depress future returns 	<ul style="list-style-type: none"> Other asset classes (e.g., real return bonds, commodities, and residential property) provide better protection against inflation 	<ul style="list-style-type: none"> Other asset classes – such as investment grade bonds – provide better protection against deflation.

Absolute Return (Hedge Fund) Strategies

As defined by the U.S. Presidential Working Group on Financial Markets a hedge fund is “any pooled investment vehicle that is privately organized, administered by professional investment managers, and not widely available to the public.” However, this latter statement is becoming less and less true; for example, publicly listed funds which employ hedge fund-type strategies are already available to investors in Australia and Hong Kong, and funds based on various hedge fund indexes have been discussed in the United States.

Hedge funds are also known as "absolute value" strategies because their managers are frequently judged by whether or not they achieve a certain level of returns within specified risk limits rather than by their performance against a benchmark index. Strictly speaking, hedge funds are not an asset class in themselves, as we define the meaning of that term. Rather, they are better thought of as a collection of different asset classes whose returns generally have low correlations with each other.

We have written about hedge funds before, and refer you to our March, 2001 and April, 2002 issues for a broader discussion of them. This article will provide only a brief summary of their pros and cons as asset classes.

Broadly speaking, absolute value strategies can be divided into three groups. The first seeks to earn high risk-adjusted returns through various forms of arbitrage -- taking large, offsetting long and short positions in securities that are, respectively, under and overpriced. Most arbitrage strategies employ significant amounts of leverage (through the use of debt and/or derivative contracts, such as options, futures, and swaps) to magnify the gains from spotting and exploiting these valuation discrepancies. The key risks faced by arbitrage focused hedge funds are liquidity crises that overwhelm arbitrage relationships (such as the Russian debt crisis that sunk Long Term Capital Management in 1998), and the ever-increasing information technology arms race in the financial services industry (which makes arbitrage opportunities easier to spot and exploit, and hence forces the use of more leverage to earn targeted returns).

A second group of hedge funds pursue what are known as "event-based" strategies, which aim to profit from unique events such as mergers and bankruptcies. The risks faced by these funds include economic conditions that reduce investment opportunities and/or invalidate the experience (on the part of the investment manager) on which they are based. A good example of the latter might be a prolonged period of deflation, which few managers outside Japan have ever experienced. A further risk to event-driven strategies is the increasing number of funds that are pursuing them. This tends to quickly drive up prices for special situation securities, and reduce the returns from successful transactions.

A third group of hedge funds pursues "directional strategies". The main difference between these hedge funds and a publicly traded mutual fund is that the former can (a) take short positions as well as long ones; (b) in a wider variety of instruments; and (c) use leverage (debt and/or derivatives) to magnify gains (and losses, we should add). Directional funds include both "long/short" and "dedicated short bias" equity funds, as well as "global macro funds" which essentially take active long and short positions in different asset classes around the world (think of it as an actively traded overlay on top of your basic long term strategic asset allocation policy). The main risks faced by directional strategy funds include taking wrong directional bets, and, less obviously, not being adequately compensated for taking "fat tail" or extreme event risks (e.g., when writing deep out of the money put options, to use a very simple example of this).

As in the case of private equity, any assessment of the relative attractiveness of absolute value strategies is severely hampered by the quality of the publicly available data. Three key problems have been identified. The first is selection bias: only successful hedge fund managers tend to report their results to companies that compile hedge fund performance indexes. The second is survivorship bias: in the past, hedge fund indexes have dropped results for funds that ceased operations. Both self-selection and survivorship bias tend to overstate the returns earned by hedge funds. The third problem has been called "stale price reporting." To the extent that hedge fund managers are basing their self-reported results on out-of-date prices for some of the investments they own (as might be the case if those

investments are very thinly traded), the correlation of their reported returns with those on other asset classes may be understated.

In our analysis, we have used the CSFB/Tremont Hedge Fund Indexes, which attempt to correct for the last two of these biases. Still, our conclusions should be regarded as more uncertain than those for other asset classes, which are based on better sample data.

As examples of the three different absolute value approaches, we will use the CSFB/Tremont indexes for Market Neutral Equity Funds (an arbitrage strategy), Event-Driven Funds, and Long/Short Equity and Global Macro Funds (both directional strategies). The following table shows a variety of data for the U.S. market (where eighty percent of hedge funds are based):

Hedge Fund Performance in U.S. Dollars, 1994-2002

	Equity Market Neutral	Event-Driven	Long/Short Equity	Global Macro
Arithmetic Average Annual Real Return	8.78%	8.48%	10.29%	12.49%
Standard Deviation	5.76%	10.32%	17.56%	14.53%
Correlation with Wilshire 5000 (domestic equity)	.43	.54	.76	.33
Skewness	.21	(3.01)	.26	.07
Kurtosis	.10	20.84	2.68	1.36
Average Annual Return vs. Domestic Equity	1.38%	1.08%	2.89%	5.09%
Standard Deviation vs. Domestic Equity	(10.65%)	(6.09%)	1.15%	(1.88%)

This table tells a very interesting story about investing in absolute value strategies. First, Long/Short equity is not, statistically, very much different from investing in a broad public

equity market index like the Wilshire 5000. Over the 1994-2002 period, it delivered more return while taking on more volatility. However, the skewness of these returns was positive .26, while for the Wilshire 5000 it was negative (.64). And given the size of the kurtosis for the Long/Short strategy (2.68) it was more likely to deliver large positive surprises than the equity market as a whole. That being said, the correlation of returns is sufficiently high (at .76) that it is probably best to regard Long/Short as another possible tilt within the overall domestic equity asset class (e.g., similar to value stocks, or small cap stocks).

The same cannot be said for the remaining three strategies, which are sufficiently different, both from the public equity market and from each other, to be considered independent asset classes. In this regard, it is interesting to compare the Equity Market Neutral and Event Driven strategies, which delivered approximately equal real returns over the 1994 to 2002 period, and had roughly similar correlations with the Wilshire 5000. Beyond that, these are two very different animals. To put it simply, the Event Driven strategy took on much more risk to achieve the same level of return as the Equity Market Neutral strategy.

The Event Driven strategy had almost twice the volatility as the Equity Market Neutral approach, and vastly different skewness and kurtosis figures. While the latter was as close to a normal distribution as any asset class we've seen, the Event Driven Strategy is much more a "feast or famine" approach, with the latter being, statistically, more likely than the former. Given this data, we would not recommend including an Event Driven strategy in one's portfolio, while an Equity Market Neutral strategy would seem to make sense.

We also wanted to see how attractive the Equity Market Neutral strategy was to investors whose functional currency was not the U.S. dollar. The following table shows the results of this analysis.

Equity Market Neutral Strategy Results, 1994-2002

	Arithmetic Average Annual Real Return	Standard Deviation	Correlation with Domestic Equity
A\$	10.9%	11.8%	0.65
C\$	10.9%	4.9%	0.28
DM/Euro	10.0%	13.6%	0.68
Yen	9.6%	13.3%	(0.54)
GB £	8.7%	7.7%	0.30

As you can see, Equity Market Neutral has been an attractive asset class for investors in all out currency regions.

Finally, let's look at Global Macro. As regular readers know, here at The Index Investor we basically believe you should decide on the asset allocation strategy that will achieve your goals at the lowest possible risk, implement it through low cost index funds, and rebalance once per year to your target weights to control your risk. However, we have been asked many times about our views on market timing. Our response has been twofold. In general, we don't believe that, as a regular practice, it makes sense for most investors, because it is expensive to implement (due to the trading and tax costs it generates), and most investors cannot regularly generate sufficient insight to incur these costs and come out ahead. However, that being said, experience has taught us that there are exceptions to this rule, when misvaluations become so apparent that they justify some active short term deviations from one's normal long term allocations to different asset classes. The devaluation of the British Pound in the early 1990s and the over valuation of the U.S. equity market in 2000 are examples we like to cite. In short, we are not ideologues on the issue of market timing.

When we look at the results for the Global Macro strategy, we are tempted to add a third point to our reply on market timing: were a Global Macro index fund to ever become available (at an acceptable cost, of course), it might make a good addition to a portfolio, in that it would

effectively delegate the responsibility for implementing market timing decisions to investment managers who specialize in just this type of activity on a global basis.

To see how broadly this conclusion might apply, we analyzed the real returns the Global Macro strategy generated in other currencies. The results are shown in the following table:

Global Macro Strategy Results, 1994-2002

	Arithmetic Average Annual Real Return	Standard Deviation	Correlation with Domestic Equity	Correlation with Domestic Bonds
A\$	14.6%	16.3%	0.51	.77
C\$	14.6%	13.1%	.06	.66
DM/Euro	13.7%	17.7%	0.44	(.16)
Yen	13.3%	21.0%	(0.56)	.48
GB £	12.4%	14.1%	0.31	.36

In all cases, this analysis shows that the Global Macro strategy generated attractive real returns over the 1994-2002 period. The correlation data is also interesting, as it provides some retrospective insight as to the strategy that Global Macro funds may have been following to generate those returns (e.g., going short Japanese equities and long Australian and Canadian bonds).

In sum, we believe that a good case can be made, where the right investment vehicle is available, for including Equity Market Neutral and Global Macro strategies as separate asset classes in a well diversified portfolio. As a rough estimate of the future returns these two approaches might generate, we suggest using an estimate of domestic equity plus 1.25% for the Equity Market Neutral strategy (with a standard deviation of domestic equity less 8%), and domestic market equity plus 3% for the Global Macro strategy (with a standard deviation of domestic equity less 1%). These are lower than the reported historical returns for two reasons. First, we are trying to adjust for the influence of survivorship and selection bias on reported returns. Second, we are trying to take into account the likely impact of increased

competition on the future risk and returns both of these strategies will deliver. Finally, given that publicly traded hedge fund vehicles are not generally available today, we will not include absolute value strategies in our model portfolio optimization analysis. When and if these vehicles do become widely available (preferably in the form of index instruments), we will update our model portfolios.

The following table summarizes our views on the pros and cons of Equity Market Neutral and Global Macro hedge funds:

Market Condition:	Normal	Inflation	Deflation
Reasons to Invest in Absolute Value (Hedge Fund) Strategies	<ul style="list-style-type: none"> • Equity Market Neutral seems likely to boost returns while lowering portfolio risk • Global Macro can provide additional returns through tactical asset allocation for a small portion of your portfolio, minimal additional risk 	<ul style="list-style-type: none"> • Since all equity is a claim on residual cash flow, and since companies can eventually adjust their prices when faced with inflation, equity returns should suffer less than fixed rate bond returns • Unsettled environment should favor Global Macro strategy 	<ul style="list-style-type: none"> • Unsettled environment should favor global macro strategy.

Market Condition:	Normal	Inflation	Deflation
Reasons Not to Invest in Absolute Value (Hedge Fund) Strategies	<ul style="list-style-type: none"> Liquidity is low, so not appropriate for investors who make regular withdrawals from portfolio. With large amount of new money flowing into hedge funds, historical risk/return relationships will probably worsen in the future 	<ul style="list-style-type: none"> Other asset classes (e.g., real return bonds, commodities, and residential property) provide better protection against inflation Hedge funds haven't really been tested under these conditions 	<ul style="list-style-type: none"> Other asset classes – such as investment grade bonds – provide better protection against deflation than equity (including equity market neutral funds).

Conclusion

We'll conclude this asset allocation review with the short summary we offered at the beginning of it last month: different asset classes provide different degrees of downside protection and upside potential. Broadly speaking, our "home market" (we think of this as the market in which returns are denominated in the same currency as our liabilities) can be in one of three states: normal, high inflation, or deflation. In the normal state, we don't need as much downside protection as we do in the other states, and look to equity type investments to generate high returns for us (domestic, foreign, and emerging market equity, private equity, and absolute value). In the inflationary state, we look to asset classes like real return bonds and commodities (and possibly foreign bonds and real estate) to protect the purchasing power of our capital. Finally, in the deflationary state, we look to investment grade bonds and foreign currency bonds to preserve our capital while maximizing our real returns.

This review has also provided a quantitative perspective on different asset classes. We have shown the real returns they have delivered in the past, and assessed the different factors (volatility, correlation, skewness and kurtosis) that determine their relative riskiness. We

have also developed forward looking estimates of the real returns these asset classes may deliver in the future. These are summarized in the following table:

Japanese Yen Expected and Historical Asset Class Returns

June, 2003

	Expected Arithmetic Average Annual Real Return	Historical Arithmetic Average Annual Real Return*	Standard Deviation (Volatility) of Returns
Real Return Bonds	N/A	N/A	N/A
Investment Grade Bonds	4.0%	3.6%	5.6%
Foreign Bonds	7.0%	5.7%	9.8%
Commercial Property/Real Estate	2.2%	-5.8%	11.4%
Commodities	6.4%	6.4%	21.5%
Domestic Equity	3.7%	5.7%	19.0%
Foreign Equity	9.1%	4.8%	17.6%
Emerging Markets Equity	7.5%	12.6%	26.6%
Private Equity	8.7%	N/A	24.0%
Equity Market Neutral	5.0%	9.6%	11.0%
Global Macro	6.7%	15.8%	18.0%

*periods are the same as those used in the different asset class sections of this article

**current yield

As we have repeatedly stated, these estimates are uncertain; future returns may turn out to be much different than they were in the past, or than we currently expect them to be in the future. Stated simply, there is no escaping risk when it comes to investing. Nevertheless, we hope our estimates provide you with food for thought. To further this process, next month we will present new model portfolios based on our estimates for future real asset class returns, and compare them to our current model portfolios.

Model Portfolio Performance

<i>These portfolios seek to maximize return while matching their benchmark's risk (standard deviation)</i>					
	Ticker	YTD 30Jun03	Weight	Weighted Return	
		in Yen		In Yen	
High Risk Portfolio					
<i>Suggested US Index Funds</i>					<i>Suggested Japanese Index Funds</i>
<u><i>Japan Benchmark</i></u>					
Japan Equity ETF	EWJ	5.4%	80%	4.3%	iShares Topix; Daiwa Topix Index Trust
Japan Bond Index	JPM JPN	0.3%	20%	0.1%	Nikko Japan Bond Index Trust
			100%	4.4%	
<u><i>Global Benchmark</i></u>					
US Equity Index (DJTMI ETF)	IYY	12.9%	40%	5.2%	Nomura Global Stock Index Trust; Deutsche World Stock Index Trust
Vanguard Total International Market	VGTSX	10.9%	40%	4.4%	Nomura Global Stock Index Trust; Deutsche World Stock Index Trust
Vanguard Total U.S. Bond Market Index	VBMFX	4.7%	10%	0.5%	UFJ Parters Global Bond Index Trust
TRP International (Non US\$) Bond Fund	RPIBX	9.7%	10%	1.0%	UFJ Parters Global Bond Index Trust
			100%	11.0%	
<u><i>Recommended</i></u>					
US Equity Index (DJTMI ETF)	IYY	12.9%	50%	6.4%	Morgan Stanley S&P 500 Index Trust
Vanguard Europe	VEURX	11.8%	23%	2.7%	Morgan Stanley Europe Index Trust
Japan Bond Index	JPM JPN	0.3%	7%	0.0%	Nikko Japan Bond Index Trust
Vanguard Emerging Markets	VEIEX	16.4%	10%	1.6%	UFJ Partners Worldwide Emerging Trust
Oppenheimer Real Asset Fund	QRABX	9.9%	10%	1.0%	Nikko Power and Energy Trust
			100%	11.8%	

<i>These portfolios seek to maximize return while matching their benchmark's risk (standard deviation)</i>					
	Ticker	YTD 30Jun03	Weight	Weighted Return	
		in Yen		In Yen	
Medium Risk Portfolio					
<i>Suggested US Index Funds</i>					<i>Suggested Japanese Index Funds</i>
<i>Japan Benchmark</i>					
Japan Equity ETF	EWJ	5.4%	60%	3.2%	iShares Topix; Daiwa Topix Index Trust
Japan Bond Index	JPM JPN	0.3%	40%	0.1%	Nikko Japan Bond Index Trust
			100%	3.3%	
<i>Global Benchmark</i>					
US Equity Index (DJTMI ETF)	IYY	12.9%	30%	3.9%	Nomura Global Stock Index Trust; Deutsche World Stock Index Trust
Vanguard Total International Market	VGTSX	10.9%	30%	3.3%	Nomura Global Stock Index Trust; Deutsche World Stock Index Trust
Vanguard Total U.S. Bond Market Index	VBMFX	4.7%	20%	0.9%	UFJ Partners Global Bond Index Trust
TRP International (Non US\$) Bond Fund	RPIBX	9.7%	20%	1.9%	UFJ Partners Global Bond Index Trust
			100%	10.0%	
<i>Recommended</i>					
US Equity Index (DJTMI ETF)	IYY	12.9%	50%	6.4%	Morgan Stanley S&P 500 Index Trust
Vanguard Europe	VEURX	11.8%	17%	2.0%	Morgan Stanley Europe Index Trust
Vanguard Emerging Markets	VEIEX	16.4%	5%	0.8%	UFJ Partners Worldwide Emerging Trust
Japan Bond Index	JPM JPN	0.3%	18%	0.0%	Nikko Japan Bond Index Trust
Oppenheimer Real Asset Fund	QRABX	9.9%	10%	1.0%	Nikko Power and Energy Trust
			100%	10.3%	

<i>These portfolios seek to maximize return while matching their benchmark's risk (standard deviation)</i>					
	Ticker	YTD 30Jun03	Weight	Weighted Return	
		in Yen		In Yen	
Low Risk Portfolio					
<i>Suggested US Index Funds</i>					<i>Suggested Japanese Index Funds</i>
<u>Japan Benchmark</u>					
Japan Equity ETF	EWJ	5.4%	20%	1.1%	iShares Topix; Daiwa Topix Index Trust
Japan Bond Index	JPM JPN	0.3%	80%	0.2%	Nikko Japan Bond Index Trust
			100%	1.3%	
<u>Global Benchmark</u>					
US Equity Index (DJTMI ETF)	IYY	12.9%	10%	1.3%	Nomura Global Stock Index Trust; Deutsche World Stock Index Trust
Vanguard Total International Market	VGTSX	10.9%	10%	1.1%	Nomura Global Stock Index Trust; Deutsche World Stock Index Trust
Vanguard Total U.S. Bond Market Index	VBMFX	4.7%	40%	1.9%	UFJ Parters Global Bond Index Trust
TRP International (Non US\$) Bond Fund	RPIBX	9.7%	40%	3.9%	UFJ Parters Global Bond Index Trust
			100%	8.1%	
<u>Recommended</u>					
US Equity Index (DJTMI ETF)	IYY	12.9%	24%	3.1%	Morgan Stanley S&P 500 Index Trust
Vanguard Europe	VEURX	11.8%	14%	1.7%	Morgan Stanley Europe Index Trust
Japan Bond Index	JPM JPN	0.3%	34%	0.1%	Nikko Japan Bond Index Trust
Global Bond Index	Custom	7.2%	18%	1.3%	UFJ Parters Global Bond Index Trust
Oppenheimer Real Asset Fund	QRABX	9.9%	10%	1.0%	Nikko Power and Energy Trust
			100%	7.1%	
<i>Global Bond Index = 50% US\$ plus 50% Non-US\$ Bonds</i>					

<i>These portfolios seek to maximize the probability of achieving at least the target return over ten years, at the lowest possible risk.</i>					
	Ticker	YTD 30Jun03	Weight	Weighted Return	
		in Yen		in Yen	
<i>Suggested US Index Funds</i>					<i>Suggested Japanese Index Funds</i>
12% Target Return					
<i>Recommended</i>					
US Equity Index (DJTMI ETF)	IYY	12.9%	41%	5.3%	Morgan Stanley S&P 500 Index Trust
Vanguard Europe	VEURX	11.8%	39%	4.6%	Morgan Stanley Europe Index Trust
Vanguard Emerging Markets	VEIEX	16.4%	10%	1.6%	UFJ Partners Worldwide Emerging Trust
Oppenheimer Real Asset Fund	QRABX	9.9%	10%	1.0%	Nikko Power and Energy Trust
			100%	12.5%	
10% Target Return					
<i>Recommended</i>					
US Equity Index (DJTMI ETF)	IYY	12.9%	40%	5.2%	Morgan Stanley S&P 500 Index Trust
Vanguard Europe	VEURX	11.8%	28%	3.3%	Morgan Stanley Europe Index Trust
Vanguard Emerging Markets	VEIEX	16.4%	10%	1.6%	UFJ Partners Worldwide Emerging Trust
Oppenheimer Real Asset Fund	QRABX	9.9%	10%	1.0%	Nikko Power and Energy Trust
Global Bond Index	Custom	7.2%	12%	0.9%	UFJ Parters Global Bond Index Trust
			100%	12.0%	

<i>These portfolios seek to maximize the probability of achieving at least the target return over ten years, at the lowest possible risk.</i>					
	Ticker	YTD 30Jun03	Weight	Weighted Return	
		in Yen		in Yen	
<i><u>Suggested US Index Funds</u></i>					<i><u>Suggested Japanese Index Funds</u></i>
8% Target Return					
<i><u>Recommended</u></i>					
US Equity Index (DJTMI ETF)	IYY	12.9%	40%	5.2%	Morgan Stanley S&P 500 Index Trust
Vanguard Europe	VEURX	11.8%	33%	3.9%	Morgan Stanley Europe Index Trust
Pacific Ex Japan ETF	EPP	17.1%	2%	0.3%	Prudential Pacific Equity Fund
Vanguard Emerging Markets	VEIEX	16.4%	8%	1.3%	UFJ Partners Worldwide Emerging Trust
Oppenheimer Real Asset Fund	QRABX	9.9%	10%	1.0%	Nikko Power and Energy Trust
Japan Bond Index	JPM JPN	0.3%	4%	0.0%	Nikko Japan Bond Index Trust
Global Bond Index	Custom	7.2%	3%	0.2%	UFJ Parters Global Bond Index Trust
			100%	11.9%	
6% Target Return					
<i><u>Recommended</u></i>					
Japan Equity ETF	EWJ	5.4%	3%	0.2%	iShares Topix; Daiwa Topix Index Trust
US Equity Index (DJTMI ETF)	IYY	12.9%	31%	4.0%	Morgan Stanley S&P 500 Index Trust
Vanguard Europe	VEURX	11.8%	11%	1.3%	Morgan Stanley Europe Index Trust
Vanguard Emerging Markets	VEIEX	16.4%	9%	1.5%	UFJ Partners Worldwide Emerging Trust
Japan Bond Index	JPM JPN	0.3%	46%	0.1%	Nikko Japan Bond Index Trust
			100%	7.1%	
<i>Global Bond Index = 50% US\$ plus 50% Non-US\$ Bonds</i>					