

The Index Investor

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This Month's Issue: Key Points

Our first article this month examines fundamental and dividend index weighting. Before investing in funds based on these approaches, investors need to ask what caused them to outperform market capitalization based index products, and whether these causes will continue to exist in the future. We conclude that, like the small capitalization anomaly, the fundamental and dividend weighting anomalies should disappear, or at least shrink in size over time. However, at least in the short term, these new products may well outperform. Our next article reviews new commodity indexes and investable products launched last month. We still prefer the Dow Jones AIG index. On the product front, we like the new ETF launched in Germany that tracks the Rogers International Commodities Index (it's an improvement on the existing product that tracks the GSCI). Assuming the IRS agrees with Barclays view about their tax

treatment, we also very much like the new iPath Exchange Traded Notes launched in the U.S. whose return tracks the DJAIG index.

Our next feature looks at current bond yield spreads and asks what they may be telling us. We conclude that they compensate investors not just for default risk (which itself can only be assessed with uncertainty), but also liquidity risk and the risk that the financial system will switch regimes, from the current low volatility/high return one into the more turbulent high volatility/low return alternative. We also conclude that bond spreads are low relative to history and in light of current conditions, suggesting overvaluation exists.

Our third feature article looks at the recent jump in the VIX volatility index, and what it may imply for conditions that lie ahead. After reviewing the historical performance of other asset classes after previous jumps in the VIX, we conclude that a well-diversified portfolio should be able to weather whatever storms lie ahead. Our next article updates our economic outlook and warning indicators. We present excerpts from last month's annual report of the Bank for International Settlements (the central banks' bank). It largely mirrors our view that while the global economic and financial system has proven remarkably resilient, the pressures continue to build and could easily trigger a sharp downturn. We present a scenario of how this could unwind across different asset classes, and the key indicators investors should monitor.

This month, we also analyze the impact of rebalancing decisions on the probability that an investor will achieve his or her long-term goals. We conclude that rebalancing when at least one asset class is ten percent or more above or below its long-term target weight makes the most sense. This month's product and strategy notes look at a new study that shows how badly investor were hurt by chasing performance over the past twenty years; how 401(k) plan administrators aren't good active fund pickers; whether or not there will be a residential property crash (the OECD says maybe, Harvard says not likely in the U.S.); why investing in illiquid assets is "the poor man's alpha", and the challenges faced by someone who tries to use Rydex new currency ETFs to create their own foreign index.

This Month's Letters to the Editor

What did you think of the recent comments by Bill Miller from Legg Mason that were critical of investing in commodities today?

Looking back over what we have written recently, I'd say we are broadly in agreement with it. Many of our model portfolios include a policy (e.g., long-term, or baseline) allocation to commodities. This is based on our assumptions about commodities' long-term correlation with returns on other asset classes, their expected returns, and their forecast standard deviations of returns. Our return assumption is based on a weighted (50/50) mix of historical results and the outputs from our forward looking asset pricing model. That model has a very conservative view of commodities returns, and includes only the so-called "diversification" return (the return earned by investing in a diversified basket of commodity futures contracts), which we consider to be the most reliable over time. We estimate this return to be 4% above the return on real return bonds.

However, in our writing we constantly emphasize two important points. First, any investor contemplating a reallocation into (i.e., an increase in exposure to) a given asset class must make a judgment about whether it is currently seriously overvalued. In our view, financial markets function as complex adaptive systems in which such overvaluations can occur. Second, any investor already invested in a given asset class must, as a prudent risk manager, also be cognizant of valuation trends, and be willing to tactically reduce his or her exposure to asset classes that appear to have become seriously overvalued.

We have noted in our writing this year that commodities, and in particular those index products with a heavy weighting on energy and metals (such as the GSCI), appeared to be overvalued. However, we have also noted that this conclusion is itself dependent on one's underlying view of future economic conditions, and the time frame in which one expects them to develop. For example, if one expects a sharp slowdown in the global economy, then it is quite easy to make the case that commodities today are overvalued. So if someone were not yet invested in them, or was thinking of adding to their position, now would certainly seem an inopportune time to add to one's commodities exposure.

On the other hand, if one also believes that a global downturn is likely to trigger a round of deflation, which will be followed by a sharp reflation led by the world's central banks (who,

after watching Japan's experience over the past decade, must surely fear deflation more than inflation), then if one already had a position in commodities there would be a question about whether or not to reduce it in light of current conditions. If inflation returns with a vengeance, commodities will once again be an attractive asset class to hold. So the investor who is already long commodities has to weight the transaction costs (and possibly tax costs) of selling now only to buy in again later against the potential benefits of this approach (avoiding having to watch commodities fall in value before they rise again). On balance, we have noted that this is a personal decision that depends on an investor's preferences. However, we have also noted that investors who are overweight commodities (i.e., whose portfolios contain commodities at a higher weight than their policy target) should rebalance back down to their target weight or slightly below it (if commodities are their most overweight asset class). As we have noted, on a five-year time frame, we are far more concerned about exposure to equities than we are commodities.

I was wondering what your position was on leveraged index products? I've had a number of clients mention that they pay particular attention to your website, and as I am not a subscriber, was curious on your stance.

First, let me distinguish between two approaches to the use of leverage. In one case, you are using it tactically, to increase your potential return from a superior forecast about the future returns on one or more asset classes. In essence, you are using it to boost your active return (alpha). In the second case, you are incorporating leverage into your strategic asset allocation policy. This approach has been the subject of much discussion lately. On one side, for example, is Ray Dalio and Bridgewater Associates, with their arguments that a portfolio's expected performance can be improved by leveraging different asset classes to have the same expected rate of return, and then combining them to minimize volatility. Bridgewater argues that this can produce superior asset allocation solutions for some investors. On the other side is Barclays Global Investors (see their recent article "Leverage and the Limits of the Possible"). They argue that, assuming one's expected asset class returns are derived from those asset classes' current weights in the global market portfolio (i.e., the one composed of all asset classes weighted by their total capitalization), there is no benefit from adding leverage to

specific asset classes. As they point out, under these conditions, the entire efficient frontier can be replicated through a combination of the market portfolio and borrowing or lending. On the other hand, they do admit that, in so far as one's assumptions for different asset classes differ from those implicit in the market portfolio's asset class weights, the use of leverage can add value.

In our view, both arguments are right, because they make fundamentally different assumptions. Bridgewater assumes an investor doesn't necessarily want to hold the market portfolio. This could be due to that investor having a different position (e.g., as a small business owner she may be averse to holding the same percentage of equity as the market portfolio), having different preferences (e.g., more sensitivity to inflation risk), or having a different forecast for future returns than the one implicit in the market portfolio. To these arguments we would add that there are plenty of arguments as to why the global market portfolio is both difficult to measure accurately (e.g., what are the right weights for commodities, timber, or property?) and not always priced efficiently. Moreover, the technique of "backing out" expected asset class returns from asset class weights in the global market portfolio itself depends on the use of fixed covariance assumptions that, in practice, we know are not stable over time (i.e., correlations tend to rise in market downturns and volatility clusters in high and low regimes).

Given these arguments, we have been building a multiperiod asset allocation model that incorporates the possible use (on a policy basis) of leverage. While we are not finished yet, one thing we have noted is that, if you explicitly model two different regimes — one with low correlations and low asset class volatility, and one with the opposite conditions (call it the "turbulent" regime), the use of leverage is challenging. And when you add in liquidity risk factors (i.e., the tendency of disappearing liquidity to widen bid/ask spreads at the very time that falling asset prices are causing leveraged portfolios to reduce their exposure), you get an even more "interesting" problem. At this point, we are leaning toward requiring that any portfolio using policy leverage also include exposure to equity market volatility as an asset class, as that seems to be an excellent way to reduce the additional risks the use of leverage brings.

Global Asset Class Returns

<i>YTD 30Jun06</i>	<i>In USD</i>	<i>In AUD</i>	<i>In CAD</i>	<i>In EURO</i>	<i>In JPY</i>	<i>In GBP</i>	<i>In CHF</i>	<i>In INR</i>
Asset Held								
US Bonds	-0.90%	-2.21%	-5.46%	-8.90%	-4.07%	-8.40%	-8.03%	1.35%
US Prop.	13.20%	11.89%	8.64%	5.20%	10.03%	5.70%	6.07%	15.45%
US Equity	3.30%	1.99%	-1.26%	-4.70%	0.13%	-4.20%	-3.83%	5.55%
AUS Bonds	-4.13%	-5.44%	-8.69%	-12.13%	-7.30%	-11.63%	-11.26%	-1.88%
AUS Prop.	8.18%	6.87%	3.62%	0.18%	5.00%	0.68%	1.05%	10.43%
AUS Equity	10.31%	9.00%	5.76%	2.32%	7.14%	2.82%	3.19%	12.57%
CAN Bonds	3.04%	1.73%	-1.52%	-4.96%	-0.13%	-4.46%	-4.09%	5.29%
CAN Prop.	8.27%	6.97%	3.72%	0.28%	5.10%	0.78%	1.15%	10.53%
CAN Equity	8.45%	7.14%	3.89%	0.45%	5.27%	0.95%	1.32%	10.70%
Euro Bonds	5.73%	4.42%	1.17%	-2.27%	2.56%	-1.77%	-1.40%	7.98%
Euro Prop.	22.50%	21.19%	17.94%	14.50%	19.33%	15.00%	15.37%	24.75%
Euro Equity	13.41%	12.10%	8.85%	5.41%	10.23%	5.91%	6.28%	15.66%
Japan Bonds	1.42%	0.11%	-3.14%	-6.58%	-1.75%	-6.08%	-5.71%	3.67%
Japan Prop.	3.03%	1.72%	-1.53%	-4.97%	-0.14%	-4.47%	-4.10%	5.28%
Japan Equity	0.89%	-0.42%	-3.67%	-7.11%	-2.28%	-6.61%	-6.24%	3.14%
UK Bonds	5.73%	4.42%	1.17%	-2.27%	2.56%	-1.77%	-1.40%	7.98%
UK Prop.	20.96%	19.65%	16.40%	12.96%	17.79%	13.46%	13.83%	23.21%
UK Equity	13.29%	11.98%	8.74%	5.30%	10.12%	5.80%	6.17%	15.55%
World Bonds	1.35%	0.04%	-3.21%	-6.65%	-1.82%	-6.15%	-5.78%	3.60%
World Prop.	12.44%	11.13%	7.88%	4.44%	9.27%	4.94%	5.31%	14.69%
World Equity	6.40%	5.09%	1.84%	-1.60%	3.23%	-1.10%	-0.73%	8.65%
Commodities	-0.80%	-2.11%	-5.36%	-8.80%	-3.97%	-8.30%	-7.93%	1.45%
Timber	-0.27%	-1.58%	-4.83%	-8.27%	-3.44%	-7.76%	-7.39%	1.98%
EqMktNeutral	4.29%	2.98%	-0.27%	-3.71%	1.11%	-3.21%	-2.84%	6.54%
Volatility	8.37%	7.06%	3.81%	0.37%	5.20%	0.87%	1.24%	10.62%
Currency								
AUD	1.31%	0.00%	-3.25%	-6.69%	-1.86%	-6.19%	-5.82%	3.56%
CAD	4.56%	3.25%	0.00%	-3.44%	1.39%	-2.94%	-2.57%	6.81%
EUR	8.00%	6.69%	3.44%	0.00%	4.83%	0.50%	0.87%	10.25%
JPY	3.17%	1.86%	-1.39%	-4.83%	0.00%	-4.32%	-3.95%	5.42%
GBP	7.50%	6.19%	2.94%	-0.50%	4.32%	0.00%	0.37%	9.75%
USD	0.00%	-1.31%	-4.56%	-8.00%	-3.17%	-7.50%	-7.13%	2.25%
CHF	7.13%	5.82%	2.57%	-0.87%	3.95%	-0.37%	0.00%	9.38%
INR	-2.25%	-3.56%	-6.81%	-10.25%	-5.42%	-9.75%	-9.38%	0.00%

Asset Class Valuation Update

Our market valuation analyses are based on the assumption that markets are not perfectly efficient and always in equilibrium. This means that it is possible for the supply of future returns a market is expected to provide to be higher or lower than the returns investors logically demand. In the case of an equity market, we define the future supply of returns to be equal to the current dividend yield plus the rate at which dividends are expected to grow in the future. We define the return investors demand as the current yield on real return government bonds plus an equity market risk premium. As described in our May, 2005 issue, people can and do disagree about the “right” values for these variables. Recognizing this, we present four valuation scenarios for an equity market, based on different values for three key variables. First, we use both the current dividend yield and the dividend yield adjusted upward by .50% to reflect share repurchases. Second, we define future dividend growth to be equal to the long-term rate of total (multifactor) productivity growth, which is equal to either 1% or 2%. Third, we use two different values for the equity risk premium required by investors: 2.5% and 4.0%. Different combinations of these variables yield high and low scenarios for both the future returns the market is expected to supply, and the future returns investors will demand. We then use the dividend discount model to combine these scenarios, to produce four different views of whether an equity market is over, under, or fairly valued today. The specific formula is $(\text{Current Dividend Yield} \times 100) \times (1 + \text{Forecast Productivity Growth})$ divided by $(\text{Current Yield on Real Return Bonds} + \text{Equity Risk Premium} - \text{Forecast Productivity Growth})$. Our valuation estimates are shown in the following tables, where a value greater than 100% implies overvaluation, and less than 100% implies undervaluation:

<i>Australia</i>	Low Demanded Return	High Demanded Return
High Supplied Return	70%	105%
Low Supplied Return	107%	148%

<i>Canada</i>	Low Demanded Return	High Demanded Return
High Supplied Return	101%	164%
Low Supplied Return	184%	266%

<i>Eurozone</i>	Low Demanded Return	High Demanded Return
High Supplied Return	70%	112%
Low Supplied Return	116%	166%

<i>Japan</i>	Low Demanded Return	High Demanded Return
High Supplied Return	97%	193%
Low Supplied Return	242%	386%

<i>United Kingdom</i>	Low Demanded Return	High Demanded Return
High Supplied Return	52%	91%
Low Supplied Return	91%	136%

<i>United States</i>	Low Demanded Return	High Demanded Return
High Supplied Return	126%	188%
Low Supplied Return	215%	295%

<i>Switzerland</i>	Low Demanded Return	High Demanded Return
High Supplied Return	94%	158%
Low Supplied Return	176%	253%

<i>India</i>	Low Demanded Return	High Demanded Return
High Supplied Return	126%	206%
Low Supplied Return	249%	361%

Our government bond market valuation update is based on the same supply and demand methodology we use for our equity market valuation update. In this case, the supply of future fixed income returns is equal to the current nominal yield on ten-year government bonds. The demand for future returns is equal to the current real bond yield plus the historical average inflation premium (the difference between nominal and real bond yields) between 1989 and 2003. To estimate of the degree of over or undervaluation for a bond market, we use the rate of return supplied and the rate of return demanded to calculate the present values of a ten year zero coupon government bond, and then compare them. If the rate supplied is higher than the rate demanded, the market will appear to be undervalued. This information is contained in the following table:

	Current Real Rate	Average Inflation Premium (89-03)	Required Nominal Return	Nominal Return Supplied (10 year Govt)	Return Gap	Asset Class Over or (Under) Valuation, based on 10 year zero
Australia	2.50%	2.96%	5.46%	5.80%	0.34%	-3.17%
Canada	1.89%	2.40%	4.29%	4.59%	0.31%	-2.88%
Eurozone	1.95%	2.37%	4.32%	4.06%	-0.26%	2.52%
Japan	1.02%	0.77%	1.79%	1.93%	0.14%	-1.37%
UK	1.51%	3.17%	4.68%	4.70%	0.02%	-0.21%
USA	2.52%	2.93%	5.45%	5.15%	-0.30%	2.86%
Switz.	1.73%	2.03%	3.76%	2.83%	-0.93%	9.42%
India	2.85%	7.57%	10.42%	7.85%	-2.57%	26.55%

*Derived from ten year yield and forecast inflation

It is important to note some important limitations of this analysis. First, it uses the current yield on real return government bonds (or, in the cases of Switzerland and India, the implied real yield if those bonds existed). Over the past forty years or so, this has averaged around 3.00%. Were we to use this rate, the required rate of return would generally increase. Theoretically, the “natural” or equilibrium real rate of interest is a function of three variables:

(1) the expected rate of multifactor productivity growth (as it increases, so to should the demand for investment, which will tend to raise the real rate); (2) risk aversion (as investors become more risk averse they save more, which should reduce the real rate of interest, all else being equal); and (3) the time discount rate, or the rate at which investors are willing to trade off consumption today against consumption in the future. A higher discount rate reflects a greater desire to consume today rather than waiting (as consumption today becomes relatively more important, savings decline, which should cause the real rate to increase). These variables are not unrelated; a negative correlation (of about .3) has been found between risk aversion and the time discount rate. This means that as people become more risk averse, they also tend to be more concerned about the future (i.e., as risk aversion rises, the time discount rate falls).

All three of these variables can only be estimated with uncertainty. For example, a time discount rate of 2.0% and risk aversion factor of 4 are considered to be average, but studies show that there is wide variation within the population and across the studies themselves. The analysis in the following table starts with current real return bond yields and the OECD's estimates of multifactor productivity growth between 1995 and 2002 (with France and Germany proxying for the Eurozone). We then try to back out estimates for risk aversion and the time discount rate that would bring theoretical rates into line with those that have been observed in the market. The real rate formula is $[(\text{Time Discount Rate} + (1/\text{Risk Aversion Factor}) \times \text{MFP Growth})]$.

Real Rate	AUD	CAD	EUR	JPY	GBP	USD
Risk Aversion Factor	4.0	5.0	5.0	6.0	5.0	4.0
Time Discount Rate	2.00%	1.50%	1.50%	1.00%	1.50%	2.00%
MFP Growth	1.60%	1.20%	1.40%	0.60%	1.40%	1.40%
Estimated Real Rate	2.40%	1.74%	1.78%	1.10%	1.78%	2.35%
Actual Real Rate	2.50%	1.90%	1.90%	1.00%	1.50%	2.50%

Our analysis also uses historical inflation as an estimate of expected future inflation. This may not produce an accurate valuation estimate, if the historical average level of inflation is not a good predictor of average future inflation levels. For example, if expected future inflation is lower than historical inflation, required returns will be lower. Also, if one were to assume a very different scenario, involving a prolonged recession, accompanied by deflation, then one could argue that government bond markets are actually undervalued today.

Let us now turn to the subject of the valuation of non-government bonds. Some have suggested that it is useful to decompose the bond yield spread into two parts. The first is the difference between the yield on AAA rated bonds and the yield on the ten year Treasury bond. Because default risk on AAA rated companies is very low, this spread may primarily reflect prevailing liquidity and jump (regime shift) risk conditions. The second is the difference between BBB and AAA rated bonds, which may tell us more about the level of compensation required by investors for bearing default risk. For example, between August and October, 1998 (around the time of the Russian debt default and Long Term Capital Management crises), the AAA-Treasury spread jumped from 1.18% to 1.84%, while the BBB-AAA spread increased by much less, from .62% to .81%.

The following table shows the average level of these spreads between January, 1970 and December, 2005 (based on monthly Federal Reserve data), along with their standard deviations and 67% (average plus or minus one standard deviation) and 95% (average plus or minus two standard deviations) confidence range.

	AAA – 10 Year Treasury	BBB-AAA
Average	.97%	1.08%
Standard Deviation	.47%	.42%
Avg. +/- 1 SD	1.44% - .50%	1.51% - .66%
Avg. +/- 2 SD	1.91% - .03%	1.93% - .23%

At 30 June, 2006 the AAA minus 10 year Treasury spread was .76%., down from .83% at the end of May. This was below the long-term average compensation for bearing liquidity and jump risk (assuming our model is correct). This seems especially odd given the rise in the VIX during June. The BBB minus AAA spread was .91%, up slightly from .83% at the end of May. Again, this was below the long-term average compensation for bearing default risk. In sum, the current spreads lead us to conclude that it is more likely that corporate bonds today are overvalued than undervalued.

Finally, for an investor contemplating the purchase of foreign bonds or equities, the expected future annual percentage change in the exchange rate is also important. Study after

study has shown that there is no reliable way to forecast this. At best, you can make an estimate that is justified in theory, knowing that in practice it will not turn out to be accurate. That is what we have chosen to do here. Specifically, we have taken the difference between the yields on ten-year government bonds as our estimate of the likely future annual change in exchange rates between two regions. This information is summarized in the following table:

Annual Exchange Rate Changes Implied by Bond Market Yields

	To AUD	To CAD	To EUR	To JPY	To GBP	To USD	To CHF	To INR
From								
AUD	0.00%	-1.21%	-1.74%	-3.87%	-1.10%	-0.65%	-2.97%	2.05%
CAD	1.21%	0.00%	-0.53%	-2.66%	0.11%	0.56%	-1.76%	3.26%
EUR	1.74%	0.53%	0.00%	-2.13%	0.64%	1.09%	-1.23%	3.79%
JPY	3.87%	2.66%	2.13%	0.00%	2.77%	3.22%	0.90%	5.92%
GBP	1.10%	-0.11%	-0.64%	-2.77%	0.00%	0.45%	-1.87%	3.15%
USD	0.65%	-0.56%	-1.09%	-3.22%	-0.45%	0.00%	-2.32%	2.70%
CHF	2.97%	1.76%	1.23%	-0.90%	1.87%	2.32%	0.00%	5.02%
INR	-2.05%	-3.26%	-3.79%	-5.92%	-3.15%	-2.70%	-5.02%	0.00%

Our approach to valuing commercial property securities as an asset class is hindered by a lack of historical data about rates of dividend growth. To overcome this limitation, we have assumed that markets are fairly valued today (i.e., the expected supply of returns equals the expected returns demanded by investors), and “backed out” the implied growth rates to see if they are reasonable in light of other evidence about the state of the economy (see below). This analysis assumes that investors require a 2.5% risk premium above the yield on real return bonds to compensate them for the risk of securitized commercial property as an asset class. The following table shows the results of this analysis:

Country	Real Bond Yield	Plus Commercial Property Risk Premium	Less Dividend Yield on Commercial Property Securities	Equals Expected Rate of Future Dividend Growth
Australia	2.50%	2.50%	6.6%	-1.6%
Canada	1.89%	2.50%	5.0%	-0.6%
Eurozone	1.95%	2.50%	3.1%	1.4%
Japan	1.02%	2.50%	1.3%	2.2%
Switzerland	1.73%	2.50%	3.4%	0.8%
United Kingdom	1.51%	2.50%	2.4%	1.7%
United States	2.52%	2.50%	4.3%	0.7%

A very rough way to test the reasonableness of these growth assumptions is to compare them to the expected real annual change in commercial rental income over the next five years. If you think the real growth estimates are too high, that implies overvaluation. On the other hand, if you think they are too low, that implies undervaluation.

Our commodities asset class valuation analysis is focused on two drivers of near term returns: the “roll yield” (sale of futures contracts at close to the spot price as they mature, and reinvestment of the proceeds in a new, longer-dated contract) and unexpected changes in the spot price. With respect to the roll yield, the DJ AIG commodities index futures contract traded on the Chicago Board Options Exchange (CBOT) is currently contangoed, with a (5.3%) difference between the near and far term contract prices. With respect to the spot price, over the 1991 to 2005 period, the DJ AIG had an average value of 107.6, with a standard deviation of 21.9. The June 30 closing price of 173.2 was about three standard deviations above the average. In light of history, the probability of spot price declines is much higher than the probability of spot price increases. Hence, we conclude that the balance of evidence suggests that commodities are overvalued today.

Our approach to assessing the current value of volatility (as measured by the VIX index) is similar to our approach to commodities. Between January 2, 1990 and December 30, 2005, the average value of the VIX was 19.45, with a standard deviation of 6.40. The one standard deviation (67% confidence interval) range was 13.05 to 28.85, and the two standard

deviation (95%) range was from 6.65 to 32.25. On June 30, 2006, the VIX closed at 13.08. As you can see, this is at the low end of the 67% confidence interval. It also seems low in light of conditions in the financial markets. Hence, we conclude that volatility is undervalued today.

Sector and Style Rotation Watch

The following table shows a number of classic style and sector rotation strategies that attempt to generate above index returns by correctly forecasting turning points in the economy. This table assumes that active investors are trying to earn high returns by investing today in the styles and sectors that will perform best in the next stage of the economic cycle. The logic behind this is as follows: Theoretically, the fair price of an asset (also known as its fundamental value) is equal to the present value of the future cash flows it is expected to produce, discounted at a rate that reflects their relative riskiness.

Current economic conditions affect the current cash flow an asset produces. Future economic conditions affect future cash flows and discount rates. Because they are more numerous, expected future cash flows have a much bigger impact on the fundamental value of an asset than do current cash flows. Hence, if an investor is attempting to earn a positive return by purchasing today an asset whose value (and price) will increase in the future, he or she needs to accurately forecast the future value of that asset. To do this, he or she needs to forecast future economic conditions, and their impact on future cash flows and the future discount rate. Moreover, an investor also needs to do this before the majority of other investors reach the same conclusion about the asset's fair value, and through their buying and selling cause its price to adjust to that level (and eliminate the potential excess return).

We publish this table to make an important point: there is nothing unique about the various rotation strategies we describe, which are widely known by many investors. Rather, whatever active management returns (also known as "alpha") they are able to generate is directly related to how accurately (and consistently) one can forecast the turning points in the economic cycle. Regularly getting this right is beyond the skills of most investors. In other words, most of us are better off just getting our asset allocations right, and implementing them via index funds rather than trying to earn extra returns by accurately forecasting the ups and downs of different sub-segments of the U.S. equity and debt markets. That being said, the

highest rolling three month returns in the table give a rough indication of how investors expect the economy and interest rates to perform in the near future. *The highest returns in a given row indicate that most investors are anticipating the economic and interest rate conditions noted at the top of the next column* (e.g., if long maturity bonds have the highest year to date returns, a plurality of bond investor opinion expects rates to fall in the near future). Comparing returns across strategies provides a rough indication of the extent of agreement (or disagreement) investors about the most likely upcoming changes in the state of the economy.

As a further check, we have also included rows that describe the typical cycles in the markets for commercial property and commodities. However, rather than being leading indicators of future economic conditions, they tend to coincide with current economic and interest rate conditions (i.e., those at the top of the same column, rather than the next one to the right). When many investors share the same expectations about future economic conditions, one would expect to see alignment between bond and equity market year-to-date returns, and conditions in commodity and commercial property markets. However, we also note that this is when markets are most fragile; large moves can occur if something happens to change these closely aligned expectations. In contrast, when investors do not share the same expectations for the future, you would expect to see misalignment between year-to-date returns in bond, equity, commodity and commercial property markets.

Three Month Rolling Nominal Returns on Classic Rotation Strategies in the U.S. Markets

Rolling 3 Month Returns Through June, 2006

<i>Economy</i>	Bottoming	Strengthening	Peaking	Weakening
<i>Interest Rates</i>	Falling	Bottom	Rising	Peak
<i>Style and Size Rotation</i>	Small Growth (DSG) -6.83%	Small Value (DSV) -2.00%	Large Value (ELV) 1.11%	Large Growth (ELG) -3.53%
<i>Sector Rotation</i>	Cyclicals (IYC) -1.78% Technology (IYW) -8.86%	Basic Materials (IYM) 0.67% Industrials (IYJ) -1.31%	Energy (IYE) 5.15% Staples (IYK) 0.24%	Utilities (IDU) 5.96% Financials (IYF) -0.19%
<i>Bond Market Rotation</i>	Higher Risk (LQD) -0.50%	Short Maturity (SHY) 0.64%	Low Risk (TIP) -0.01%	Long Maturity (TLT) -1.81%

Economy	Bottoming	Strengthening	Peaking	Weakening
Interest Rates	Falling	Bottom	Rising	Peak
Commodities				
Commodity Inventories	Peaking	Falling	Bottoming	Rising
Spot Prices	Bottoming	Rising	Peaking	Falling
Futures Prices Relative to Spot Price	Contango (futures higher than spot)	Uncertain	Backwardation (futures lower than spot)	Uncertain
Profitability of long commodity futures position, before diversification and collateral yields	Negative (falling spot and negative roll yield)	Uncertain (rising spot, uncertain roll yield)	Positive (rising spot and positive roll yield)	Uncertain (falling spot, uncertain roll yield)
Comm'l Property				
Commercial Property Vacancy Rates	Peaking	Falling	Bottoming	Rising
Rents	Low	Rising	High	Falling
New Construction Completion (space coming onto the market)	Falling	Bottoming	Rising	Peaking
Property Valuation Ratios	Bottoming	Rising	Peaking	Falling
Expected Future Property Returns	Peaking	Falling	Bottoming	Rising

Will Fundamental and Dividend Weighting Deliver What They Promise?

With the launch in Spring 2006 of a new family of exchange traded funds by Wisdom Tree Investments, "dividend weighting" has joined the "fundamental weighting" approach pioneered by Research Affiliate's Bob Arnott as a challenger to traditional market capitalization index weighting. Nobody can argue with the fact that both Wisdom Tree and Arnott have identified anomalies that in the past generated significant alpha compared to market cap weighted indexes. However, two critical questions remain unanswered at this point: what caused these anomalies to occur, and will they continue to exist in the future?

Securities markets are not perfectly efficient, and over and undervaluations occur, for complex reasons. The return generating process for a security has three main parts: (1) changes at the company level (e.g., variations in customer needs, technology, competitor offerings, cost positions, etc.); (2) investors' forecasts for how those changes will evolve and affect the company in the future; and (3) investors' forecasts for how they expect *other* investors' perceptions and behavior to evolve.

Investors find it harder to project future results (and therefore to estimate security values) for some types of companies than for others, including those that face substantial competition, companies in fast changing industries, and companies that pay no dividends. The higher the uncertainty about a company's return generating process, the more likely that some investors will make incorrect forecasts. Since excessive optimism and overconfidence are natural human biases, incorrect forecasts will most often lead to overvaluation.

These overvaluations often receive a further impetus from another source. There is constant variation in the percentage of investors who are using fundamental strategies (which seek to identify undervalued securities, in the belief that market prices will eventually converge to them) and the percentage who trade by following market trends (i.e., on the basis of their forecasts for how other investors will behave). Unsurprisingly, these momentum investors are usually most prevalent in the markets for securities that are hardest to accurately value. Their presence can cause overvaluations to persist, as fundamental investors are sometimes reluctant to absorb inferior returns for a long period until momentum reverses and the price of its security returns to a more rational value. For example, many fundamentally oriented fund managers believed that technology stocks, particularly after 1999, were seriously overvalued. However, few were willing act on this belief (e.g., via buying put options or shorting the stocks

in question) for fear that the low short term returns that would result would cause their funds to lose assets.

As critics have noted, a market capitalization weighted index will give too much weight to securities that are overvalued, and too little to securities that are undervalued. The question is, can we design an index that reduces exposure to the factors that drive over and undervaluation?

Indexes that use so-called "fundamental" weighting (based on a company's relative share of book asset value or revenues) or dividend weighting (based on a company's share of total dividends paid) have, based on their historical performance, managed to do this in the past, and have outperformed comparable market capitalization weighted indexes. What caused this result?

One of the key assumption underlying fundamentally weighted indexes is that focusing on non-market capitalization measures of size helps to avoid situations where overvaluation is most likely to occur. In the context of our valuation discussion above, this implies that larger companies are either less likely face fast changing businesses environments, and/or investors are less uncertain about how these changes will affect a larger company. This also implies less exposure to the actions of momentum investors. We suspect that all of these assumptions are, to some extent, true. Large size (as measured by revenues or assets) often implies that a company has been successful at creating a stable "business ecosystem" in which it can thrive. To be sure, as the U.S. automakers can attest, this stability does not last forever. However, even when it gives way to a period of rapid change, size often buys a company more time to adapt, compared to smaller companies that lack a similar resource cushion.

The assumptions that underlie the success of dividend weighting appear to be similar, and perhaps even stronger. Larger companies are usually the ones paying larger dividends, so the size arguments made above also apply here. But paying large dividends should also imply that a board of directors has confidence in the sustainability of a company's competitive advantages, even in the face of rapid change. Hence, the presence of dividends tends to reduce investors' uncertainty about their estimates of a security's fair value, and thus avoid the emergence of serious overvaluations.

However, understanding why outperformance occurred in the past is not the same as believing it will happen again in the future. The disappearance in recent years of the so-called

size premium is a perfect example of this. Once informed that small stocks (by market capitalization) had historically outperformed large stocks, investors bought more of them, bid up their prices, lowered their returns and mostly eliminated the expected outperformance.

The question we have to ask is whether the same thing will happen with fundamental and dividend based indexing. What is to prevent hedge funds and other smart traders (not to mention the growth of fundamentally weighted index funds) from bidding up the price of those stocks with the highest weights in a fundamental index, causing their expected excess returns to be eliminated, while having the exact opposite impact on fundamentally smaller stocks that apparently have been systematically overvalued in the past? In this sense, the very discovery of the fundamental and dividend weighting anomalies should cause market capitalization based indexes to become more efficient over time.

To argue this won't be the case, you need to believe there are significant and durable obstacles that will prevent this arbitrage from occurring. In this age of intense competition for alpha, we don't believe these obstacles exist. As a result, we expect fundamental and dividend based index products to continue to outperform for a time, but then quite closely match the performance of market capitalization weighted products as the historical anomalies are arbitrated away.

Another Month, Another Crop of New Commodity Products

Commodities investing is getting to be like English weather. If you don't like what's on offer today, just wait a bit, and it will change. This past month has seen the introduction of two new commodity indexes. The Lehman Brothers Commodity Index contains twenty commodities and annually resets their weights based on their futures trading volume. These weights then adjust during the year based on price changes. The current weight of energy commodities is about 53%, with metals at 27% and agricultural products at 20%. The Merrill Lynch Commodities Index contains eighteen commodities. They are initially selected based on their futures market liquidity, and then weighted by their importance in the global economy. Their current weights are energy, 60%, Metals, 17%, and agriculturals, 23%.

The following table shows how these weightings compare with other commodity indexes (GSCI = Goldman Sachs Commodities Index; DBLCI = Deutsche Bank Liquid

Commodities Index; RICI = Rogers International Commodities Index; DJAIG = Dow Jones AIG Commodities Index):

	GSCI	MLCX	DBLCI	LBCI	RICI	DJAIG
Energy	74%	60%	55%	53%	44%	33%
Metals	12%	17%	23%	27%	21%	26%
Agric.	14%	23%	22%	20%	35%	41%
<i>High-Low Weight</i>	<i>62%</i>	<i>43%</i>	<i>33%</i>	<i>33%</i>	<i>23%</i>	<i>15%</i>

When it comes to weighting, we will reiterate a comment we've made before: the most reliable source of commodity index returns over time is the "diversification yield." This is the benefit that results from holding a portfolio of commodities whose returns have low correlations with each other (see, for example, "The Tactical and Strategic Value of Commodity Futures" by Erb and Harvey). However, as Kat and Oomen note in a new paper ("What Every Investor Should Know About Commodities"), the correlations between the returns on different commodity groups (i.e., energy, metals, and agriculturals) are much lower than between the returns on commodities within each of them. Hence, the diversification yield should be maximized (and volatility minimized) when different commodity groups are held in roughly equal proportions. Hence our continued preference for the Dow Jones AIG Commodities Index. As you can see in the table above (specifically, the high minus low weight row), it is the most balanced of all the commodity indexes available today.

However, there is more to the new index products than simply their weighting schemes. Like the Deutsche Bank Liquid Commodities Index, the Merrill index also will employ a flexible approach to "rolling" its contracts. This refers to selling maturing contracts (to avoid having to deliver the physical commodities) and reinvesting the proceeds in longer-dated ones. When futures prices are lower than spot prices (known as "backwardation") this produces a positive "roll yield" which in theory is an insurance premium provided by sellers of physical commodities to buyers of futures contracts. When futures prices are higher than spot prices (known as "contango"), the roll yield is negative. There is disagreement about what causes this. One explanation is an excess of futures buyers relative to physical sellers. Another is

based on heightened supply and delivery risks in the physicals market. Whatever the cause, contangoed commodity prices reduce the profitability of investing in long-only commodity index products. For this reason, providers of those products are now experimenting with different approaches to reducing negative roll yields during periods when prices are contangoed. In the case of the Merrill Lynch product, this involves selling contracts further away from their maturity date, and reinvesting in even longer-dated futures, on the theory that the degree of contango (and thus the size of the negative roll yield) will be lower.

This past month also saw the launch of two interesting new commodities products. The first was by ABN AMRO and Lyxor in Germany, where a new ETF will track the Rogers International Commodities Index. The second was in the United States, where Barclays launched two new structured notes whose returns are linked to the GSCI and DJAIG. Called "iPath Exchange Traded Notes" (ETNs) they are AA rated debt securities issued by Barclays Bank PLC that are listed on the New York Stock Exchange. Upon either their redemption or maturity in 2036, they will pay a return equal to the principal amount times the cumulative return on the relevant commodities index less a cumulative expense charge of .75% per year. They carry no sales load, but you will have to pay a brokerage commission to buy them. Besides their low annual expense charge, the most attractive feature of the iPath ETN product is its tax treatment: since the only payment to an investor occurs when the note is redeemed or matured, taxes are deferred and, according the prospectus, any profits earned should be taxed as capital gains. For taxable investors, these ETNs represent a significant improvement over both exchange traded funds and mutual funds commodity index products. However, this tax treatment is not certain. As the iPath website notes, "Absent an administrative or judicial ruling to the contrary, iPath ETN securities should be treated for all tax purposes as pre-paid contracts with respect to the relevant index. If the iPath ETNs are so treated, investors will recognize capital gain or loss upon the sale, redemption or maturity of their iPath ETNs in an amount equal to the difference between the amount they receive at such time and their tax basis in the securities. The United States Federal income tax consequences of an investment in the iPath ETNs are uncertain. It is therefore possible that the Internal Revenue Service may assert an alternative treatment. Because of this uncertainty, investors are urged to consult their tax advisor as to the tax consequences of an investment in the iPath ETNs." Given the way the IRS treated PIMCO, an adverse federal tax ruling is certainly something to worry about. We'd be a

lot more enthusiastic if the tax treatment were clearer at this point. One other unknown is the extent to which liquid secondary market for these ETNs will develop. This is crucial for people who want to buy and sell them before maturity, for example as part of a rebalancing program. At this point, it is too early to tell if this will be the case. Still, assuming the tax issue is favorably resolved and a secondary market develops, this is an excellent product structure.

On the commodities research front, we also read some interesting reports over the past month. In “Commodity Prices and Monetary Policy”, Professor Jeffrey Frankel from Harvard argues that low real interest rates lead to high commodity spot (physical) prices, and vice versa. With the world’s central banks now tightening policy, and real rates rising, the implications are clear. Franke’s research is supported by findings in a Bank of Canada working paper (“Forecasting Commodity Prices: GARCH, Jumps, and Mean Reversion” by Bernard, Khalaf, Kichian and McMahon) that finds that commodity spot prices tend to mean-revert over time. Closely related to this is a paper by Craig Pirrong, “Momentum in Futures Markets.” He finds that momentum in futures markets has a correlation of .26 to .30 with momentum in equities markets, and that it typically reverses after about one year. In another paper, “Momentum in Commodity Futures Markets”, Miffre and Rallis find that momentum strategies that buy futures contracts on backwardated, high volatility commodities and sell futures contracts on contangoed high volatility commodities with high volatilities have historically earned attractive returns that have a low correlation with those on other asset classes. This is quite similar to the strategy tracked by the MLM Index, produced by Mount Lucas Management. In some countries (e.g., Canada), products are available that track this index. However, as we noted in our April 2006 issue, the MLM’s returns have a low correlation with those on long-only commodity indexes like the GSCI or DJAIG; in truth it is more of a hedge-fund type product.

What Do Bond Spreads Tell Us?

With all the talk these days about “widening” and “narrowing” bond spreads, we thought we’d take a deeper look at this timely and interesting subject. Let’s start with a simple definition: a “spread” is the difference between two yields, say on BBB or AAA rated bonds issued by a corporation, and a ten year bond issued by the United States Treasury. For example, at the end of June, the spread between AAA bonds and the ten year Treasury was .76%, and the spread between BBB bonds and the ten year Treasury was 1.67%. These spreads tend to change over time. The obvious question is why? To answer that, we have to understand what these spreads represent. Unfortunately, nobody quite knows the answer to that question. As Exley and Smith note in “Modeling Corporate Bonds”, “there is no perfect or generally accepted technique” for modeling yield spreads. The basic problem is that everyone’s initial intuition – that these spreads represent compensation for default risk – is proven wrong by the data. At first glance, historical default rates are well below what are often (and falsely) termed “credit spreads.”

In recent years, the mystery of bond spreads has been reinforced by the development of markets for credit derivative products, which apparently isolate the premium for bearing default risk from other components of the bond spread. For example, in a simple credit default swap (CDS), one party (think of them as the insured) agrees to make a specified stream of payments to another party (the provider of insurance) for a certain period of time. If during this period a “credit event” (e.g., a default) occurs on a specified instrument (e.g., a bond issued by company ABC), the insurer will make a specified payment to the insured. Repeated studies have found that CDS pricing is well below bond spreads, particularly for investment grade (AAA to BBB rated) bonds (e.g., see “How Much of the Corporate-Treasury Yield Spread is Due to Credit Risk?” by Huang and Huang).

So what might account for the difference? Different studies have tested four hypotheses. The first is that neither historical default rates nor CDS pricing fully captures the extent of credit risk which investors demand compensation for bearing when they buy a corporate bond. Essentially, there are three different aspects to default risk: (1) the probability an issuer will default; (b) the extent to which a bondholder will recover principal in the case of default; and (c) the extent to which defaults by different borrowers, and subsequent recoveries, will be correlated with each other.

In “Common Failings: How Corporate Defaults are Correlated”, Das, Duffie, Kapadia and Saita claim that existing default risk models are too optimistic in their correlation assumptions. This conclusion is echoed by D’Amato and Remolona in “The Credit Spread Puzzle.” They note that, unlike government bonds and equities, corporate bonds have asymmetric returns. While the upside return on a government bond is limited, so too is its downside risk. In contrast you can lose everything on an equity investment, or make a fortune. But with corporate bonds, you can both lose everything (in the case of a severe default), but still have a relatively limited upside. As a result, D’Amato and Remolona note that the returns profile for corporate bonds is inherently negatively skewed. Moreover, because it is so hard to diversify default risk, unexpected downside losses must be considered inevitable for investors in corporate bonds. In “Calibration of the Structural Model of Corporate Bonds Spreads”, Lerner and Wu make another point: recovery rates (in the case of default) and the tax treatment of any proceeds received are both highly uncertain, while many models treat them as constants.

The second hypothesis is that the different tax treatment of interest on corporate bonds (which is taxable at the state level in the United States) and federal government bonds (which is not taxable) accounts for part of the bond spread. Different researchers have found support for this.

The third explanation of the bond spread is that part of it represents compensation for bearing liquidity risk. Other researchers have found that liquidity risk is a priced risk factor in the equity markets (e.g., “Is There a Global Liquidity Factor” by Christof Stahel). It is also clear that even in the best of times, the markets for many corporate bonds are relatively illiquid (e.g., have high transaction costs, and wide bid/ask spreads). So it comes as no surprise that two sets of researchers have found that liquidity risk (i.e., the tendency of liquidity to go away when you want to sell your asset) accounts for a significant part of the bond yield spread (see “Liquidity Risk Premia in Corporate Bond Markets” by de Jung and Driessen, and “Is Liquidity Risk Priced in the Corporate Bond Market?” by Downing, Underwood, and Xing).

Liquidity risk is closely related to the fourth potential contributor to corporate bond spreads. As we have noted in the past, you can divide historical returns on most asset classes into two periods: one characterized by relatively high returns and low volatility, and one characterized by the opposite conditions. The risk that the system will shift from the former to the latter regime is known as “jump risk.” In “Explaining the Level of Credit Spreads”,

Cremers, Driessen, Maenhout and Weinbaum find that a jump risk premium is a key component of the bond yield spread. Discussions of “jump risk” in the equity market lead to the implied volatility (i.e., expected standard deviation of future returns) on equity index options, which is measured by the VIX index. VIX futures are a valuable portfolio diversifier because they payoff (rise in value) when increasing volatility is typically causing equity prices to fall. In “Measuring Default Risk Premia”, Berndt, Douglas, Duffie, Ferguson, and Schranz find that changes in credit risk premia strongly depend on changes in the VIX. This finding is echoed in another paper, “Financial Crises, Implied Volatility and Stress Testing” by Allan Malz. This leads to an important point: from a portfolio perspective, this linkage between equity and corporate bonds suggests that the diversification benefits from the latter are likely to be low.

So where does this leave us? Some have suggested that it is useful to decompose the bond yield spread into two parts. The first is the difference between the yield on AAA rated bonds and the yield on the ten year Treasury bond. Because default risk on AAA rated companies is very low, this spread may tell us more about prevailing liquidity and jump risk conditions. The second is the difference between BBB and AAA rated bonds, which may tell us more about the level of compensation required by investors for bearing default risk. For example, between August and October, 1998 (around the time of the Russian debt default and Long Term Capital Management crises), the AAA-Treasury spread jumped from 1.18% to 1.84%, while the BBB-AAA spread increased by much less, from .62% to .81%.

The following table shows the average level of these spreads between January, 1970 and December, 2005 (based on monthly Federal Reserve data), along with their standard deviations and 67% (average plus or minus one standard deviation) and 95% (average plus or minus two standard deviations) confidence range.

	AAA – 10 Year Treasury	BBB-AAA
Average	.97%	1.08%
Standard Deviation	.47%	.42%
Avg. +/- 1 SD	1.44% - .50%	1.51% - .66%
Avg. +/- 2 SD	1.91% - .03%	1.93% - .23%

At 30 June, 2006 the AAA minus 10 year Treasury spread was .76%., down from .83% at the end of May. As you can see, this was below the long-term average compensation for bearing liquidity and jump risk (assuming our model is correct). This seems especially odd given the rise in the VIX during June. The BBB minus AAA spread was .91%, up slightly from .83% at the end of May. Again, this was below the long-term average compensation for bearing default risk. In sum, the current spreads lead us to conclude that it is more likely that corporate bonds today are overvalued than undervalued.

As a result, we are switching the funds we use to implement our allocation to investment grade bonds away from those (like VBMTX and AGG) that track a broad based index (the Lehman Brothers Aggregate, which gives corporates a 19% weight, along with 38% to government and government related issuers and 43% to mortgage and other asset backed securities) and to VBIIX and IEF, which invest in intermediate maturity Treasury Bonds.

Volatility is Up: So What?

The VIX Index measures the 30 day future volatility implied by the current price of options on the S&P 500 Index. Although it tends to underestimate realized volatility (e.g., by an average of 4.77%, based on data from February 1990 to December 2005), adding VIX futures to a portfolio can provide substantial diversification benefits (e.g., see our analysis “Volatility as an Asset Class”, or “Optimal Investment in Variance Swaps Under Stochastic Volatility” by Egloff, Leippold and Wu). The VIX Index is also important because of what it can tell us about changes in financial market conditions. A recent paper by Prachi Deuskar (“Extrapolative Expectations: Implications for Volatility and Liquidity”) describes how a rise

in expected volatility (measured by the VIX) can affect investor behavior, causing them to withhold liquidity from the market. In turn, this fall in liquidity magnifies the impact of any news that contradicts the prevailing consensus, which increases realized volatility, and, via a feed-forward mechanism, further raises investors' expectations of future volatility. This is the financial markets' version of Murphy's Law, with volatility increasing and liquidity disappearing at the worst possible time. It is also the reason why volatility tends to be clustered in high and low regimes.

Changes in the VIX can help us anticipate these regime changes, and position ourselves accordingly. For example, a recent paper by Arisoy, Salih and Akdeniz ("Is Volatility Priced in the Securities Market?") found that firms classified as "small cap" and "value" perform worse than "large cap" and "growth" firms when volatility increases. The authors hypothesize that investors require a volatility risk premium to hold small cap and value firms, which accounts for their higher returns compared to their large cap and growth counterparts.

It is also helpful to look at historical episodes when the VIX sharply increased, to see how other asset classes performed. One way of doing this is by calculating correlations over short periods of time. However, we think it is more vivid to look at actual real returns. The following table shows the real U.S. dollar returns on different asset classes and two hedge fund styles during three quarters when the VIX sharply increased: the third quarter of 1998 (Russian debt default and Long Term Capital Management hedge fund failure); and the third quarters of 2001 and 2002 (terrorist attacks and technology bubble collapse).

	3 rd Qtr 1998	3 rd Qtr 2001	3 rd Qtr 2002
U.S. Real Return Bonds	2.3%	.5%	7.3%
Global Bonds	8.0%	2.8%	6.4%
Global Property	(11.8%)	(10.6%)	(5.8%)
Commodities (DJAIG)	(5.5%)	6.7%	(5.7%)
Timber	.3%	(.1%)	.7%
Global Equity	(12.2%)	(18.8%)	(15.8%)
Equity Market Neutral	.3%	5.6%	3.3%
Global Macro	12.9%	15.5%	(1.5%)
Equity Volatility VIX	107.4%	55.7%	67.4%

As you can see, while history is always an imperfect guide to the future, it suggests that equities (domestic, foreign and emerging market), property, and perhaps commodities could be in for a bit of a rough ride if and when the global economy suffers a sharp fall in demand. As we note elsewhere (see our Asset Class Valuation Section), this is in line with our view that these asset classes may well be overvalued today. Unfortunately, we still lack a product that lets individual investors easily invest in VIX futures, in the same way they can invest in other commodity futures today. Still, the table above shows that a well-diversified portfolio should be able weather the storms that lie ahead, assuming the VIX is on target.

When And How Should You Rebalance?

Recent swings in asset classes have inevitably caused many investors to think about rebalancing their portfolios. As we have noted in the past, we distinguish between four different approaches to rebalancing, based on the objective being pursued and whether it is carried out automatically or episodically. These four logics are summed up in the following table:

	<i>Goal: Increase Returns</i>	<i>Goal: Limit Risk</i>
<i>Done Automatically</i>	Under and Overweight	Rebalance Back to Target
<i>Done Episodically</i>	Time Markets	Avoid Overvaluations

Automatic rebalancing to limit risk usually involves adjusting asset class allocations back to their target weights at regular time intervals. Episodic rebalancing to limit risk is based on an investor's belief that he or she can identify – and reduce exposure to – asset classes that have become visibly and substantially overvalued. In contrast, market timing involves episodic adjustment of asset class weights based on a more comprehensive belief that an investor can consistently identify asset classes that are both over and undervalued. The global macro hedge fund style reflects this logic. Finally, automatic rebalancing can also be used to pursue higher returns, by (a) rebalancing only when at least one asset class has become significantly over or underweight relative to its target, and (b) adjusting the most overweight asset class to a specified percentage below its target, and the most underweight asset class to an equal percentage above its target. This approach aims to systematically earn higher returns by taking advantage of financial markets' tendency to overshoot and then revert back to the mean. We recommend this approach, along with episodic rebalancing aimed at limited the risk posed by situations of severe overvaluation.

Let's look more closely at the logic that lies behind systematic over and underweighting. We assume that an investor's primary goals are maximizing the probability of fully funding a long-term liability (say, accumulating a target amount of funds by his or her expected retirement date), while staying within some type of risk constraint. In order to achieve these goals, our investor has to make two decisions: (1) how much of his portfolio to allocate to different asset classes, and (2) the rebalancing rule to use. This investor's views on market efficiency should logically drive his or her decision regarding rebalancing.

If you believe that markets are strongly efficient – that is, that they are always fairly valued, given the information available – then the only reason to rebalance is to stay within your risk constraint; the rebalancing strategy you choose cannot logically be a source of excess returns. However, staying within your risk constraint involves costs, in the form of transaction charges and, possibly, taxes as well. Since rebalancing involves selling investments in those

asset classes whose weights are above their targets, while purchasing investments in asset classes below their targets, it leads to the realization of capital gains. If the assets in question are held in taxable accounts, this will trigger an additional cost.

However, while the costs of rebalancing are quite real, the potential risk reduction gains may not be, as they are based on the assumption that asset class standard deviations and correlations remain stable over time. An examination of historical time series data shows that this is not the case; both tend to vary, depending on the period studied. Taken together, this leads to an argument against any rebalancing at all in a market that is strongly efficient.

Now let us consider the situation facing an investor who does not assume that markets are strongly efficient. Let us say he or she shares our view that financial markets are a complex adaptive system. In this view, active managers are constantly searching for superior information and superior models that help them to generate superior forecasts of future asset prices. From time to time, the information and models used by active managers can become self-reinforcing, as, for example, when many investors are using a momentum-based approach. These periods will tend to generate overconfidence, and overvaluation of some asset prices, or, possibly, overvaluation of an entire asset class.

Eventually, these overvaluations will reverse, and possibly lead to excessive negative momentum. In this system, while markets are attracted to equilibrium and efficiency (as evidenced by their tendency to mean revert), they seldom attain it. Under these conditions, not only can systematic rebalancing limit risk, but it may also generate additional returns, by selling overvalued assets and buying undervalued ones. However, the achievement of these potential benefits once again requires an investor to incur transaction, and potentially tax costs as well.

We performed a simulation analysis to quantify the potential impact of different approaches to systematic portfolio rebalancing. Because our focus is on rebalancing strategy, we assume that the investor does not believe that asset class risks and returns can be successfully forecasted. As a result, he allocates equal portions of his portfolio to ten asset classes: (1) real return bonds; (2) investment grade bonds; (3) foreign currency bonds; (4) domestic commercial property securities; (5) foreign commercial property securities; (6) a commodity index; (7) timber; (8) domestic equity; (9) foreign developed market equity; and (10) emerging markets equity.

We analyzed six different rebalancing strategies. The first rebalances back to the target asset class weights (i.e., ten percent each) at the end of each year. The next four only rebalance back to the target weights when one or more asset classes is at least 5%, 10%, 15%, or 20% above its target weight. For example, the 20% strategy would not rebalance unless one asset class accounted for more than 30% of the portfolio. The last strategy never rebalances.

In our simulation analysis, we used historical distributions of real returns for each asset class over the 1989 to 2004 period. We used a correlation matrix calculated from the same data. Finally, to (roughly) capture the tendency of markets to trend, the return on real return bonds has a .2 serial correlation with the return on this asset class in the previous year. We also included one-way rebalancing costs that varied from 35 basis points to 135 basis points.

For each rebalancing strategy, we ran 10,000 simulations, and calculated the expected value of an initial 1,000 dollar investment 20 years hence. We also calculated the standard deviation of that final portfolio value, as well as the probability that it would exceed a target of 3,000 dollars in year 20 (e.g., assume the investor is trying to fund a liability with an expected value of 3,000 in year 20). The following table shows the results of our analysis:

Trigger	Expected Value Yr 20	Std. Deviation	Expected Value/Std Deviation	Probability >= 3,000 in Yr 20
0%	3,871	1,839	2.10	63%
5%	3,918	1,870	2.10	64%
10%	4,004	1,995	2.01	65%
15%	4,061	2,055	1.98	65%
20%	4,120	2,162	1.91	65%
No Rebal	4,220	2,420	1.74	66%

This table makes clear the potential confusion that can arise in discussions about rebalancing. The first column shows the different rebalancing strategies we tested. If we look only at the second column, we would conclude that rebalancing doesn't make sense, as never rebalancing results in the highest expected portfolio value at the end of 20 years.

However, a look at the third column shows that reduced rebalancing frequency also leads to higher portfolio risk, as measured by the variability of the portfolio's value in twenty years time. And as column four shows, the trade-off between return and risk actually worsens the longer rebalancing is put off.

As previously noted, another way of defining risk is in terms of the probability of achieving the specified accumulation target at the end of twenty years (the probability of falling short of this goal is 1 minus the probability of success). The fifth column in the table shows that, because it affects both expected return and risk, the impact of rebalancing strategy on the probability of achieving the accumulation goal is, while positive, marginal at best. To put it differently, the beneficial impact of delayed rebalancing on returns tends to be offset by its detrimental impact on risk. As you can see, most of the improvement from rebalancing is achieved by setting a trigger of 10% to 15% above a portfolio's target weights. Completely eliminating rebalancing adds considerably more risk, for a minimal additional increase in the probability of achieving the investor's accumulation target.

Economic Warning Indicators Update

We produce our primary economic and asset class return outlook each March. We update it in September with the results of the IMF's semi-annual forecast. In between, in June and December, we produce shorter updates to our list of economic early warning indicators.

As I write this update, I can't get a document I recently read out of my mind. "Retirement Savings by the Numbers" by Fernandez and Brandon was produced by the Securities Industries Association, the industry's main lobbying group in Washington, DC. Here is the passage that most disturbed me: "We find there has been a sharp increase in the share of U.S. households that are not adequately preparing for retirement and that will confront significant reductions in their standards of living." This is political dynamite. And the fuse is burning. Another recent report from McKinsey found "rapidly rising anxiety [among baby boomers] around their financial risks in retirement." Just as important, these individual anxieties are compounded by a more comprehensive and growing, sense of concern (I hesitate to use the word "dread", though it might not be inaccurate) about the overall state of the economy. The symptoms are clear to see: stagnant wages, despite rising productivity; flat investment, despite record corporate profits; widening gaps in the distribution of income and wealth, despite a twenty year plus economic boom; ever-rising competitive pressures at many companies; jobs at ever higher levels of skill moving abroad, and being replaced, if at all, with lower wage jobs in non-traded service industries; rising consumer borrowing and bankruptcies;

teetering housing markets; and a building resentment on the part of the middle class that government seems to be helping (with their taxes) everyone but them, even as the unfunded liabilities for their retirement benefits grow to untenable proportions. What's behind these symptoms?

As I see it, three driving forces are at work. The first is falling barriers to the movement of goods, capital, and in many cases people around the world. The second is the development and adoption of low cost information and communication technologies that have substantially expanded the opportunities to exploit falling capital and trade barriers. And the third is the entry into the world economy of China and India, with their masses of relatively well-educated and ambitious workers. Taken together, these three forces have combined to produce an enormous supply shock to the world economy, that has let loose powerful deflationary forces that are colliding head-on with the borrowing and asset price booms created by Western nation's repeated use of monetary stimulus to keep their economies growing strongly since the LDC debt crisis broke in 1982. I have no doubt that these forces will eventually precipitate a very deep economic, and, perhaps political crisis. Nobody can say in advance what will trigger it; suffice to say there are many possibilities. (Iran? North Korea? Venezuela? Al-Qaeda? A failed hedge fund?) As I wrote in March, the way the eventual crisis turns out fundamentally depends on the attitudes and actions of three groups: Chinese peasants, Iranian youth, and the American middle class. Each of them faces choices that can lead toward more cooperative or more conflict-laden solutions.

But in the short-term, it is arguably the respective leaders' fears of these three groups that are making a bad situation even worse. Despite the clear need of China to slow its breakneck pace of credit, investment, and export growth, and shift demand toward domestic consumption, its leaders hesitate to take the necessary steps for fear of the domestic social and political instability a temporary economic slowdown could trigger. In Iran, the government is spending almost all of its enormously high oil earnings to support economic growth and provide opportunities for a large population of young people whose primary goal is material well being rather than fundamentalist purity. And so President Ahmadinejad continues to use his aggressive rhetoric (which, not coincidentally, keeps oil prices high) despite the threat that it will trigger a military conflict. In the United States, despite the critical need to reduce its current account deficit, government budgets remain deeply in the red, consumer borrowing

remains high, and political leaders remain committed to free trade, lax immigration controls, and radical individualism that are making the majority of voters less secure and more anxious. Yet for fear of the political consequences, leaders cannot bring themselves to openly discuss alternatives, much less honestly confront middle class voters with the truth about the scale and length of the challenge that lies ahead.

It is in this context that I read the annual report of the Bank for International Settlements, which was issued last month. It gets less publicity than the IMF's economic updates, which is a shame because it tends to be much more clearly written. Here are some of this year's highlights:

“This time last year, there was both satisfaction and surprise at the continuing excellent performance of the global economy. Satisfaction, because buoyant growth and persistently low inflation, particularly in many emerging market economies, meant generally higher living standards and a significant reduction in poverty. Surprise, because a whole set of imbalances, which some thought had clear potential to eventually threaten that good performance, had still not done so. Many key macroeconomic variables, which had exhibited substantial and sustained deviations from historical norms, surprised by showing none of the typical signs of reverting to the mean. Record and rising household debt levels and a further increase in oil prices did not weigh on spending in the United States. Nor did record high house prices collapse, anywhere. China's investment boom was not interrupted. The easy flow of funds to borrowers of all types did not falter. And an unexpected further leap in what were already unprecedented external imbalances did not lead to disorder in exchange markets. One year later, the same sentiments could be invoked in even greater measure.,,”

“Everyone would hope that, by this time next year, we will be as satisfied with the performance of the global economy as we are today. The consensus forecast and those of the IMF and OECD point in this direction, reflecting the expectation that recent more balanced growth among the industrial countries will continue and that domestic demand will play an even larger role in emerging market economies. Further good news is that global inflation is forecast to remain generally subdued. Financial markets seem to have shared this optimism. Indeed, low levels of volatility, at least until very recently, even seemed to imply an unusual degree of certainty about such an outcome. The markets, moreover, seem to have viewed recent moves to tighten monetary policy in many of the advanced industrial countries as appropriate,

and likely to be growth-sustaining, rather than the opposite...Hopefully, the markets are right in their relatively optimistic assessment..."

"Given the complexity of the situation and the limits of our knowledge, it is extremely difficult to predict how [the coming year] might unfold. On the one hand, it is easy to argue, indeed it is the consensus view, that an orderly rebalancing is still the most likely outcome. By way of example, consider today's global current account imbalances. In principle, were the dollar to fall and increase foreign demand for US-made goods, US interest rates could rise to temper domestic demand just enough to avoid either rising unemployment or rising inflation. If, in turn, domestic demand elsewhere were growing just fast enough to replace that previously emanating from the United States, then global growth and inflation would not be affected either. On the other hand, it is also easy to identify forces that might make various processes of rebalancing less smooth. Some of these could imply the end will be a "bang" of market turbulence, others a "whimper" of slow growth for an extended period. Should the expected smooth adjustment not materialise, the alternative might well be a combination of the two..."

"There are, moreover, several market-specific reasons for concern about a degree of disorder should a process of adjustment begin. In the main industrial countries, there are many new participants in financial markets and many new financial products, of increasing complexity and opacity. Market liquidity in this environment has yet to be put to the test. The fact that carry trade speculation seems to have intensified in recent years also implies the potential for crowded trades that could, in the limit, lead to an interactive deterioration of market risk, credit risk and liquidity risk. We have in fact seen such interactions before... The upshot of all these considerations is that markets "priced to perfection" retain a significant potential for reversion to more normal levels. Moreover, given the interrelationships among all these markets, both domestic and international, there is a reasonable likelihood that if one market were to come under significant stress, it would spill over to others..."

"While many would doubtless dispute the likelihood of a sudden market "bang", the possibility also remains of a real side "whimper". That is, the various imbalances referred to above might well work themselves off gradually, but in a way that weighed heavily on global spending over a long period. Not least is the potential for record low household saving ratios to rebound in many countries, particularly in the United States. This could be a spontaneous precautionary response to higher debt levels, or to fears among baby boomers that earlier

pension commitments, both private and public, were less likely to be fully honoured. Alternatively, it could be a reaction to rising interest rates, market stress and uncertainties about future asset values. The fact that house prices have risen to such high levels in so many countries, and that this “wealth” effect does seem to have encouraged more spending, increases the likelihood of such an outcome. The reality is that, for a country as a whole, the wealth associated with house price increases is in very large part illusory. Being a relative price shift, its benefits to gainers are largely offset by the costs to losers. When the losers finally begin to adjust in response, it will generate significant economic headwinds. Other kinds of imbalances have the potential for similar mischief. In China, the principal concern must be that misallocated capital will eventually manifest itself in falling profits, and that this will feed back on the banking system, the fiscal authorities and the prospects for growth more generally. After a long period of credit-fuelled expansion, this would be the classic denouement. Indeed, this was very much the path followed earlier by Japan. Moreover, such an outturn might have even more severe effects on the industrial countries than is currently thought. In such circumstances, China’s already formidable and fast-growing manufacturing potential would surely be directed still more towards export markets. Were this to occur, just at the time that other countries were retrenching, the resulting interactions – economic, political and social – would present a great challenge for both the public and private sectors.”

This year’s BIS annual report is not an uplifting read. However, I believe it is as comprehensive and honest a picture of the current state of the world economy as one can find today. With that in mind, let’s move on to the current status of our early warning indicators:

Indicator	Dangerous Trend	Recent Observations
Real Return Bond Yields	Declining (lack of investment relative to savings)	Rising, though from quite low levels.
Yield on Nominal Return Ten Year U.S. Treasury Bond	Rising (increases probability of rising mortgage rates, weakening housing markets, consumer credit problems and economic recession)	Rising
Oil Prices	Historically high (Since oil	Highest in years.

Indicator	Dangerous Trend	Recent Observations
	price functions as a tax on consumers, higher prices raise probability of economic slowdown)	
U.S. /Euro Exchange Rate	Weakening (should lead to higher U.S. interest rates, and economic slowdown)	Down 8.0% since 31Dec05
Domestic Private Demand (consumption and investment) Growth in Japan and Eurozone	Weakening (world growth remains overdependent on U.S. consumer spending)	Rising in Japan, some indicators of increase in Eurozone
Private Consumption Spending in China	No Increase (world remains overdependent on U.S. consumers; danger of overinvestment and deflationary pressure in many industries)	While acknowledged as a priority by Chinese leaders, no progress yet.
Political Instability and Increased Repression in China	Increase signifies higher probability of sharp economic slowdown in China and/or higher global tensions	Seems to have calmed somewhat since last year. No headline incidents of late.
Iranian Rhetoric and Actions on Nuclear Issue	Aggressive rhetoric and actions raise probability of dangerously destabilizing military clash between Iran and West.	Iran threatens to use oil as a weapon in nuclear dispute, However, Khamenei appointed new body so supervise foreign policy, which might moderate Ahmadinejad's actions.
Policy Solutions Gaining Popularity with American Middle Class	Protectionist trade measures and punitive taxes increase likelihood of a longer and deeper economic slowdown	Anti China rhetoric has cooled, as anti-immigratin rhetoric took its place. However, underlying forces are still supportive of protectionist trade measures.
Human-to-Human Transmission of H5N1 Virus, and Associated Mortality Rate	Easier human-to-human transmission without a significant decline in the current mortality rate	Evidence in Indonesia of increased transmission rates, with high mortality rate especially among young people. However, transmission rates have not yet risen to pandemic levels.

As you can see, we don't see many signs that the global economic situation is becoming less fragile, or that the probability of a sharp downturn has declined. Like the BIS, we are somewhat surprised it hasn't happened yet. On the other hand, we also recognize that a surprising resiliency seems to be a signature characteristic of all complex adaptive systems. Still, we can't see how this "false calm" in the world economy can last much longer.

The spike in volatility last month, following the sell-off in some emerging, high yield, and commodity markets in May suggests that a lot of professional investors are also getting nervous. However, we suspect that their compensation incentives – whether they are linked to an absolute return, a return relative to a peer group, or a return relative to a benchmark – are keeping them invested in risky assets longer than their guts tell them is sensible. If and when a significant change starts to gain momentum, it will most likely begin, once again, with some combination of a rise in the VIX, falls in emerging markets, high yield bonds, and commodities (though the latter is complicated by the potential for political factors – read Iran or Venezuela – to keep oil prices high). At this point, we will be looking for any news about problems in any derivative market or hedge fund, or signs of disappearing liquidity in other markets. These are triggers that could easily accelerate the development of a crisis. The next logical step would be falling real return and government bond yields around the world, as money moves into safer assets. An interesting indicator at this point will be the U.S. equity and property markets. If a serious change is underway, values in these areas should fall faster than those in the U.K. and Europe, the dollar should fall versus the Swiss Franc, Euro and Pound, and perhaps the Canadian and Australian dollars too, and (from a U.S. dollar investor's perspective) foreign currency bond prices should rise and their local currency yields should fall (but returns, in dollar terms, may rise). At this point, gold should be rising and we would also expect to see rising prices for timber assets (PCL and RYN).

Product and Strategy Notes

A Depressing Dalbar Study

A new study from Dalbar Inc. shows that over the 20 years ended in 2005, the average investor earned an average annual return of only 3.9%, compared to a return of 11.9% on the S&P 500. Why the difference? The average investor had a very bad habit of buying high and selling low, and doing so frequently, which drove up transaction costs. Dalbar makes a critical point: the returns investors realize are as much due to their own behavior as to the performance of the market. And, we would add, the extent to which they have diversified their portfolio. Keep that in mind the next time somebody tries to sell you an investment “that can’t miss!” And then read the next item.

More on 401(k) Fund Choice

In a previous paper, “The Adequacy of Investment Choices Offered by 401(k) Plans”, Elton, Gruber and Blake found that many of these plans offered too few asset class choices to their participants. The three authors have just published a new paper examining the quality of plan administrators’ fund choices within those asset classes that are offered. The authors find that, “on average [plan administrators] select funds that underperform passive portfolios with the same risk.” However, they do manage to “outperform randomly selected funds from the same category.” That being said, “plan administrators [also] show less skill in replacing or adding funds. Managers add funds that have performed well in the past and drop funds that have performed poorly...The funds they add are in categories that have performed well in the past relative to other categories (hot sectors). However, after the plans make a change, the preponderance of evidence is that deleted funds did better than added funds, although the differences are not statistically significant.”

The authors also analyzed how plan participants allocated their money between the funds they were offered. The authors found that “the sum of [participants’] transfers and contributions was almost exactly equal to the impact of returns in determining the change in participant weights.” This confirms Dalbar’s findings.

Residential Property: Is a Crash on the Horizon?

Two new studies from respected sources reach a mixed conclusion about this critical question. In “Are House Prices Nearing a Peak?”, Paul van den Noord from the OECD concludes his study of multiple housing market as follows: “An increase in interest rates by about one to two percentage points would result in probabilities of a peak nearing 50% or more in the United States, France, Denmark, Ireland, New Zealand, Spain and Sweden.” He also notes that, if such a sharp peak is reached, “the historical record suggests that subsequent drops in [housing] prices in real terms could be large and the process could be protracted.” On the other hand, he also notes that thus far the U.K. and Australia have managed to cool their respective housing markets without, thus far, triggering a crash.

The second report comes from the Joint Center for Housing Studies at Harvard University. It forecasts a long period of stagnation in the United States housing market, but not a crash. The conclusion is based on the combination of overvaluation (house prices have grown six times faster than median income over the past five years) and high rates along with continued demand for housing (e.g., due to strong immigration) and the fact that about 75 percent of U.S. homes are financed with fixed rate mortgages. Time will tell which view is correct.

“Poor Man’s Alpha”

The IMF’s chief economist, Raghuram Rajan, last month offered a fascinating view on the forces driving recent swings in the price of relatively risky assets. At a conference in Spain, he noted that while active managers’ compensation is closely tied to their ability to generate alpha (i.e., returns above a comparable index benchmark) most of them found it very difficult to do this. He suggested that this led many of them to pursue the “poor man’s alpha” by simply taking on liquidity risks that others preferred not to hold (e.g., selling deeply out of the money derivatives, or buying low rated tranches of securitized debt structures). The success of this strategy depends on two conditions being met: the absence of low probability, very costly events, and the managers’ continued access to cheap funds to finance their leveraged long positions. As Central Banks around the world have raised interest rates, managers’ funding costs have risen, threatening their returns (and compensation) and leading some of them to

reduce their positions in riskier assets. As these have been sold into relatively illiquid markets (there aren't many people on the other side of the trade), the result has been big declines in some asset prices. Sounds right to us. And you've got to love that "poor man's alpha" line.

New Rydex Foreign Currency ETFs

We have frequently written (and again do so this month) about our view that the unwinding of the world's record current account imbalances will likely require both a depreciation of the dollar versus other major currencies, and a prolonged slowdown in U.S. economic growth. As always, our base case view has been that a portfolio that is well diversified across a range of asset classes should be able to perform reasonably well under this scenario, along with many others. In particular, for U.S. dollar based investors, we believe that non-U.S. dollar bonds should help support a portfolio's performance should the dollar weaken versus other major currencies. In our model portfolios, we have used either T.Rowe Price's (RPIBX) or PIMCO's (PFUIX) unhedged foreign bond funds to implement our allocations to this asset class.

However, as the U.S. dollar has fallen, other products have been introduced, targeting investors who want to profit from this development. Two quite expensive funds from Rydex (RYWBX) and ProFunds (FDPIX) are based on the New York Board of Trade Dollar Index. The underlying currency weights in this index are the Euro (58%), Yen (14%), UK Pound (12%), Canadian Dollar (9%), Swedish Krona (4%) and Swiss Franc (3%). In addition, over a year ago, Everbank launched a range of foreign currency CDs (see our April, 2005 issue). And last month, Rydex expanded its line of foreign currency ETFs, so that they now include not only the Euro (FXE), but also the UK Pound (FXB), Australian Dollar (FXA), Canadian Dollar (FXC), Swiss Franc (SXF), Swedish Kroner (FXS) and Mexican Peso (FXM). These funds have expense ratios of .40%, and earn interest based on the overnight rate in their respective currencies. This rate is less than the rate earned on the foreign bonds owed by RPIBX and PFUIX. Last but not least, Deutsche Bank has registered a long/short currency ETF with the Securities and Exchange Commission that, in theory (and assuming it is ever approved) will function like a currency hedge fund for retail investors (think of it as a Mount Lucas Management MLM Index type product, that only focuses on currencies).

The Rydex ETFs, and the Everbank CDs (which earn a somewhat higher rate of interest, because they lock up your funds for a period of time) create the opportunity for an

investor to build their own foreign currency index. With that in mind, we'll offer three perspectives on this issue. The table below shows the respective weights of eight currencies from two different perspectives: a market capitalization weighted index of sovereign bonds, and 2006 GDP weights at purchasing power parity, as estimated by the IMF. Collectively, the eight countries account for about 99% of the total sovereign index's market capitalization, but only 47% of GDP. In the table below, the weights have been rebased to add up to 100%.

	Euro	Yen	GBP	CAD	AUD	Switz	Swed	USA
Sov Bond Weigh	40%	28%	6%	2%	<1%	1%	1%	22%
GDP Weight	31%	13%	6%	4%	2%	1%	1%	42%

However, bond markets around the world differ widely in terms of the relative importance of sovereign (government) issues. The table below compares the different weighting of government (and government related), corporate and asset backed (e.g., mortgages and other securitized receivables) issues in five Lehman Brothers regional Aggregate Indexes:

	US	Eurozone	UK	AsiaPacific	Global
Government	38%	72%	64%	93%	64%
Corporate	19%	15%	30%	7%	16%
Asset Backed	43%	13%	6%	0%	20%

When you take all of its segments are taken into account, the U.S. bond market (based on Bank for International Settlements data) accounts for roughly half of the world bond market's total market capitalization. But that doesn't count bank loans. And as we all know, more and more of them are being securitized today, into collateralized loan obligations and other vehicles. The bottom line is that anybody's estimate of the "right" division of global bond market capitalization between currency regions is at best a rough guess.

More importantly, it may be irrelevant to the task at hand. As we have described (see "Investing in Debt Markets" on our home page), when it comes to bonds, market capitalization index weighting has some very strong arguments against it (e.g., giving the heaviest weight to the most profligate borrowers). On balance, we prefer two other approaches. The first is used by Goldman Sachs to construct its InvesTop Index. It is an equally weighted collection of

bonds that aims to cover a grid of credit ratings and maturities. However, that isn't relevant in the case of trying to construct a foreign index from using either the Rydex foreign currency ETFs or Everbank foreign currency CDs.

Hence we come back to GDP weighting, which, in this context, can be thought of as "relative capacity to generate value", which is then divided between holders of debt and equity issued by the currency zone in question. We admit it's an imperfect approach; however, it at least has some underlying logic to it. If you rebase the GDP weights to exclude the US and still add up to 100%, you end up with the following allocation:

	Euro	Yen	GBP	CAD	AUD	Switz	Swed
GDP Weight	53%	23%	11%	6%	4%	1%	2%

As you can see, these weightings are reasonably close to those used in the New York Board of Trade's Dollar Index. Unfortunately, this allocation presents two problems, one obvious and one subtle. The former is the absence of a Rydex ETF that provides exposure to the Yen. Since Japan's economy has historically had a relatively low correlation with the United States' (and many other countries), this is a serious omission. The more subtle issue is the relatively low weight given to the Swiss Franc. Both GDP and market capitalization weighting underestimate the important role the Swiss Franc plays in the global economy as a low risk asset. As a practical matter, we would therefore give it a higher weight in any index designed to generate high returns when the U.S. dollar declines.

2006-2007 Model Portfolios Update

Our model portfolios are constructed using a simulation optimization methodology. They assume that an investor understands the long-term compound real rate of return he or she needs to earn on his or her portfolio to achieve his or her long-term financial goals. We use SO to develop multi-period asset allocation solutions that are “robust”. They are intended to maximize the probability of achieving an investor’s compound annual return target under a wide range of possible future asset class return scenarios. More information about the SO methodology is available on our website. Using this approach, we produce model portfolios for six different compound annual real return targets: 7%, 6%, 5%, 4%, 3%, and 2%. We produce two sets of these portfolios: one assumes only investments in broad asset class index funds. These are our “all beta” portfolios. The second set of model portfolios includes equity market neutral (uncorrelated alpha) funds as a possible investment. These assume that an investor is primarily investing in index funds, but is willing to allocate up to ten percent of his or her portfolio to equity market neutral investments.

We use two benchmarks to measure the performance of our model portfolios. The first is cash, which we define as the yield on a one year government security purchased on the last trading day of the previous year. For 2006, our U.S. cash benchmark is 4.40% (in nominal terms). The second benchmark we use is a portfolio equally allocated between the ten asset classes we use (it does not include equity market neutral). This portfolio assumes that an investor believes it is not possible to forecast the risk or return of any asset class. While we disagree with that assumption, it is an intellectually honest benchmark for our model portfolios’ results.

The year-to-date nominal returns for all these model portfolios are shown in the tables on the following pages. Mutual and exchange traded funds that can be used to implement these model portfolios’ asset allocations are listed on our website.

Model Portfolios Year-to-Date Performance

<i>These portfolios seek to maximize the probability of achieving at least the target real return over twenty years, at the lowest possible risk.</i>			
	YTD 30Jun06	Weight	Weighted Return
	In US\$		In US\$
7% Target Real Return	<i>YTD Returns are Nominal</i>		
<i>Asset Classes</i>			
Real Return Bonds	-1.7%	0.0%	0.0%
U.S. Bonds	-0.9%	0.0%	0.0%
Non-U.S. Bonds	3.6%	10.0%	0.4%
Domestic Commercial Property	13.2%	0.0%	0.0%
Foreign Commercial Property	12.1%	5.0%	0.6%
Commodities	-0.8%	17.5%	-0.1%
Timber	-0.3%	2.5%	0.0%
U.S. Equity	3.3%	55.0%	1.8%
Foreign Equity (EAFE)	10.2%	5.0%	0.5%
Emerging Mkt. Equity	6.1%	5.0%	0.3%
Equity Market Neutral	4.3%	0.0%	0.0%
		100.0%	3.5%

	YTD 30Jun06	Weight	Weighted Return
	In US\$		In US\$
6% Target Real Return	<i>YTD Returns are Nominal</i>		
<i>Asset Classes</i>			
Real Return Bonds	-1.7%	2.5%	0.0%
U.S. Bonds	-0.9%	0.0%	0.0%
Non-U.S. Bonds	3.6%	10.0%	0.4%
Domestic Commercial Property	13.2%	0.0%	0.0%
Foreign Commercial Property	12.1%	0.0%	0.0%
Commodities	-0.8%	15.0%	-0.1%
Timber	-0.3%	5.0%	0.0%
U.S. Equity	3.3%	45.0%	1.5%
Foreign Equity (EAFE)	10.2%	15.0%	1.5%
Emerging Mkt. Equity	6.1%	7.5%	0.5%
Equity Market Neutral	4.3%	0.0%	0.0%
		100.0%	3.7%

	YTD 30Jun06	Weight	Weighted Return
	In US\$		In US\$
5% Target Real Return	<i>YTD Returns are Nominal</i>		
<i>Asset Classes</i>			
Real Return Bonds	-1.7%	2.5%	0.0%
U.S. Bonds	-0.9%	27.5%	-0.2%
Non-U.S. Bonds	3.6%	12.5%	0.5%
Domestic Commercial Property	13.2%	0.0%	0.0%
Foreign Commercial Property	12.1%	0.0%	0.0%
Commodities	-0.8%	15.0%	-0.1%
Timber	-0.3%	5.0%	0.0%
U.S. Equity	3.3%	17.5%	0.6%
Foreign Equity (EAFE)	10.2%	10.0%	1.0%
Emerging Mkt. Equity	6.1%	10.0%	0.6%
Equity Market Neutral	4.3%	0.0%	0.0%
		100.0%	2.2%

	YTD 30Jun06	Weight	Weighted Return
	In US\$		In US\$
4% Target Real Return	<i>YTD Returns are Nominal</i>		
<i>Asset Classes</i>			
Real Return Bonds	-1.7%	5.0%	-0.1%
U.S. Bonds	-0.9%	32.5%	-0.3%
Non-U.S. Bonds	3.6%	15.0%	0.5%
Domestic Commercial Property	13.2%	5.0%	0.7%
Foreign Commerical Property	12.1%	0.0%	0.0%
Commodities	-0.8%	10.0%	-0.1%
Timber	-0.3%	10.0%	0.0%
U.S. Equity	3.3%	0.0%	0.0%
Foreign Equity (EAFE)	10.2%	15.0%	1.5%
Emerging Mkt. Equity	6.1%	7.5%	0.5%
Equity Market Neutral	4.3%	0.0%	0.0%
		100.0%	2.7%

	YTD 30Jun06	Weight	Weighted Return
	In US\$		In US\$
3% Target Real Return	<i>YTD Returns are Nominal</i>		
<i>Asset Classes</i>			
Real Return Bonds	-1.7%	12.5%	-0.2%
U.S. Bonds	-0.9%	42.5%	-0.4%
Non-U.S. Bonds	3.6%	10.0%	0.4%
Domestic Commercial Property	13.2%	0.0%	0.0%
Foreign Commercial Property	12.1%	0.0%	0.0%
Commodities	-0.8%	12.5%	-0.1%
Timber	-0.3%	0.0%	0.0%
U.S. Equity	3.3%	5.0%	0.2%
Foreign Equity (EAFE)	10.2%	10.0%	1.0%
Emerging Mkt. Equity	6.1%	7.5%	0.5%
Equity Market Neutral	4.3%	0.0%	0.0%
		100.0%	1.3%

	YTD 30Jun06	Weight	Weighted Return
	In US\$		In US\$
2% Target Real Return	<i>YTD Returns are Nominal</i>		
<i>Asset Classes</i>			
Real Return Bonds	-1.7%	22.5%	-0.4%
U.S. Bonds	-0.9%	32.5%	-0.3%
Non-U.S. Bonds	3.6%	10.0%	0.4%
Domestic Commercial Property	13.2%	0.0%	0.0%
Foreign Commercial Property	12.1%	0.0%	0.0%
Commodities	-0.8%	7.5%	-0.1%
Timber	-0.3%	5.0%	0.0%
U.S. Equity	3.3%	7.5%	0.2%
Foreign Equity (EAFE)	10.2%	10.0%	1.0%
Emerging Mkt. Equity	6.1%	5.0%	0.3%
Equity Market Neutral	4.3%	0.0%	0.0%
		100.0%	1.2%

	YTD 30Jun06	Weight	Weighted Return
	In US\$		In US\$
Equally Weighted Portfolio	<i>YTD Returns are Nominal</i>		
<i>Asset Classes</i>			
Real Return Bonds	-1.7%	10.0%	-0.2%
U.S. Bonds	-0.9%	10.0%	-0.1%
Non-U.S. Bonds	3.6%	10.0%	0.4%
Domestic Commercial Property	13.2%	10.0%	1.3%
Foreign Commercial Property	12.1%	10.0%	1.2%
Commodities	-0.8%	10.0%	-0.1%
Timber	-0.3%	10.0%	0.0%
U.S. Equity	3.3%	10.0%	0.3%
Foreign Equity (EAFE)	10.2%	10.0%	1.0%
Emerging Mkt. Equity	6.1%	10.0%	0.6%
		100.0%	4.5%

<i>These portfolios seek to maximize the probability of achieving at least the target real return over twenty years, at the lowest possible risk.</i>		<i>Unlike the other target return portfolios, these allow investment in uncorrelated alpha (equity market neutral) funds.</i>	
	YTD 30Jun06	Weight	Weighted Return
	In US\$		In US\$
7% Target Real Return	<i>YTD Returns are Nominal</i>		
<i>Asset Classes</i>			
Real Return Bonds	-1.7%	0.0%	0.0%
U.S. Bonds	-0.9%	0.0%	0.0%
Non-U.S. Bonds	3.6%	0.0%	0.0%
Domestic Commercial Property	13.2%	0.0%	0.0%
Foreign Commercial Property	12.1%	7.5%	0.9%
Commodities	-0.8%	12.5%	-0.1%
Timber	-0.3%	7.5%	0.0%
U.S. Equity	3.3%	52.5%	1.7%
Foreign Equity (EAFE)	10.2%	5.0%	0.5%
Emerging Mkt. Equity	6.1%	10.0%	0.6%
Equity Market Neutral	4.3%	5.0%	0.2%
		100.0%	3.9%

	YTD 30Jun06	Weight	Weighted Return
	In US\$		In US\$
6% Target Real Return	<i>YTD Returns are Nominal</i>		
<i>Asset Classes</i>			
Real Return Bonds	-1.7%	0.0%	0.0%
U.S. Bonds	-0.9%	5.0%	0.0%
Non-U.S. Bonds	3.6%	7.5%	0.3%
Domestic Commercial Property	13.2%	0.0%	0.0%
Foreign Commercial Property	12.1%	0.0%	0.0%
Commodities	-0.8%	10.0%	-0.1%
Timber	-0.3%	10.0%	0.0%
U.S. Equity	3.3%	37.5%	1.2%
Foreign Equity (EAFE)	10.2%	15.0%	1.5%
Emerging Mkt. Equity	6.1%	10.0%	0.6%
Equity Market Neutral	4.3%	5.0%	0.2%
		100.0%	3.7%

	YTD 30Jun06	Weight	Weighted Return
	In US\$		In US\$
5% Target Real Return	<i>YTD Returns are Nominal</i>		
<i>Asset Classes</i>			
Real Return Bonds	-1.7%	2.5%	0.0%
U.S. Bonds	-0.9%	22.5%	-0.2%
Non-U.S. Bonds	3.6%	10.0%	0.4%
Domestic Commercial Property	13.2%	2.5%	0.3%
Foreign Commercial Property	12.1%	0.0%	0.0%
Commodities	-0.8%	15.0%	-0.1%
Timber	-0.3%	5.0%	0.0%
U.S. Equity	3.3%	12.5%	0.4%
Foreign Equity (EAFE)	10.2%	10.0%	1.0%
Emerging Mkt. Equity	6.1%	10.0%	0.6%
Equity Market Neutral	4.3%	10.0%	0.4%
		100.0%	2.8%

	YTD 30Jun06	Weight	Weighted Return
	In US\$		In US\$
4% Target Real Return	<i>YTD Returns are Nominal</i>		
<i>Asset Classes</i>			
Real Return Bonds	-1.7%	12.5%	-0.2%
U.S. Bonds	-0.9%	27.5%	-0.2%
Non-U.S. Bonds	3.6%	0.0%	0.0%
Domestic Commercial Property	13.2%	0.0%	0.0%
Foreign Commercial Property	12.1%	2.5%	0.3%
Commodities	-0.8%	12.5%	-0.1%
Timber	-0.3%	7.5%	0.0%
U.S. Equity	3.3%	5.0%	0.2%
Foreign Equity (EAFE)	10.2%	15.0%	1.5%
Emerging Mkt. Equity	6.1%	7.5%	0.5%
Equity Market Neutral	4.3%	10.0%	0.4%
		100.0%	2.3%

	YTD 30Jun06	Weight	Weighted Return
	In US\$		In US\$
3% Target Real Return	<i>YTD Returns are Nominal</i>		
<i>Asset Classes</i>			
Real Return Bonds	-1.7%	12.5%	-0.2%
U.S. Bonds	-0.9%	32.5%	-0.3%
Non-U.S. Bonds	3.6%	12.5%	0.5%
Domestic Commercial Property	13.2%	0.0%	0.0%
Foreign Commercial Property	12.1%	0.0%	0.0%
Commodities	-0.8%	10.0%	-0.1%
Timber	-0.3%	5.0%	0.0%
U.S. Equity	3.3%	5.0%	0.2%
Foreign Equity (EAFE)	10.2%	10.0%	1.0%
Emerging Mkt. Equity	6.1%	5.0%	0.3%
Equity Market Neutral	4.3%	7.5%	0.3%
		100.0%	1.7%

	YTD 30Jun06	Weight	Weighted Return
	In US\$		In US\$
2% Target Real Return	<i>YTD Returns are Nominal</i>		
<i>Asset Classes</i>			
Real Return Bonds	-1.7%	17.5%	-0.3%
U.S. Bonds	-0.9%	35.0%	-0.3%
Non-U.S. Bonds	3.6%	12.5%	0.5%
Domestic Commercial Property	13.2%	0.0%	0.0%
Foreign Commercial Property	12.1%	0.0%	0.0%
Commodities	-0.8%	7.5%	-0.1%
Timber	-0.3%	5.0%	0.0%
U.S. Equity	3.3%	5.0%	0.2%
Foreign Equity (EAFE)	10.2%	5.0%	0.5%
Emerging Mkt. Equity	6.1%	5.0%	0.3%
Equity Market Neutral	4.3%	7.5%	0.3%
		100.0%	1.1%