The Index Investor

Invest Wisely…Get an Impartial Second Opinion.

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This Month's Issue: Key Points

The exciting events of August caused an upset in our editorial schedule, as we juggled our content plans with the market moves. The net result is that this month's edition is a double issue. Our first article looks at the advantages and disadvantages of treating art as an asset class. We conclude that while it may be nice to have on your wall, it probably isn't good to have in your portfolio. Our second article returns to a topic we've covered before, the pros and cons of investing in private equity. We review Jeremy Grantham's trenchant critique of these investments, and warning about what lies ahead for many of them. Our third feature article in this double issue looks at a critical assumption in all asset allocation analyses that has received much less research attention than it deserves: the future level of the real risk free rate of interest. We conclude that it will probably remain low or decline further. However,

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there are some critical uncertainties in this forecast, and it is likely that we will see both low rate, low volatility and high rate, high volatility regimes in the future. Our fourth feature article is an extended look at the recent excitement in the world's financial markets, and how different asset classes were affected. While we are still pessimistic about the conditions that lie ahead, we believe our readers broadly understand the major forces at work, and how investors should position themselves to manage the risks and opportunities they may create.

This month's product and strategy notes cover a new analysis of technical trading rules' efficacy, developments in carbon emissions investing, new research into the scale diseconomies that beset successful active managers, some interesting (for various reasons) new product launches, and new research into pension plan design and retirement savings adequacy.

This Month's Letters to the Editor

I am a new subscriber, and am trying to get an understanding of which indices are currently overvalued and which are undervalued. You have a table showing your subjective views on this. Surely, with all this data it is possible to do better than a subjective view? I was expecting somewhere statistics on the key indices from which it is possible to look at long term trends and form an opinion with some objectivity. Have I missed something?

Unfortunately, deciding whether an index is over, under or fairly valued will always be a subjective judgment. To be sure, in our Market Valuation Update Section, each month we provide our readers with a lot of analysis to help them make these judgments with respect to how an index compares to its fundamental value. Yet as we repeatedly note, our analysis unavoidably suffers from the same limitations as all others like it: our fundamental valuation model may be incorrectly specified, the values we place on key variables are subject to estimation error, and, like all complex adaptive systems, relationships in the underlying economy are subject to significant changes that we may not anticipate (e.g., as many quantitative investment managers discovered last month when it came to their assumptions about liquidity). As for trends and statistics about key indices, these are readily available from sources like Yahoo, Bloomberg, and Global Financial Data, so we don't provide them on our site.

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I recently read your article on not sleeping well at night, and Jeremy Grantham's predictions regarding future returns. When the sub-prime crisis hit, I figured that was the beginning of the end, so I decided to hold off investing a sum of money we recently received. I am now out of the market and don't know what to do. I know how futile market timing can be. I am at a loss; what should I do?

We distinguish between four different types of "market timing", based on whether their objective is higher returns or less risk, and whether they are carried out systematically or episodically. The type of market timing that gets a bad name is episodic shifts in asset allocation intended to boost returns. Success in this area requires a degree of forecasting skill and consistency that is beyond the reach of most people. Granted, there are a few global macro managers who appear to have those skills; however, most of us don't. In contrast, we are less negative on the three other types of market timing. For example, in pursuit of slightly higher returns over time, one might systematically (i.e., automatically) rebalance one's portfolio so that you end up slightly overweight in the worst performing asset class, and slightly underweight in the best performing asset class. If you believe that, over time, there is a pattern of markets tending to overreact and then revert back towards their average long-term returns, this systematic approach should raise your long-term compounded rate of return. At the same time, automatically rebalancing your portfolio (e.g., based on time or when one or more asset classes exceeds some threshold weight) is a systematic approach to risk management that prevents you from taking on more than you originally intended. Last but not least is an episodic decision to rebalance one's portfolio with the objective of reducing exposure to so-called "tail events" or extreme downside moves. These events generally occur after an asset class has become significantly overvalued, based on some (admittedly subjective) valuation model. These are probably the most difficult decisions to make, because you are almost guaranteed to feel regret as an asset class continues to deliver impressive positive returns after you have reduced or eliminated your position. They are even more difficult to make if your benchmark is some measure of market performance, or even worse, the outstanding investing track record your Uncle Charlie likes to brag about every December. Yet from a strictly mathematical point of view, these decisions are critical, as they can help an investor to avoid severe losses that can significantly reduce a portfolio's long term compound real return, and therefore the probability of achieving a long term funding goal without having to reduce consumption and increase savings. On this issue, there are no easy answers.

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Nor are there any easy answers about when to get back into an asset class after you have sold out of your position. While valuation models can provide guidance, the timing of the reinvestment decision is inescapably subjective and fraught with regret risk. We wish we had a glib and easy answer to the question you asked. Unfortunately, we don't.

In your Asset Class Valuation Update section, you write that, "according to theory, the currency with the relatively higher interest rates should depreciate versus currencies with lower interest rates." How so? My research shows the opposite?

The question you ask lies at the heart of many currency overlay strategies, and the so-called "carry trade" strategy employed by many hedge funds in recent years. Clearly, the theory makes sense. If, for example, the U.K. had higher interest rates than the United States, and if the exchange rate were guaranteed not to change, then (beyond a certain level of transaction costs), selling U.S. dollars for U.K. pounds, investing them for a year in the U.K., then selling the pounds for dollars would represent a free lunch. In an efficient market, the extra amount of money that one could earn as a result of the interest rate differential should be offset by a depreciation of the U.K. currency versus the dollar, so that it takes more pounds to buy a dollar when the U.K. investment matures than when it was originally made (technically, this is called the International Fisher Effect). However, as we noted in our recent article on the carry trade, it sometimes doesn't hold in practice, or at least doesn't take effect as fast as theory predicts (because the foreign exchange markets seem to have a lot of investors whose trading is motivated by something other than value maximization). A lot of money has been made in recent years by hedge funds who went long the high interest currency (be it New Zealand Dollars, Turkish Lira or Icelandic Krona), based on the belief that it would not depreciate as theory predicts, or at least not over the time horizon of their strategy. So, while we believe that we are on solid theoretical ground when predicting that differences in ten year government bond yields should give a good indication of long-term exchange rate changes (based on the information available today), we agree that events in the short term may well turn out differently.

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Global Asset Class Returns

YTD 31Aug07	In USD	In AUD	In CAD	In EURO	In JPY	In GBP	In CHF	In INR
Asset Held								
US Bonds	2.97%	-0.07%	-7.25%	-0.30%	0.30%	2.23%	2.09%	-4.95%
US Prop	-8.00%	-11.04%	-18.22%	-11.27%	-10.67%	-8.74%	-8.88%	-15.92%
US Equity	5.31%	2.27%	-4.91%	2.04%	2.64%	4.57%	4.43%	-2.61%
AUS Bonds	3.32%	0.28%	-6.90%	0.05%	0.66%	2.58%	2.45%	-4.60%
AUS Prop	4.08%	1.04%	-6.14%	0.81%	1.42%	3.34%	3.21%	-3.84%
AUS Equity	18.89%	15.86%	8.67%	15.62%	16.23%	18.15%	18.02%	10.98%
CAN Bonds	7.11%	4.07%	-3.12%	3.84%	4.44%	6.36%	6.23%	-0.81%
CAN Prop	10.87%	7.83%	0.65%	7.60%	8.20%	10.12%	9.99%	2.95%
CAN Equity	20.42%	17.38%	10.20%	17.15%	17.75%	19.68%	19.54%	12.50%
Euro Bonds	0.43%	-2.61%	-9.79%	-2.84%	-2.24%	-0.31%	-0.45%	-7.49%
Euro Prop.	-10.95%	-13.99%	-21.17%	-14.22%	-13.62%	-11.70%	-11.83%	-18.87%
Euro Equity	10.56%	7.52%	0.33%	7.29%	7.89%	9.81%	9.68%	2.64%
Japan Bnds	3.26%	0.22%	-6.96%	-0.01%	0.59%	2.51%	2.38%	-4.66%
Japan Prop	3.43%	0.39%	-6.79%	0.16%	0.76%	2.69%	2.55%	-4.49%
Japan Eqty	-0.99%	-4.02%	-11.21%	-4.26%	-3.65%	-1.73%	-1.86%	-8.90%
UK Bonds	-1.61%	-4.65%	-11.83%	-4.88%	-4.28%	-2.35%	-2.49%	-9.53%
UK Prop.	-18.13%	-21.17%	-28.35%	-21.40%	-20.80%	-18.87%	-19.01%	-26.05%
UK Equity	5.68%	2.64%	-4.54%	2.41%	3.02%	4.94%	4.81%	-2.24%
World Bnds	3.25%	0.21%	-6.98%	-0.02%	0.58%	2.50%	2.37%	-4.67%
World Prop.	-2.37%	-5.41%	-12.59%	-5.64%	-5.04%	-3.11%	-3.25%	-10.29%
World Eqty	7.64%	4.60%	-2.59%	4.37%	4.97%	6.89%	6.76%	-0.28%
Commod	1.80%	-1.24%	-8.42%	-1.47%	-0.87%	1.05%	0.92%	-6.12%
Timber	7.79%	4.75%	-2.43%	4.52%	5.12%	7.05%	6.91%	-0.13%
EqMktNtrl	2.86%	-0.18%	-7.36%	-0.41%	0.19%	2.11%	1.98%	-5.06%
Volatility	102.25%	99.21%	92.03%	98.98%	99.58%	101.51%	101.37%	94.33%
Currency								
AUD	3.04%	0.00%	-7.18%	-0.23%	0.37%	2.29%	2.16%	-4.88%
CAD	10.22%	7.18%	0.00%	6.95%	7.56%	9.48%	9.35%	2.30%
EUR	3.27%	0.23%	-6.95%	0.00%	0.60%	2.53%	2.39%	-4.65%
JPY	2.67%	-0.37%	-7.56%	-0.60%	0.00%	1.92%	1.79%	-5.25%
GBP	0.74%	-2.29%	-9.48%	-2.53%	-1.92%	0.00%	-0.13%	-7.17%
USD	0.00%	-3.04%	-10.22%	-3.27%	-2.67%	-0.74%	-0.88%	-7.92%
CHF	0.88%	-2.16%	-9.35%	-2.39%	-1.79%	0.13%	0.00%	-7.04%
INR	7.92%	4.88%	-2.30%	4.65%	5.25%	7.17%	7.04%	0.00%

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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. For this variable, we use two different values, 1% or 2%. Third, we also use two different values for the equity risk premium required by investors: 2.5% and 4.0%. Different combinations of all these variables yield high and low scenarios for both the future returns the market is expected to supply (dividend yield plus growth rate), and the future returns investors will demand (real bond yield plus equity risk premium). 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 (Current Dividend Yield x 100) x (1+ Forecast Productivity Growth) divided by (Current Yield on Real Return Bonds + Equity Risk Premium - 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. In our view, the greater the number of scenarios that point to overvaluation or undervaluation, the greater the probability that is likely to be the case.

Equity Market Valuation Analysis at 31 August 07

Australia	**Low Demanded Return**	**High Demanded Return**
High Supplied Return	74%	110%
Low Supplied Return	112%	154%

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Canada	Low Demanded Return	High Demanded Return
High Supplied Return	118%	185%
Low Supplied Return	213%	300%

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Eurozone	Low Demanded Return	High Demanded Return
High Supplied Return	81%	124%
Low Supplied Return	130%	181%

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Japan	Low Demanded Return	High Demanded Return
High Supplied Return	98%	184%
Low Supplied Return	222%	346%

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United Kingdom	Low Demanded Return	High Demanded Return
High Supplied Return	53%	95%
Low Supplied Return	95%	145%

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United States	Low Demanded Return	High Demanded Return
High Supplied Return	129%	196%
Low Supplied Return	227%	315%

Switzerland	Low Demanded Return	High Demanded Return
High Supplied Return	103%	156%
Low Supplied Return	170%	317%

India	Low Demanded Return	High Demanded Return
High Supplied Return	106%	197%
Low Supplied Return	245%	379%

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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:

Bond Market Analysis as of 31Aug07

	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	2.59%	2.96%	5.55%	5.92%	0.37%	-3.47%
Canada	2.16%	2.40%	4.56%	4.42%	-0.14%	1.33%
Eurozone	2.30%	2.37%	4.67%	4.25%	-0.42%	4.08%
Japan	1.20%	0.77%	1.97%	1.61%	-0.36%	3.55%
UK	1.39%	3.17%	4.56%	5.04%	0.48%	-4.50%
USA	2.40%	2.93%	5.33%	4.53%	-0.80%	7.95%
Switz.	2.45%	2.03%	4.48%	3.05%	-1.43%	14.78%
India	2.25%	7.57%	9.82%	7.95%	-1.87%	18.74%

*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% in the United States. 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

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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 (see the article on this subject elsewhere in this issue). Lower risk aversion may also be associated with rising danger of overvaluations occurring in other asset markets. The real rate formula is [Time Discount Rate + ((1/Risk Aversion Factor) x MFP Growth)].

Real Interest Rate Analysis at 31Aug07

Real Rate Analysis	AUD	CAD	EUR	JPY	GBP	USD
Risk Aversion Factor	4.0	4.0	4.0	5.5	5.5	3.5
Time Discount Rate	1.75%	1.75%	1.75%	1.00%	1.00%	2.0%
MFP Growth	1.60%	1.20%	1.40%	0.60%	1.40%	1.40%
Theoretical Real Rate	2.15%	2.05%	2.10%	1.11%	1.25%	2.40%
Real Rate	2.59%	2.16%	2.30%	1.20%	1.39%	2.40%

Our bond market 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

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expected future inflation is lower than historical inflation, required returns will be lower. All else being equal, this would reduce any estimated overvaluation or increase any estimated undervaluation. For example, 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 (e.g., between a low volatility, relatively high return regime, and a high volatility, lower return regime). 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 credit 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%. This could be read as an indication of investor's higher concern with respect to the systematic risk implications of these crises (i.e., their potential to shift the financial markets into the low return, high volatility regime), and lesser concern with respect to their impact on the overall pricing of credit risk.

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 (i.e., based on historical data, 95% of the time you would expect the current spreads to be within two standard deviations of the long term average).

	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%

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At 31 August 2007, the AAA minus 10 year Treasury spread was 1.23%. This is above the long-term average compensation for bearing liquidity and jump risk (assuming our model is correct), and reflects a clear market reaction to the increasingly severe liquidity problems that roiled the markets during August.

At the end of the month, the BBB minus AAA spread was .82%. This is still below the long-term average compensation for bearing credit risk, in spite of the tumultuous developments in the credit markets over the past month. We still believe that it is more likely that credit risk is underestimated rather than overestimated today, and that corporate bonds are overvalued rather than undervalued.

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, particularly in the short term. 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. According to theory, the currency with the relatively higher interest rates should depreciate versus the currency with the lower interest rates. Of course, in the short term this often doesn't happen, which is the premise of the popular hedge fund "carry trade" strategy of borrowing in low interest rate currencies, investing in high interest rate currencies, and, essentially, betting that the change in exchange rates over the holding period for the trade won't eliminate the potential profit. Because (as noted in our June 2007 issue) there are some important players in the foreign exchange markets who are not profit maximizers, carry trades are often profitable, at least over short time horizons. Our expected medium to long-term changes in exchange rates are summarized in the following table:

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Annual Exchange Rate Changes Implied by Bond Market Yields on 31Aug07

	To AUD	To CAD	To EUR	To JPY	To GBP	To USD	To CHF	To INR
From								
AUD	0.00%	-1.50%	-1.67%	-4.31%	-0.88%	-1.39%	-2.87%	2.03%
CAD	1.50%	0.00%	-0.17%	-2.81%	0.62%	0.11%	-1.37%	3.53%
EUR	1.67%	0.17%	0.00%	-2.64%	0.79%	0.28%	-1.20%	3.70%
JPY	4.31%	2.81%	2.64%	0.00%	3.43%	2.92%	1.44%	6.34%
GBP	0.88%	-0.62%	-0.79%	-3.43%	0.00%	-0.51%	-1.99%	2.91%
USD	1.39%	-0.11%	-0.28%	-2.92%	0.51%	0.00%	-1.48%	3.42%
CHF	2.87%	1.37%	1.20%	-1.44%	1.99%	1.48%	0.00%	4.90%
INR	0.00%	-1.50%	-1.67%	-4.31%	-0.88%	-1.39%	-2.87%	2.03%

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 expect supply of returns equals the expected returns demanded by investors), and "backed out" the implied future real growth rates for dividends (which over time should correlated with the real change in rental income) 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 an investor for the risk of securitized commercial property as an asset class. The following table shows the results of this analysis:

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Commercial Property Securities Analysis as of 31Aug07

Country	Real Bond Yield	Plus Commercial Property Risk Premium	Less Dividend Yield on Commercial Property Securities	Equals Implied Rate of Future Real Dividend Growth
Australia	2.59%	2.50%	5.8%	-0.7%
Canada	2.16%	2.50%	4.3%	0.3%
Eurozone	2.30%	2.50%	2.9%	1.9%
Japan	1.20%	2.50%	1.5%	2.2%
Switzerland	2.45%	2.50%	3.9%	1.0%
United Kingdom	1.39%	2.50%	2.5%	1.4%
United States	2.40%	2.50%	4.6%	0.4%

If you think the implied real growth estimates in the last column are too high relative to your expectation for the future real growth in average rents, this implies commercial property securities are overvalued today. On the other hand, if you think the implied growth rate is too low, that implies undervaluation. Since we expect a significant slowdown in the global economy over the next few years, we are inclined to view most of these implied real growth assumptions as too optimistic (Australia and perhaps Canada excepted), and therefore to believe that the balance of business cycle and valuation evidence suggests that commercial property securities in many markets are probably overvalued today.

To estimate the likely direction of short term commodity futures price changes, we compare the current price to the historical distribution of futures index prices. Between 1991 and 2005 period, the Dow Jones AIG Commodities Index (DJAIG) had an average value of 107.6, with a standard deviation of 21.9. The 31 August 2007 closing value of 165.566 was more than two and one half standard deviations above the average (assuming the value of the index is normally distributed around its historical average, a value greater than three standard deviations away from that average should occur less than 1% of the time). Given this, the probability of a near term decline in the spot price of the DJAIG still seems much higher than the probability of an increase. At any given point in time, the current price of a commodity futures contract should equal the expected future spot price less some premium (i.e., expected return) the buyer of the future expects to receive for bearing the risk that this forecasted future

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spot price will be inaccurate. However, the actual return realized by the buyer of the futures contract can turn out to be quite different from the expected return. When it occurs, this difference will be due to unexpected changes in the spot price of the contract that occur after the date on which the futures contract was purchased but before it is closed out. If the unexpected change in the spot price is positive, the buyer of the futures contract (i.e., the investor) will receive a higher than expected return; if the unexpected price change is negative, the buyer's return will be lower than expected. In a perfectly efficient market, these unexpected price changes should be unpredictable, and over time net out to zero. On the other hand, if the futures market is less than perfectly efficient – if, for example, investors' emotions cause prices to sometimes diverge from their rational equilibrium values – then it is possible for futures contracts to be over or undervalued.

Our approach to assessing the current valuation of timber is based on two publicly traded timber REITS: Plum Creek (PCL) and Rayonier (RYN). As in the case of equities, we compare the return these are expected to supply (defined as their current dividend yield plus the expected growth rate of those dividends) to the equilibrium return investors should rationally demand for holding timber assets (defined as the current yield on real return bonds plus an appropriate risk premium for this asset class). As is the case with equities, two of these variables are published: the dividend yields on the timber REITS and the yield on real return bonds. The other two variables have to be estimated. A number of factors contribute to the expected future growth rate of timber REIT dividends. These are listed in the following table, along with the assumptions we make about their future values:

Growth Driver	**Assumption**
Biological growth of trees	While this varies according to the maturity a given timber property, we assume 6% as the long term average.
Change in prices of timber and land on which the trees are growing	We assume that over the long term they just keep pace with inflation. Hence, their contribution to the real growth rate is zero.
Diversification across countries	As in the case of commodities, that an investor in an internationally diversified portfolio of timber assets should earn a diversification return, similar to the one earned by investors in a well diversified

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Growth Driver	**Assumption**
	portfolio of commodity futures contracts. In the interest of conservatism, we assume that in the case of timber this equals zero.
Carbon credits	In the future, investors in timberland may earn additional returns from the receipt and resale of carbon credits. However, since the future value of those credits is so uncertain, we have assumed no additional return from this source.

This leaves the question of the appropriate return premium to assume for the overall risk of investing in timber as an asset class. Historically, the difference between returns on the NCRIEF timberland index and those on real return bonds has averaged around six percent. However, since the timber REITS are much more liquid than the properties included in the NCRIEF index, we have used four percent as the required return premium for investing in liquid timberland assets.

Given these assumptions, our assessment of the valuation of the timber asset class at 31 August 2007 is as follows:

1. Forecast supplied return = 4.34% (Div Yld) + 6.00% (Long Term Growth) = 10.34%
2. Return demanded = 2.4o% (Real Bond Yield) + 4.00% (Risk Premium) = 6.40%
3. Return Demanded/Return Supplied = 62%
4. Conclusion: Timber is probably undervalued today.

Our approach to assessing the current value of equity market volatility (as measured by the VIX index, which tracks the level of S&P 500 Index volatility implied by the current pricing of put and call options on this index) is similar to our approach to commodities. Between January 2, 1990 and December 30, 2005, the average value of the VIX Index 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 deviations (95% confidence) range was from 6.65 to 32.25. On 31 August 2007, the VIX closed at 23.38. This is .6 standard deviation above the VIX's long term average value. While the VIX has doubled since the start

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of 2007, its level may still be too low in light of rising uncertainty and growing liquidity problems in global financial markets. Hence, we conclude that equity volatility is possibly still 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

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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. When the rolling returns on different strategies indicate different conclusions about the most likely direction in which the economy is headed, we place the greatest weight on bond market indicators. Why? We start from a basic difference in the psychology of equity and bond investors. The different risk/return profiles for these two investments produce a different balance of optimism and pessimism. For equities, the downside is limited (in the case of bankruptcy) to the original value of the investment, while the upside is unlimited. This tends to produce an optimistic view of the world. For bonds, the upside is limited to the contracted rate of interest and getting your original investment back (assuming the bonds are held to maturity). In contrast, the downside is significantly greater – complete loss of principal. This tends to produce a more pessimistic (some might say realistic) view of the world. As we have written many times, investors seeking to achieve a funding goal over a multi-year time horizon, avoiding big downside losses is arguably more important than reaching for the last few basis points of return. Bond market investors' perspective tends to be more consistent with this view than equity investors' natural optimism. Hence, when our rolling rotation returns table provides conflicting information, we tend to put the most weight on bond investors' implied expectations for what lies ahead.

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

Rolling 3 Month Returns Through	***31Aug07***			
Economy	Bottoming	Strengthening	Peaking	Weakening
Interest Rates	Falling	Bottom	Rising	Peak
Style and Size Rotation	Small Growth (DSG) **-4.19%**	Small Value (DSV) **-7.71%**	Large Value (ELV) **-4.53%**	Large Growth (ELG) **-1.91%**
Sector Rotation	Cyclicals (IYC) **-5.87%** Technology (IYW) **2.59%**	Basic Materials (IYM) **-3.53%** Industrials (IYJ) **-8.61%**	Energy (IYE) **2.28%** Staples (IYK) **-3.37%**	Utilities (IDU) **-7.64%** Financials (IYF) **-11.10%**
Bond Market Rotation	Higher Risk (LQD) **1.18%**	Short Maturity (SHY) **2.80%**	Low Risk (TIP) **3.36%**	Long Maturity (TLT) **4.47%**

The following table sums up our subjective view of possible asset class under and overvaluations at the end of August 2007. The distinction between possible, likely and probable reflects a rising degree of confidence in our conclusion.

Probably Overvalued	Commodities, Corporate Bonds/Credit Risk
Likely Overvalued	Eurozone, Japan and UK Commercial Property, Equity Markets
Possibly Overvalued	U.S. and Swiss Government Bonds
Possibly Undervalued	Australian and UK Government Bonds, Equity Volatility
Likely Undervalued	
Probably Undervalued	Non-U.S. Dollar Bonds (based on expected XR changes); Timber

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Should We Treat Art as a Separate Asset Class?

Regular readers of our publications know that we are constantly searching for new asset classes that provide significant diversification benefits to investors' portfolios. From our perspective, such asset classes are characterized by underlying return generating processes that are in theory significantly different from those of other asset classes, and are evidenced by returns which exhibit a low correlation (e.g., less that .60) with other asset classes. In addition, to be included in our model portfolios, an asset class must offer liquid investment vehicles that are available to individual investors. The question we will address in this article is whether art meets these tests.

Approximately one third of art market transactions take place through auctions (primarily through major U.S. and UK based houses); the remaining sales are done through a large number of art dealers. The most recent data available estimated the value of 2006 auction sales at about U.S. $6 billion, which implies an overall art market value of about $20 billion (others, such as ABN-AMRO, have placed total market value at closer to $30 billion). While the boundaries of the "art" market are inexact, paintings are thought to account for about three quarters of total value.

Let us now look at the return generating process for art as an investment in more detail. One of the most notable aspects of the art market are the high transaction costs involved in purchases and sales – indeed, at 10% to 20%, auction house and art dealer commissions make estate agents look cheap by comparison. Moreover, unlike housing, both buyers and sellers typically pay these commissions. Once a piece of art has been purchased, there are annual costs associated with owning it. These include insurance costs, storage costs (tax authorities are increasingly limiting the deductibility of expenses if the art is displayed rather than stored), and transportation costs (if the art is loaned to a museum, which has the potential to enhance its value). On the other side of the cash flow statement, art generally produces no cash inflows (e.g., like dividends or interest payments) until it is sold.

What then, are the factors that drive changes in the price at which a work of art can be sold? Needless to say, many are at work, and the process is both complex and opaque. On the one hand, there is the issue of future supply, which is definitively limited (except for forgeries) once an artist has died. Demand is harder to gauge, as it is wholly socially

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determined (e.g., in recent years impressionist works have been less popular than works by more contemporary artists). As a recent editorial in The Art Newspaper noted, "for the past century or so, the art world has been supported by four principal pillars: artists, collectors, dealers and the art-historical establishment (critics, academics and curators)…At varying points in the course of the past 100 years, [art world opinion leadership] has shifted from one of the four pillars to another…Over the long term, art-historical value is determined by consensus among all four art-world pillars."

However, the editorial goes on to describe the capriciousness of art valuations: "Today it seems, collectors have taken charge…Great collectors should ideally become nearly as knowledgeable as the curators and dealers who help them build their collections. But not all of today's collectors have the passion or the time necessary to develop this depth of knowledge. Collecting, once the pursuit of a relatively small number of driven individuals, has become far more common among far more people…The huge prices that have been achieved lately at the top of the market are the result not only of new concentrations of wealth, but of the fact that many people are pursuing the same handful of artists and works of art. Therefore, the drop-off from the peak can be steep, becalming the middle of the market and consigning lesser works and lesser artists to also-ran status." Let us be blunt: markets for assets which have few fundamental valuation anchors and where ownership confers social status are markets where herding, bubbles and crashes should be expected to be the norm rather than the exception. They are perfect examples of Lord Keynes' beauty contest analogy, in which the challenge isn't to pick the most beautiful contestant, but rather the contestant that the largest number of other players will judge to be the most beautiful. There is no logical way to analyze these markets; rather, the long term winners are those who can best evaluate the "animal spirits" that drive them.

Given this, we would therefore expect the return generating process in the market for art to be strongly affected by factors which drive returns in other asset classes, including GDP growth, real interest rates, and the availability of liquidity. On the other hand, we can also imagine circumstances whereby extremely wealthy buyers in search of social cache engage in a bidding contest that drives up a particularly popular piece of art even as the economy contracts, interest rates rise, and liquidity shrinks (of course, the publicity that would probably accompany such a shameless display of wealth amid suffering might well prevent it from

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being repeated). To some extent, this view is shared by the sponsors of the new Art Trading Fund (a UK based hedge fund) who claim to have found "ten to fifteen economic indicators and securities that combined have exhibited a .96 correlation with changes in a well-known art market index over the past 30 years." Their logic is that by shorting these securities, they can limit the price risk associated with the works of art their fund purchases.

However, that theory is only as good as the data it is built on (and, of course, the assumption that the underlying relationships inferred from this data will remain stationary over time). This, of course, brings us to the interesting question of just how you construct an index to measure the returns on art as an investment. Before plunging into this discussion, we will let you know where it ends: all of the existing indexes seem highly problematic. In general, there are two approaches to constructing an index that tracks returns on relatively unique assets. The first is a so-called repeat sales index, which only includes returns from works that have been resold at auction. As a relatively small number of works of art meet this test (and, one suspects, those that do suffer from a selection bias problem, in that only works that are expected to fetch a good price are ever sent to the auction house), this approach is limited by its low market coverage. The alternative is a so-called "hedonic" index, which attempts to take into account works that are only sold once. It does this by first characterizing works on a number of subjectively chosen dimensions (e.g., size of the canvas, artist, etc.), and then regressing sale prices on these characteristics. The index is then calculated from the regressions residuals – that is, from the share of the price that cannot be explained by the "hedonic" factors. Obviously, the result of this approach heavily depends on the factors that are chosen to explain price changes.

Regardless of the indexing approach used, all art market indexes suffer from some serious shortcomings. As previously noted, only about one third of art sales take place through the auction houses that provide the date from which the indexes are constructed. Second, there is undoubtedly a selection bias at work in the decision to sell an art work via an auction house. Third, not all pieces put up for auction are sold; many are "bought in" by the auction house when a confidential minimum price is not met. For example, in their paper on "The Collateral Value of Art", McAndrew and Thompson analyze auction data from 1985 to 2001 and conclude that not including these pieces in art indexes leads to the overstatement of art's value (as loan collateral) by 50% to 100%. Fourth, many observers believe that the

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available indexes inadequately capture transaction costs, and none reflect the annual cost of owning a valuable piece of art. Finally, raw art indexes suffer from problems of autocorrelation, or, less technically, the fact that prices tend to have a strong momentum from one period to another, and do not reflect independent valuation assessments in different periods. One of the causes of this is the practice of auction houses and sellers using their judgment to establish reserve (i.e., minimum acceptable) prices for a piece of art; like all subjective appraisals (e.g., in property markets), these judgments are inevitably affected by past sales prices for the piece in question and recent prices for similar pieces. Since pieces are not sold if bid prices fall short of this minimum (i.e., they are "bought in"), those pieces whose prices are included in the index inevitably have a strong period to period relationship. Therefore, to make art index returns comparable to those on other asset classes, a variety of statistical techniques (which again, involve subjective judgment) must be used to remove this autocorrelation (for an excellent paper on art indexes, see "Art as a Financial Investment" by Rachel Campbell).

Unfortunately, these severe problems with art indexes place into serious question the conclusion reached by a growing number of papers (largely based on the comparison of historical data series) that art has a low correlation of returns with other asset classes, and therefore should provide diversification benefits to a portfolio (see, for example, "Art as an Alternative Asset Class" by Rachel Campbell, and "Beautiful Asset: Art as an Investment" by Mei and Moses). Based on our assessment of the factors driving the underlying return generating process, we conclude that the available art index data series seriously understate the likely correlation of art returns with those on other asset classes (for a good example of this, see "Art Loans Get Hung Up" in the September 1, 2007 Wall Street Journal, which describes how debt market turmoil had quickly spread into the art world). We also note that this implies that the standard deviation of art returns is also understated by the current indexes. Finally, when we examine the returns on an art index that has been adjusted for autocorrelation, if not all transaction and ownership costs (such as the ones constructed by Campbell), we find that the average returns on art have been quite underwhelming – e.g., only 1.26% per year (in nominal U.S. dollars) between 1990 and 2006, during a period when annual U.S. (CPI) inflation averaged 3.00%. While the big prices paid for a few pieces of art make the headlines, the reality of investing in art is much less exciting.

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Last but not least, we also note that today it is impossible to invest in an art index, or indeed in any retail art-oriented fund. With the exception of a few small funds for sophisticated investors, art as an asset class is clearly an area where press coverage has raced far ahead of market reality. When all is said and done, we can only conclude that art remains a highly speculative, and very much an active investment. While owning fine art may bring investors great pleasure, and perhaps even social cache, we conclude that its proper place is on their walls, and not in their portfolios.

Jeremy Grantham's Case Against Private Equity

Jeremy Grantham is, in our opinion, one of the best money managers around. He cofounded Grantham, Mayo, Van Otterloo in Boston in 1977, and, via a disciplined approach to asset allocation and a willingness to explore new asset classes, has generated a solid track record over the past thirty years. However, what we really admire about Mr. Grantham is the clarity of this thinking, which is regularly on display in his quarterly letters (which can be found on www.gmo.com).

His July letter contained an extended critique of private equity, and warrants more attention than it has thus far received. Grantham clearly regarded the public market debut of Blackstone Group, and the planned IPO of KKR as signs that the most recent financial market bubble was about to peak. Before delving into his critique, let's quickly review the other side of the argument – call it "why these private equity IPOs are an opportunity you shouldn't pass up!"

Logically, why should an investor expect to earn a high risk adjusted return on an investment in a private equity fund? Broadly speaking, there are two possible answers to this question, which are not mutually exclusive. First, an investor might believe that private equity fund managers are particularly skilled in buying assets (e.g., either companies or divisions of companies) at prices below what they are worth. For example, in their paper "Information Diffusion Based Explanations of Asset Pricing Anomalies", Bolmatis and Sekeris found that "assets plagued with information problems [e.g., assets that have low or no analyst coverage and low trading volume] can be mispriced for sustained periods of time." Another recent paper ("Why Do Firms Use Private Equity to Opt Out of Public Markets?" by Bharath and Dittmar) finds that "firms that ultimately go private are very different and

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discernable in information and liquidity considerations relative to firms that remain public…Specifically, firms are more likely to go private if they have less analyst coverage and lower institutional ownership…and if they are less liquid relative to [comparable firms]." Essentially, this argument is no different from that used to justify investment in any type of actively managed fund – in all cases, the investor believes he or she is able to identify a manager who is skilled at identifying undervalued assets, and that the fees charged by said manager will be less than the incremental after tax returns (above a comparable low cost index fund) the investor expects the manager to generate.

The second argument used to justify investment in a private equity fund is that a manager has exceptional skill in increasing the value of the companies in which the fund invests. To better understand this argument, we'll start with a familiar tool – a simple valuation model. The value of a company is equal to (1) its free cash flow (i.e., operating cash flow after capital spending and any changes in working capital), discounted a rate equal to (a) its weighted average cost of debt and equity capital less (b) the rate at which free cash flow is expected to grow in the future. This model highlights the various levers that private equity firm managers can use to increase the fundamental value of the companies in which they invest:

1. Increase free cash flow
    a. Increase revenue
    b. Cut operating costs
    c. Cut capital spending and/or sell unproductive assets
    d. Turn working capital from a use to a source of cash – e.g., stretch out payables, reduce inventory levels, and speed up the collection of receivables.
2. Reduce the cost of capital
    a. Increase the amount of debt in the capital structure
    b. Use a mix of securities to better meet investors needs
    c. Reduce the company's perceived risk relative to the overall market
    d. Shift borrowing to high tax locations, to maximize the value of the debt tax shield
3. Increase the expected rate of future free cash flow growth
    a. Enter new markets

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b. Develop new offerings
c. Build new technologies and organizational capabilities

Multiple studies have attempted to analyze which of these levers is most important, and to identify the management techniques used by private equity firms to successfully push them. For example, a recent article by Bain and Company identified five so-called "management disciplines" that underlie the "high performance cultures" that private equity firms attempt to create at the firms in which they invest. These include:

- Hiring managers who act like owners;
- Defining a clear 3 to 5 year investment thesis – "a succinct point of view about how the company will achieve a significant increase in value";
- Making capital work harder;
- Focus metrics on key value drivers;
- Having the private equity firm act as an active shareholder (e.g., by challenging company managers' forecasts and plans).

Obviously, making money in private equity is a lot harder than this and similar articles make it sound, since only the top quartile of private equity firms generate substantial returns – the performance of the remainder has generally been inferior to the public equity market (e.g., Apollo Investments has been public since 2004, and has at best matched the performance of midcap value index funds). The comparison is even more unfavorable for private equity if public market returns are leveraged (e.g., by buying a broad market ETF on margin) to match the amount of debt typically employed in the capital structures of companies owned by private equity funds.

There are many reasons that most private equity firms end up disappointing their investors. As we have pointed out in past articles, these include:

- In today's highly competitive markets (for both customer and shareholder support), the easy pickings in the form of poorly managed, underleveraged public companies

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with lots of fat to cut are long gone. Today, most public companies employ more leverage than in the past, watch their costs much more carefully.

- Similarly, the days of private equity firms buying assets at a deep discount to their fundamental value are also largely over. Investors are more familiar with the potential for information and liquidity issues to cause undervaluation, and companies selling assets to private equity firms now often utilize auctions and set minimum prices that reflect the additional leverage that private equity firms are expected to employ.
- At the same time, there are many more private equity firms bidding on these deals, which also tends to drive up acquisition prices and make earning very high deal returns much more difficult.
- Last but not least, when it comes time for a private equity firm to cash out by selling a portfolio company, both trade and IPO buyers have become more sophisticated, particularly about the extent to which certain private equity management techniques (e.g., cost cutting) may have adversely affected a company's competitiveness and future growth prospects.

With the low hanging fruit largely picked from the deal trees, private equity firms have moved in a number of predictable directions in the search for high returns:

- Expanding into less competitive markets in Asia, Europe and developing countries;
- Banding together (in so called "club deals") to buy companies that were previously thought too large to be targeted by private equity (and which therefore may retain some of the attractive qualities of the "fat easy targets" of the good old days);
- For the most successful firms, using their track records to convince banks to lend more money to a company after it is taken over by said private equity firm than they would have when it was owned by public shareholders (of course, it is also quite likely that because of the much more liquid secondary market for loans, bankers traditional love of nice closing dinners, and their need to do deals in order to earn the bonuses that pay for those nice summer houses in Italy and the Hamptons, bankers really don't require much convincing to make these loans);

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- Adding so-called "operating partners" to their teams – people who spent their careers running companies, rather than structuring financial deals – to help portfolio companies find ways to improve their competitiveness and grow their revenues.

Clearly, for some private equity firms, these new techniques have generated impressive returns. For example, long after all of us have departed this earth, people will still read about Ripplewood's purchase of the bankrupt Long Term Credit Bank of Japan, its transformation into Shinsei Bank, and its fabulously successful IPO.

On the other hand, the jury is still out on the results of club deals. We suspect that the eventual investment results will largely be disappointing. Frequent readers know that we are strong believers in the usefulness of complex adaptive systems theory, which we believe provides great insight into the functioning of markets and organizations. One principle that emerges from this body of work is that a system exists in one of three states, depending on the balance between its internal and external connectivity. A firm with a high level of internal connectivity (say a company with many connections between functional or business units, who all must agree before any change can be made) and a low level of external connectivity (say, the company serves only a limited number of customers in a limited number of markets) usually suffers from excessive stability, and an unwillingness and inability to change. It is at high risk of failure when and if there are significant changes in its competitive environment. At the other end of the spectrum, a company with a high level of external connectivity (say, a young company that is serving a wide range of customer types) and a low level of internal connectivity (e.g., functional teams that have largely operated independently) often chaotically lurches from one initiative or fire drill to another, as it reacts to every change in its environment. In between these two extremes lie companies with relatively balanced levels of internal and external connectivity, which are said to operate in the zone of maximum creativity and adaptability.

In the context of private equity, the challenge in many of the smaller deals that make up most of private equity's performance history was to increase internal connectivity (e.g., by helping portfolio companies to get basic management processes right), and selectively reduce external connectivity (e.g., by improving "strategic focus" on a few key products or market segments). In contrast, the challenge of creating value in large "club deals" lies at the other

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end of the spectrum – reducing internal complexity, while building a wider variety of links to the external environment (e.g., "spend less time focusing on internal politics and accounting manipulations, and more on customers, competitors and technology"). In our view, this challenge is outside the experience of many private equity managers, and much more difficult than the challenge of turning around a smaller firm.

Our experience with previous debt crises (energy, real estate, and less developed countries) also tells us that the writers in the future (and probably a few Congressional committees) will question the economic logic behind many of the loans made by bankers to private equity firms in recent years. While it may sound simplistic (and not a little bit cynical) to point to bankers making their bonuses by giving much bigger loans to private equity backed companies than they would have if those companies had remained public, it often seems that this phenomenon lies behind more successful private equity deals than anybody in the industry would like to admit.

Finally, while a few firms (e.g., Bain Capital, which could draw on its deep roots in management consulting) seem to have generated impressive returns via the operating partner model, in many other cases the model seems to have fallen short (see, for example, "Operating Partners Promise Performance and Higher Returns, but Do They Always Deliver?" in Knowledge@Wharton). Regardless of what private equity firms tell investors about their managerial skills, the brutal truth is that in a world of intense global competition, rapid change and high uncertainty, substantially improving a company's performance (and especially revenue growth) is a very, very difficult challenge.

All of these considerations bring us to Jeremy Grantham's trenchant critique of investors' recent swoon for private equity. He notes that "in private equity, the competence of individual managers is mightily confused by two different factors. First, in a world of [cyclically] rising corporate profit margins [which, as Grantham notes, are at a record high as a share of GDP, and must at some point, revert towards their long-term mean], all managers appear to have talent, for they naturally enough represent that they, rather than the broad economy, are the cause of the margin improvement. Few buyers of their services are sophisticated enough to normalize for this effect". The second confusion is caused by leverage which, at least in the short term, often boosts returns on equity, provided changes in economic conditions don't cut the cash flow needed to service higher debt loads.

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As Grantham notes, "easy credit, low to negative risk premiums, rising profit margins, and high P/Es have created the opposite of the perfect storm – the perfect calm – for private equity. Extraordinary talent does not come into play except for the very best. It is the classic case of a rising tide lifting all boats. The unique aspect of this tide is how colossal the fees are and how colossally undeserved they are for the great majority of managers."

Granthan then goes into an extended explanation of this last point. He starts with the observation that private equity firms pay average takeover premiums of about twenty five percent for the companies they buy. He notes that, in order to earn an attractive return on a private equity deal, its takeover premium must be earned back. Grantham then illustrates the difficulty of doing this, "assuming different degrees of private equity manager talent and varying degrees of favorableness in the general environment." Grantham concludes that "in almost all cases, the combination of the starting takeover premium plus the private equity fund's fees wipes out the effect of substantial professional talent [where it exists] in improving portfolio companies, and only leverage hides this fact." In a series of excellent quantitative examples (well worth downloading from www.gmo.com), he shows how the combination of high leverage, unimpressive talent, deteriorating economic conditions, and high private equity fund fees will likely "cause future private equity returns to be disastrous."

Estimating the Future Real Risk Free Interest Rate

In almost all approaches to asset allocation, the future real risk free rate of interest is a core and critical assumption. Expected returns on different asset classes are usually estimated by adding a risk premium (which itself represents the average of a range of possible outcomes that likely vary over time) to the expected real return on the risk free asset. Despite this, relatively few articles have been written about the future real risk free rate, in comparison to the very large number that have been written about the "right" number to use for the equity risk premium. With that in mind, and in light of our upcoming asset allocation review, we thought this would be a good time to take a closer look at estimates for the future real risk free rate.

In theory, the real risk free rate of interest we observe reflects the balance between savings and investment within some region. Therefore, to better understand the real rate of interest, we have to understand the medium drivers of savings and investment and therefore

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the normal (also known as the "natural") real rate of interest. As anybody who has studied economics can attest, there is no shortage of models that claim to explain and/or forecast the level of savings and investment. In our work, we try to keep things simple, and focus on a limited number of variables that we believe drive real rates in the medium to long term.

In our model, two variables drive the level of savings: investors' average level of risk aversion, and the length of their time horizon. These two are related, as more prudent investors will tend to be more risk averse, have a longer time horizon, and save more, while less prudent investors will tend to be less risk averse, have a shorter time horizon (i.e., have a greater preference for immediate consumption relative to future consumption), and save less. In practice, the time horizon variable is typically expressed as a discount rate – the shorter your time horizon (or, to put it another way, the more impatient you are to consume), the higher your so-called "time discount rate." For example, a person for whom $100 of consumption today is much more valuable than $100 of consumption tomorrow would have a high time discount rate.

Unfortunately, putting this theory into practice is far from easy, as the "correct" definition and level of risk aversion and the time discount rate have been endlessly debated by academics (for two excellent and creative recent studies – that naturally reach different conclusions – see "Risk Aversion and the Subjective Time Discount Rate: A Joint Approach" by van Praag and Booij, and "Option Implied Risk Aversion and Elasticity of Intertemporal Substitution" by Douglas Blackburn). Another aspect of this problem is just how exactly "savings" should be defined – should it only include savings out of income, or should it also include increases in the value of investments? How you answer this question makes a very big difference to whether you believe savings have risen or fallen in the United States and other countries in recent years (on balance, we have opted for the conservative approach, and view savings as not consuming current income, and not asset valuation gains).

Our assessment of the studies we have reviewed is that a person's level of risk aversion and time horizon is probably decision specific. To put it differently, the answers you get are heavily dependent on the examples you use when eliciting the preferences of whatever group you are studying. If you try to infer risk aversion and time discount factors from a survey asking about going out for pizza tonight versus next week, you are likely to get very

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different answers than if you asked about how much to save and what percentage of that to invest in different asset classes to achieve a twenty year accumulation goal.

When it comes to investment decision making, we believe that a risk aversion factor of between 1 (less risk averse) and 6 (more risk averse) seems reasonable in light of many studies' conclusions (technical note: we are assuming a simple quadratic utility function here, rather than more realistic ones based on prospect theory or a threshold/minimum acceptable rate of return). Similarly, our time discount rates (which are correlated with different risk aversion factors) of between .75% (for long time horizons) and 3.25% (for short time horizons) are consistent with some of the studies that have looked at this issue in the context of investment decision making.

Let us now turn to the other side of the equation – the demand for capital. In theory, for a given level of savings (in this case, think of it as supply), higher expected returns on capital will generate higher levels of desired investment (i.e., demand for savings), which in turn will cause the real rate of interest to increase. The key question is therefore what factors drive the expected return on capital. The good news is that this is a less contentious question than the right estimates for risk aversion and the time discount rate. For a given amount of labor, the expected return on capital is a function of two factors. The first is the expected change in the productivity of capital, or the amount of additional output a unit of new capital is expected to produce. The change in output reflects changes in three variables: the amount of capital employed, the amount of labor employed, and the change in total factor productivity. Assuming a constant level of labor input, and taxes, the expected change in the productivity of an incremental unit of capital is the same as the expected change in total factor productivity. All else being equal, the higher the expected growth in total factor productivity, the higher the demand for capital and the higher the expected real interest rate.

But what happens if the level of labor input isn't constant? This brings us to the second factor that drives the demand for new investment. If less labor is available, it will be able to command higher wages, which will be paid out of the expected increase in output. In this case, the expected change in total factor productivity will overstate the expected return on capital, and the demand for additional investment will be lower. All else being equal, this will reduce the expected level of the real interest rate. The same is true for an increase in taxes on corporate profits.

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Let's now try to use this model to understand what has happened to real interest rates in the past. In a recent paper ("Joint Estimation of the Natural Rate of Interest, the Natural Rate of Unemployment, Expected Inflation and Potential Output"), Benati and Vitale of the European Central Bank find quite extensive variation over time in the real rate of interest in Australia, the U.K., U.S. and (for a shorter data series), the Eurozone. For example, they find that real interest rates in the U.S. declined from 2.7% in the mid-1980s to 1.7% by 2006; in Australia, the U.K. and the Eurozone, comparable 2006 real rates were 1.5% and 1.6%, and 1.7%. (Two additional recent works on this issue are "The Natural Rate of Interest: Concepts and Appraisal for the Euro Area" by Cuaresma, Gnan, and Ritzberger-Grunwald, and "An Empirical Approximation of the Natural Rate of Interest and Potential Growth" by Manrique and Marques). What combination of factors could have caused this decline in real rates?

Logically, the two hypotheses revolve around a fall in the level of investment or an increase in the level of savings. Between 1970 and 1979, gross private investment on average equaled 16.8% of U.S. Gross Domestic Product. During the 1980s, this remained about the same, at 16.9%, before declining to an average of 15.5% during the 1990s. However, between 2000 and 2005, the average rose to 16.1%, reaching 16.5% of GDP by mid-decade, which is consistent with the increase in total factor productivity rates observed during this period, as well as the rise in corporate profits as a share of GDP. Moreover, traditional national income accounting measures may actually understate the actual level of investment spending in an economy moving from the industrial to the information age. Specifically, certain spending that is intended to create value over multiple periods in the future (one definition of a capital investment), such as research and development and employee education and training, is still shown as an expense rather than an investment. If anything, the United States' GDP data probably understated the actual increase in "investment" spending since 2000.

Moreover, to private investment must be added another source of demand for domestic savings – financing the combined deficit of federal, state, and local governments. During the 1970s, these deficits averaged 1.2% of GDP, rising to 3.0% in the 1980s, falling to 2.0% in the 1990s, but rising again to 2.5% of GDP by 2005. The combined total of gross private investment and the government sector deficit amounted to 18.0% in the 1970s, 19.9% in the 1980s, 17.5% in the 1990s, and 19.0% by 2005. So while falling demand for savings may

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well have exerted downward pressure on the real risk free rate during the 1990s, rising private sector investment and government deficits in recent years are clearly at odds with the fall in real rates we have experienced, unless they were more than offset by a substantial increase in private savings.

Yet this is exactly the opposite of what seems to have happened. In the United States, gross private saving averaged 18.4% of GDP during the 1970s, rose to 19.3% during the 1980s, then fell to 16.3% of GDP during the 1990s and to only 14.4% of GDP by 2005. This fall is clearly consistent with falls in the risk premiums for investments in many asset classes (i.e., with a fall in risk aversion) as well as a shortening of time horizons and a rise in consumption as a share of GDP. If anything, the domestic savings/investment balance seems to have suggested that a rise in real interest rates should have been in order, rather than the decline we have actually observed. Clearly, another factor must have been at work.

The mystery variable was the foreign exchange policies pursued by nations in two critical areas – the Middle East and Asia. By pegging their currencies to the U.S. dollar, these nations created a de facto dollar block, within which aggregate savings and investment, not just savings and investment in the United States, were the key determinants of the level of the U.S. dollar risk free interest rate. More specifically, the data suggest that it was a very sharp rise in the level of savings in these regions that was the most important driver of the counterintuitive fall in the risk free real interest rate that we have observed. For example, in the Middle East, investment averaged 22.9% of GDP during the 1980s, 23.8% during the 1990s, and stood at 22.2% of GDP in 2005. However, over the same period, savings as a percentage of GDP had risen from 23.6% to 40.8% of GDP. In China, the current account balance as a percentage of GDP (which reflects the excess of savings over investment) went from an average deficit of .3% of GDP during the 1980s to a surplus equal to 7.2% of a much larger GDP by 2005. Of course, this raises the question of what factors caused these sharp increases in savings to occur. In the case of the Middle East, it was the combination of economic and political factors that drove up oil prices and revenues, coupled with the inability or unwillingness of these countries' governments to spend and invest all the windfall revenues they received; in short, prudent macroeconomic management was largely to blame. China, however, presents a different case, and gives the appearance of other factors being at work. Specifically, a number of factors, including China's failure to invest in strong national

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pension and healthcare systems, and its attempts to restrict the growth of domestic consumption, even as investment and export earnings soared, combined to produce a dramatic rise in its savings (i.e., these policies contributed to high levels of risk aversion and low time discount rates on the part of its population its). A high percentage of these savings (in the form of recycled current account surpluses) were then invested in U.S. government securities, which in turn held down the real risk free rate in the United States.

In the Eurozone, the factors driving the decline in the real risk free rate appear to be quite different. Private savings and investment as a percentage of GDP have remained in rough balance, while a sharp fall in government deficits appears to have driven the real risk free rate to the lower levels we observe today.

So how should we expect real risk free rates to behave in the future? We believe that there is a good chance that at least two different scenarios could develop. In the first one, the Eurozone, United States, United Kingdom and Japan continue to struggle with faltering national pension and health care systems. This should naturally lead to an increase in risk aversion and a fall in the time discount rate, which should stimulate higher savings levels. Any fall in asset values (say, home prices) will only further accelerate this trend. On the investment side, corporate profits as a share of GDP in the United States averaged 8.4% between 1970 and 1999. However, by 2005 they had reached 10.7%, at least in part due to the sharp increase in the supply of labor caused by the entry of China and India into the global economy. This same period also saw a sharp increase in total factor productivity growth, driven by the combination of heavy investment in information technology and then changes in organizations that have allowed the full benefit of these investments to be realized. However, we expect both of these trends to reverse in the future. The data already show that labor costs, and particularly the cost of skilled labor, is rising in China and India as these factors of production are increasingly priced on a global basis. This suggests that corporate profits as a percentage of GDP should start to revert back towards its long-term mean in the years ahead. In addition, given the rising concern with climate change, we also believe that some type of carbon emissions tax (or its functional equivalent, a system of tradable emissions permits which companies will have to purchase, perhaps via an auction process) will be enacted in the near future. This will also reduce the share of productivity gains that are captured by the owners of capital, and thereby reduce their desired levels of investment spending.

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There are, of course, two big uncertainties in this scenario. The first is the future evolution of the so-called "de facto dollar bloc", and the second is the future size of government deficits. For example, growing trade frictions (or a political decision on the part of the Chinese leadership to destabilize the global economy) could cause a sharp fall in foreign savings flows into the United States, causing the economy to slow and government deficits to rise as automatic stabilizers (e.g., unemployment and welfare spending) kick in. While the net impact on real yields is hard to estimate, it seems reasonable to conclude that, like other asset classes, returns on inflation protected government bonds (our proxy for the real risk free rate) could vacillate between two different regimes, one with relatively low and stable rates, and another with relatively higher returns and more volatility. In fact, this type of regime switching behavior is just what the authors of another paper ("The Term Structure of Real Rates and Expected Inflation" by Ang, Bekaert and Wei) found was the case in the past. Looked at differently, these findings imply that the current yield on real return government bonds (e.g., 2.20% on 10 year TIPS) represents the weighted expectations of yields under at least two different possible future regimes.

The future level of the real risk free rate of interest is a critical building block in the estimation of future returns for other asset classes. Unfortunately, relatively few articles have been published to help analysts estimate its future level under different regimes. We hope that this article has provided our readers with a better understanding of the underlying processes at work, and how they might develop in the future.

Comments on the Recent Market Excitement

Following our May article about why we weren't sleeping well at night, a number of readers have asked for our thoughts on recent events in world financial markets. Our first reaction is that all financial crises seem to have the same underlying plot: greed and overconfidence beget excessive leverage and bubbling prices, which eventually lead to disaster once the inevitable but unexpected shock finally arrives. The most recent rendition of this timeless story is well told in a series of papers that were published in recent months. In "Money for Nothing and Checks for Free", Kiff and Mills of the International Monetary Fund review the developments that led to the first appearance of the U.S. subprime mortgage crisis in February

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2007. The entire cast of characters is on display. These included mortgage brokers (who, at some point, rebranded themselves as "mortgage bankers"), lightly regulated at the state level, who were compensated on volume and the actual mortgage companies, who were also compensated on volume, and funded loans for only a short period of time before selling them to investment banks. At this point, financial alchemy ensured, with mortgages being repackaged into securities and then into complex structured investment vehicles. In their simplest form, these SIVs took a series of cash inflows from the mortgages and used them to make payments on different classes of securities. The most deeply subordinated of these SIV securities earned the highest returns because they were the first to absorb the cost of any mortgage payment delays or defaults; the most senior securities had first dibs on any cash received, and were therefore more highly rated. And here again we find the key players involved compensated on the volume of deals they did in any given year, and not how the securities they created actually performed over time. Why? Because those securities were then sold by the investment banks to various hedge funds, pension plans, commercial banks and other parties, whose capital reserves were the next to ultimate support for the risks inherent in this system.

Obviously, there is one more important character involved in this tale, and that is the people who took on the original mortgage loans. As Robert Shiller describes in his new paper "Understanding Recent Trends in House Prices and Home Ownership", many of these people were undoubtedly caught up in the excitement of an unprecedented boom in house prices. Shiller notes that "it does not appear possible to explain the boom interms of fundamentals, such as rents or construction costs." He notes that this bubble may yet end in tears, and concludes "there is a high probability of steady and substantial real home prices declines extending over the years to come." As anybody (like us) who watched real UK housing prices rise by about 50% during the 1980s, and then give up all these gains can attest (as can anybody who lived in Japan), radical deflations of housing prices are eminently possible. That being said, we find it hard to accept the notion much beloved by politicians these days that all these borrowers were naïve victims led astray by evil mortgage and investment bankers. A number of papers written about the development of the internet bubble in the late 1990s found strong evidence of so-called "rational" bubbles, in which people stayed invested in markets they believed to be overvalued, based on the belief that they would recognize the

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top before their peers, and thereby maximize their returns (see, for example, "Perspectives on Behavioral Finance: Does Irrationality Disappear with Wealth?" by Annette Vissing-Jorgensen, and "Synchronization Risk and Delayed Crashes" by Abreu and Brunnermeier). As John Maynard Keynes noted in 1936, "the actual private object of most skilled investment today is to beat the gun…[It is] a battle of wits to anticipate the basis of conventional valuation a few months hence, rather than the prospective [return] on an investment over the long term." He famously likened it to a beauty contest, in which the objective was to pick the contestant that would be chosen as most beautiful by the majority of your peers.

What we find more interesting is why so many people have been willing to suspend their disbelief and plunge into the housing market in the hopes that prices would continue to rise at dizzying (if you were a seller) or nausea inducing (if you were a buyer) rates. Our conclusion is that many people had a desperate need to believe that the housing market was the way out of the increasingly desperate predicament in which they found themselves. As we have noted in the past, in recent years a number of trends have come together that have collectively placed great strain on the American middle class (and indeed the middle class in other Anglo Saxon countries). The performance of America's public schools has been in steady decline, forcing many parents to send their children to expensive private schools, even as the cost of university education continued to increase at well above the rate of inflation. At the same time, health insurance costs have continued their rapid rise, forcing companies to shift more of the burden onto the paychecks of employees (while in countries with national healthcare systems, spiraling costs translated into either longer cues, higher taxes, or both). With the future of social security in doubt, and fewer companies than ever offering defined benefit pension plans, retirement income security risks have loomed larger than ever. Yet the logical response to many of these trends – higher saving – was increasingly out of the question, as the combination of a more unequal income distribution and a "keep up with the Joneses" mentality forced more and more people into deeper amounts of debt just to maintain their desired level of consumption spending. And all this was happening as increasing globalization was reducing job security and limiting wage increase. Perhaps never before had Thoreau's observation that "most men lead lives of quiet desperation" been so true for so many. Given this, it is not hard to understand how so many people saw in the housing boom a

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way out of the situation they were in, and so were willing to suspend their disbelief in the sustainability of the pricing and returns they observed all around them.

Unfortunately, the consequences of this temporary euphoria may end up being severe. In their recent paper "The Rise in U.S. Household Indebtedness", Dynan and Kohn of the U.S. Federal Reserve elaborate on this theme. "In the United States, the personal saving rate has falledn form an average of 9.1% of household income in the 1980s to an average of 1.7% so far this decade. Between the same periods, the ratio of total household debt to aggregate personal income rose from .6 to 1.0…The increase in house prices, particularly but not exclusively over the past half dozen years, appears to have played the central role in explaining the sharp rise in household borrowing…[Consequently], U.S. household spending has come more exposed to shocks to asset prices…Moreover, the reaction of the financial markets to these developments raises the possibility that credit availability could be hampered, which would in turn have effects on the broader economy."

Those effects are described not only in the previously cited paper by Robert Shiller, but also in another new paper from the Levy Institute, entitled "The Effects of a Declining Housing Market on the U.S. Economy" (by Papadimitriou, Hannsgen and Zezza). The authors note that "longstanding speculation about the likelihood of a housing market collapse has given way in the past few months to consideration of just how far the housing market will fall and how much damage the debacle will inflict on the economy." They conclude that "the stage has been set for very serious and widespread economic difficulties, which may have begun to unfold. Policymakers cannot possibly forestall further declines in home values, save the more reckless mortgage lenders from bankruptcy, or bail out every overextended household."

As we progress through the challenging years that lie ahead, it seems likely that the role of government – particularly in the United States – is set to become more important than it has been in the past, whether in the area of providing retirement income security, health care, education funding and/or unemployment insurance. This makes all the more disturbing a recent series of speeches and papers by David Walker, the Cmptroller General of the United States. For example, in his recent paper "Transforming Government to Meet the Demands of the 21st Century," Walker notes that "at the start of the 21st century [the United States] faces a range of sustainability challenges: fiscal, health care, energy, education, the environment,

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Iraq, aging infrastructure, and immigration policy, to name a few. These challenges are complex, and of critical importance…Unfortunately, our government's track record in adapting to new conditions and meeting new challenges isn't very good." Walker clearly states that "transforming government and aligning it with modern needs is even more urgent because of our nation's large and growing fiscal imbalance. Simply stated, America is on a path toward an explosion of debt…With the looming retirement of the baby boomers, spiraling health care costs, plummeting savings rates, and increasing reliance on foreign lenders, [the United States] faces unprecedented fiscal risks. Long range simulations from my agency are chilling. If we continue as we have, policymakers will eventually have to raise taxes dramatically and/or slash government services the American people depend on and take for granted." And onto this creaking fiscal structure we are now going to load the consequences of the mother of all real estate crises. Needless to say, recent events have not caused us to change our views about what may lie ahead (for more on this, see our April 2007 and July 2007 Economic Updates).

Another interesting aspect of recent developments has been the way information and liquidity risks have interacted to create a vicious feedback loop that has forced central banks to step in to keep systemic liquidity and solvency risks in check. In our November, 2006 issue, we described the mechanism behind the events we saw in the summer of 2007 (which have also been very well described by Gillian Tett and Martin Wolf of the Financial Times): "Unfortunately, market microstructure mechanisms don't always function smoothly. And when they don't, funding problems are usually involved. We have seen how either an asset price shock (i.e., a sudden and substantial change in the price of a security) or simply an increase in the amount of uncertainty [e.g., an information shock] felt by traders can lead to the development of large gaps in the limit order book and give rise to a sequence of large price changes (i.e., clustered volatility). Moreover, we have seen how this can become a self-reinforcing process, with rising volatility begetting rising uncertainty and falling liquidity. The line that separates normal liquidity fluctuations from liquidity crises is the one that triggers margin calls by the lenders to market makers and traders. When this happens, the process can become supercharged, with a sharp increase in the order imbalance (i.e., with market sell orders dominating), the disappearance of market maker liquidity, and the accelerating cancellation of limit buy orders by confused and liquidity constrained traders.

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Moreover, it is easy to see how this type of problem can spread across asset classes via the funding channel. In this sense, clustered volatility and liquidity crises may be the root cause of correlation risk (i.e., the risk that, when markets decline, the correlation between some, if not all, asset classes tends to rise)…

"Recent changes in market microstructure may also have increased the likelihood that a serious liquidity driven tail event will eventually occur. Increasing competition between active managers has caused them to focus more closely on ways to limit the price impact of their trades (defined as any adverse changes in bid/ask spreads and/or market prices before they are completed). This has led to the widespread use of trading software (algorithms) that breaks large orders down into small orders, and executes them over time. The use of these algorithms was made possible not only by changes in the rules of traditional stock exchanges (e.g., that facilitated the automatic execution of small orders), but also by the development of electronic crossing networks (ECNs) that, in essence, are software algorithms that match buy and sell orders at a lower price than those charged by the major exchanges. To further minimize traders' market impact costs, brokers have also developed so-called "dark pools" of liquidity. So long as their volume in a stock does not exceed five percent of total volume, these dark pools are exempt from the regulatory requirement that they display their order book to potential traders. The advantage to traders is that by crossing their orders in such dark pools, they can better hide their trading activities, and prolong the advantage they gain from whatever forecasting advantage they may possess. One recent estimate was that in the United States, twenty percent of share trading volumes now takes place via dark pools.

"As described by Hasbrouck and Saar in a recent paper ("Technology and Liquidity Provision: The Blurring of Traditional Definitions"), this new market microstrucuture, "the role of posted prices (i.e., limit orders) is diminished, and…searches for hidden liquidity [often by software algorithms] are needed to achieve [the best execution price]." So, we now have a situation in which the world's real economy is faced with unprecedented imbalances, the world's financial markets have experienced a prolonged and historically unusual period of low volatility, and the players at the heart of the system are making liquidity harder to find. If that isn't a recipe for an eventual crisis, we don't know what is."

More recently, in June 2007, the Bank for International Settlements also published a paper ("Distress Selling and Asset Market Feedback" by Shim and von Peter) that takes an in-

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depth look at this phenomenon, and anticipated some of the events that eventually occurred in August. More than anything, recent financial market events have confirmed last year's comment by Raguhram Rajan (then the IMF's Chief Economist) that many money managers' strategy of earning returns by bearing liquidity risk amounted to "the poor man's alpha", pursued by active managers who lacked superior forecasting skills but their 2% of the assets under management and 20% of the profits compensation plan. He presciently noted that the success of this strategy depended on two conditions being maintained: the absence of low probability, very costly events, and the managers' continued access to cheap funds to finance their leveraged long positions. To put it another way, when asset prices are rising, you can make money by taking a long position in liquid assets and a short one in liquid liabilities – e.g., funding a leveraged investment in mortgage CDO securities with short term commercial paper borrowing. However, when markets are falling, this is a recipe for disaster; the way to make money under these circumstances is to be short the illiquid asset (e.g., selling CDO securities short), and long the liquid asset (e.g., investing the short sale proceeds in short term government debt).

Finally, it is always instructive to review how different asset classes respond to periods of high stress in financial markets. The events seen in August have once again reinforced the benefits of investing a well diversified portfolio of broadly defined asset classes. Let's look at how different U.S. dollar asset classes performed between the end of July and the end of August. Real Return Bonds, Domestic Investment Grade Bonds, and Foreign Currency Bonds all saw gains, as did Domestic Equity and especially Timber. These gains moderated the impact of declines in Domestic Commercial Property, Commodities, Foreign Equity, Emerging Equity and Equity Market Neutral/Uncorrelated Alpha Strategies (foreign property was basically unchanged, as was equity market volatility, which was up over 100% year to date through both July and August). On the other hand, this year has once again demonstrated how hard it is for a well-diversified portfolio to deliver significant returns during a year when an investor's home currency experiences a substantial appreciation. For example, our equally weighted portfolios are all struggling this year in regions that have seen substantial currency appreciation, including the Eurozone (up .9% through August), the U.K. (down 1.0%) and Canada (down 1.8%).

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Overall, the summer of 2007 has been an interesting one for many reasons, some quite disturbing, and others reassuring. So while we're not looking forward to what we think lies ahead, we can take some comfort in the sense that we broadly understand the major forces at work, and how investors should position themselves to manage the risks and opportunities they may create.

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Product and Strategy Notes

Bad News for Technical Trading Rules

There is almost no limit to the number of active investing strategies based on so-called technical trading rules, which buy and sell securities based on changes in their prices or trading volume. Examples of these include so-called "support and resistance", channel, and moving average rules. However, a new paper has called their profitability into question. In "Can Commodity Futures be Profitably Traded with Quantitative Market Timing Strategies?", Marshall, Cahan and Cahan test over 7,846 rules using historical data on the performance of 15 commodities between 1984 and 2005. They conclude that "while we cannot rule out the possibility that technical trading rules compliment some other trading strategy, we conclusively show that they are not profitable when used in isolation, despite their wide following."

Investing in Emissions Certificates: An Update

In Canada, a preliminary prospectus has been filed by GHG Emission Credit Participation Corporation (www.ghgemissioncredit.com). The new company is a vehicle for investing in this new asset class (see our previous article on this in our November 2006 issue). While it remains to be seen how whether a straightforward tax on carbon emissions or tradable emission certificates (which would create a new asset class) will end up as the dominant approach to managing the global warming problem (as the Wall Street Journal recently noted, economists favor the tax, while politicians favor tradable credits), we expect to see a growing number of retail oriented products launched in this area in the months ahead. At least in the short term (while the carbon market is in its infancy), there may be substantial opportunities for skilled managers to earn active management profits. Further confirmation of this comes from a recent research paper ("Are the European Carbon Markets Efficient?") by Daskalakis and Markellos, which concluded that restrictions on short selling and market fragmentation mean that, at least for the time being, this market is still far from efficient.

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More Evidence on Why Active Managers' Success is So Often Self-Defeating

In their landmark 2004 paper ("Mutual Fund Flows and Performance in Rational Markets"), Berk and Green proposed an innovative theory of why active management success was not likely to persist. Skilled fund managers' success would attract such a large amount of new investment that diseconomies of scale would develop, forcing their returns back towards or below the market average. Berk and Green hypothesized that these diseconomies could include difficulty and expense in identifying attractive opportunities for deploying larger amounts of capital, and higher trading costs. However, since fund managers' compensation is in part tied to the size of their assets under management, Berk and Green concluded that the most skilled active managers would still end up with the highest compensation, even if this did not lead to superior returns for investors.

A recent paper provides evidence that one of Berk and Green's hypothesized scale diseconomies in fact exists. In "Scale Effects in Mutual Fund Performance: The Role of Trading Costs", Edelen, Evans and Kadlec study 1,706 U.S. equity mutual funds between 1995 and 2005. They find that "mutual funds trading costs are comparable to the expense ratio (144 basis points versus 123 basis points, respectively), but have higher cross sectional variability… Trading costs have an increasingly detrimental impact on performance as the fund's relative trade size increases." The authors define "excessive trading" as trading whose cost are larger than the additional value created by the trade. Some of this they attribute to funds reasonably accommodating investors' demand for immediate liquidity. However, this factor does not fully explain the apparently excessive trading. Hence the authors conclude that other factors, such as the need to generate so-called "soft dollars" (a portion of trading commissions that are used to obtain research, data and other services from brokers) are at work, and detract from the returns to investors in these funds.

Interesting New Products – For a Variety of Reasons

It seems that not a week goes by – even during the traditionally slow month of August – without another slew of new index investment products being launched. Needless to say, we don't write about most of them – let's just say that we are not big supporters of the continual

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creation of so-called "index" products based on increasingly narrow segmentations of broad asset classes. If you've read our publications for any length of time, you know that we believe that this "slice and dice" approach to product development essentially encourages active management that is likely to be detrimental to most investors' long-term economic health. As we have repeatedly noted, we believe that there are potentially three arguments to support taking these "tilts." First, one could believe that the higher or lower expected returns from these tilts rationally reflect higher or lower risks associated with them. Fair enough; however, we question the efficacy of adjusting a portfolio's risk/return parameters by taking tilts within an asset class rather than adjusting the weights given to different asset classes (since the correlations between tilts within an asset class are likely to be much higher than the correlations between broadly defined asset classes).

Second, one could believe that the return premiums on different tilts are time varying, and that one has superior forecasting skill, and is therefore able to earn significant (read: positive after transaction costs and taxes) risk adjusted returns by switching between different tilts over time. Again, we understand the argument, but also note that when a room of 100 people is asked to rate their driving skill, well over 50% believe they are above (and often well above) average.

Third, an investor taking a tilt could believe that, rather than rational compensation for additional risk, the additional return he or she expects to earn reflects systematic mistakes being made by other investors. While we have the utmost respect for this type of behavioral finance argument, we also note that most investors who make it fail to acknowledge its second part – to generate alpha (positive risk adjusted returns), one must also believe that there are durable barriers that prevent other investors from taking advantage of the errors you recognize, and in so doing competing their excess returns down to zero. The bottom line: if you can recognize and exploit investment opportunities created by other investors' systematic mistakes, why can't everyone else?

For all these reasons, you haven't and won't see us gushing over many new product announcements. On the other hand, some new product announcements do interest us. In particular, and in keeping with the approach we have supported for many years, we are enthusiastic supporters of new products that give retail investors passive access to new broadly defined asset classes that have significantly different return generating processes from

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existing investment options. We are also supporters of new actively managed products whose returns are expected to have a low correlation with returns on broadly defined asset classes – these are also known as "uncorrelated alpha" products. Our model portfolios currently contain modest allocations to so called "equity market neutral" and one currency trading product that meet this test. Finally, in the past we have also noted that investors who want to shift their allocation to different asset classes in pursuit of higher returns (as opposed to risk reduction, which is better addressed through systematic and episodic rebalancing) might want to "outsource" this to so-called "global macro" fund managers who they believe to be skilled in this area. For example, ninety five percent of a portfolio might be divided between broad asset classes and a long-term allocation to uncorrelated alpha strategies; the remaining five percent might be allocated to a global macro or so-called tactical asset allocation fund (provided, of course, that said fund employed a wide range of asset classes, and not just domestic debt and equity).

It is with these considerations in mind that we call our readers' attention to a number of interesting recent product launches. As noted above, Canadian investors will soon have access to carbon emissions credits, which (as we noted in our November 2006 issue), have the potential to become an interesting new asset class. Another new product that caught our eye was the Bearlinx Alerian MLP Select Index Exchange Traded Note (ticker BSR) that was launched in July. We wrote about the Alerian MLP Index in our December, 2006 issue, and concluded that since natural/geologic processes (e.g., oil and gas field depletion) were a key component of many MLPs, it could provide attractive diversification benefits to a portfolio (we also noted the caveat that the overall amount of MLPs outstanding was quite small in comparison to the major asset classes, and the cost of access might therefore be prohibitive). The new ETN has an expense ratio of only .85%, which makes it attractive. On the negative side, the issuer is Bear Stearns, which, as evidenced by its recent bailout of two of its subprime mortgage focused hedge funds, presents an investor with a non-trivial amount of credit risk. Bottom line: nice product, questionable issuer.

Another product that caught our attention was a new family of ETNs called Elements Spectrum (www.elementsetn.com) launched by Nuveen Invesetments, Merrill Lynch, BNP Paribas, and Swedish Export Credit Corporation (which is the ETN issuer, and which has a strong credit rating). Thus far, they have launched three products. Two ETNs track the

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metals (ECX) and energy (ECT) subsegments of the Rogers International Commodities Index (RICI). We have often made the point that from our perspective, the best commodities index product is one that equally weights exposure to three groups whose returns usually have low correlations with each other – energy, metals, and agricultural products. In terms of broad indexes, the DowJones AIG Commodities Index comes closes to this ideal. However, the introduction of subsegment commodity index products (e.g., by ETF Securities in the U.K. and Europe, or PowerShares in the United States) enables an investor to achieve an even better balanced (though at the cost of more time spent rebalancing between them). In this regard, the new Elements ETNs are effectively more of the same. More interesting, though perhaps not for the right reason, is the Elements Momentum Index ETN (EEH). Its goal is to generate superior risk adjusted returns by using technical trading rules to shift investments between large cap stocks (to keep down trading costs) in different market sectors – to put it differently, this is a sector market timing active management strategy nicely tarted up as an index fund. As noted above, the efficacy of technical trading rules is highly questionable. Moreover, if it turns out that this fund has one that works, what is to stop others from, at some point in the future, using a bit of regression to infer what the rule is (from changes in the ETN's investment holdings) and then copying it? Bottom line: Swedish Export Credit is an attractive ETN issuer; too bad about the product design.

On another front, investors in the U.S. now have a wider variety of funds to choose from to gain exposure to non-U.S. commercial property (real estate). In the beginning, there were actively managed funds from Cohen and Steers (IRFAX) and Fidelity (FIREX). Then came the first index product, State Street's SPDR Dow Jones International Real Estate ETF (RWX), which rapidly accumulated over $1 billion in assets. Now there are two more index offerings, one from Barclays Global Investors (iShares S&P World ex U.S. Property Fund, ticker WPS), and an expense ratio of .48% compared to the SPDR's .60%, , and the Wisdom Tree International Real Estate Fund (DRW) with an expense ratio of .58%. While the State Street and BGI products use market capitalization weighting, the Wisdom Tree fund, in keeping with the firm's fundamental indexing approach, weights its holdings by their respective dividend yields.

Speaking of real estate, earlier this year, BGI (iShares) launched three new ETF products in the United States based on the industrial/office (FIO), residential (REZ), and retail

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(RTL) subsegments of the broad FTSE NAREIT index. Presumably, part of the logic for these new products was to make it easier for investors to implement sector rotation strategies within the domestic property asset class, on the assumption that the returns on different sectors would have low correlation with each other, and would vary differently over the economic cycle. So far, a quick look at these three products' price history will show you that this theory hasn't quite panned out, with macro factors that affect the broad real estate asset class seeming to overwhelm any segment factors that are at work.

Another fund that has caught our interest is Affiliated Managers' Group First Quadrant Global Alternatives Fund (MGAAX; 5.75% load, 2.50% annual expenses). This fund was launched last year and is managed by First Quadrant, a Pasadena based boutique investment manager that specializes in global macro strategies. After more than a year of performance history, we were curious about how it compared with the Pimco All Asset Fund (PASAX, 3.75% load – thought the C shares can often be obtained without a load through some fund supermarket programs – and .84% annual expenses), which also employs a global macro like approach and is managed by Rob Arnott, another well know Pasadena based investment manager. So who owns the bragging rights at the local money manager watering hole? The following table shows the two funds' performance, measured on multiple dimensions, between the end of April 2006 and August 2007:

Performance Metric	**MGAAX**	**PASAX**
Average Monthly Return	.57%	.46%
Standard Deviation	1.89%	1.14%
Average/STD (return per unit of risk as measured by STD)	.30	.40
Skewness of Returns (Positive is better)	.25	.16
Kurtosis of Returns (negative indicates a more peaked distribution, with a lower probability of extreme returns)	(.81)	(1.17)

On a return per unit of risk as measured by standard deviation, PASAX is the winner. However, standard deviation is a problematic measure of risk, as it gives equal weight to returns above and below the average and also (to the extent it is assumed to be a valid risk

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measure) assumes that returns are normally distributed, with zero skewness (a measure of a distribution's symmetry around its mean) and kurtosis (a measure of a distribution's peakedness relative to the normal distribution, and the likelihood of experiencing extreme returns). In this case, both MGAAX and PASAX show evidence of being managed by very skilled investment managers, with positive returns more likely than negative ones, and a relatively low likelihood of extreme returns. However, given the difference in costs, on balance we still prefer PASAX as a global macro product for retail investors.

Pension Plan Design and Retirement Saving Adequacy

Two recent research papers make important points about the effects of pension plan design. The first is from the Reserve Bank of Australia. As frequent readers know, we are big fans of the way Australia – unlike other developed countries – has found solutions to two of the biggest problems confronting governments today: how to fund health care and retirement income security. In the latter area, individual investment in defined contribution pension plans (known as Superannuation Funds) is mandatory. Up to now, a critical question has been whether these mandatory contributions would reduce voluntary savings by individuals. In "The effect of the Australian Superannuation Guarantee on Household Saving Behavior", Ellis Connolly concludes that rather than falling, voluntary savings has increased slightly since superannuation plans were introduced.

The second paper examines a particular U.S. experience, where individuals (in this case, college professors) have both a traditional defined benefit pension plan (to which both they and their employers contribute) and a defined contribution plan. In "Pension Plan Characteristics and Framing Effects in Employee Savings Behavior", Card and Ransom find that "each additional dollar of mandatory employee contribution to the defined benefit plan led to a $.70 reduction in contribution to the defined contribution plan…[In contrast], each additional dollar of employer contribution to the defined benefit plan reduced employee contribution to the defined contribution plan by only $.30."

Pension plan design, while a bit of a dry subject for some, is in fact a critical issue, as evidenced by two new reports. The first is from the Center for Retirement Research at Boston College. In their paper "Is There Really a Retirement Savings Crisis?", Munnell, Webb and

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Golub-Sass effectively criticize a number of recent articles that have concluded that America's retirement savings crisis might not be as severe as first thought. The authors note that the percentage of people whose retirement income adequacy (measured as a percentage of preretirement income) is at risk is substantially increased when "realistic assumptions about earlier retirement, reluctance to annuitize 401k balances or tap housing equity, and the impact of increasing longevity and rapidly rising health care costs" are included in the analysis. They conclude that the percentage of savers at risk of falling short of acceptable post-retirement income goals rises as age declines; while only 35% of "early boomers" (born between 1946 and 1954) are at risk, 49% of Generation Xers (1965 to 1972) are in this category, rising to 60% of GenXers in the bottom third of income. Very similar conclusions are found in the second paper, which looks at retirement savings adequacy in the U.K. In "There's No time Like the Present: The Cost of Delaying Retirement Saving", Byrne, Blake, Cairns and Dowd perform a stochastic simulation analysis and find that " the levels of [pension] contributions required for individuals who start saving late are so high it is questionable whether they are affordable for anyone not on a high income."

With so much at stake, it is no surprise that much political capital is being spent on both sides of the Atlantic this year by varying interest groups clashing over the proper default asset allocation in defined contribution pension plans. In the U.K. Byrne, Harrison and Blake have produced an excellent report for the Pensions Institute on this issue. In "Dealing With the Reluctant Investor: Innovation and Governance in Defined Contribution Pension Investment" they begin by noting that a very high percentage of plan members choose the default asset allocation. From a governance point of view, this raises some interesting issues, in that while plan participants may believe that plan sponsors have a fiduciary responsibility to choose the optimal default allocation, this is not the case in law. The report also finds that while most plans offer too many fund choices (a consequence of choosing providers, who then make a wide range of their funds available to the plan), many plan sponsors are reluctant to reduce the number of funds offered for fear of incurring liability if the selected funds do not perform as well in the future as those they have removed. The authors note the rising popularity of lifecyle and target date funds as default options, but also note that they may be inferior to "pre-packaged risk graded" strategies that employ a wider range of asset classes.

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This would also require better "safe harbour" rules to protect employers who fear the potential liability associated with anything that smacks of providing fiduciary advice.

The latter issue has already been addressed in the United States, where a range of interest groups are now clashing over the acceptable choices in the Labor Departments upcoming ruling on defined contribution plans' default asset allocation. The insurance industry is fighting tooth and nail to preserve the role of its products (so-called "stable value") funds in the default mix, even though these products provide very low returns and are ill-advised, in our view, for most investors. Meanwhile, the mutual fund industry has been fighting hard for the inclusion of so-called target retirement date or lifecycle funds as the default 401k allocation. As we have noted in the past, we have quite a few problems with these products, including the narrow range of asset classes most of them include, their heavy use of expensive actively managed funds, and their underlying asset allocation philosophy, which begins with a heavy allocation to equity and ends with a heavy allocation to money market funds, regardless of the minimum required real rate of return a given investor needs to earn to achieve his or her retirement savings or post-retirement income and bequest goals. From our perspective, too many of these products force naïve but trusting investors to take on too much risk on their way to a sharply lower post retirement standard of living. Put differently, we believe a lot of investors in these products may get one or more nasty surprises from them in the future.

So what would we do differently? First, we'd adopt an Australian style mandatory defined contribution plan system. Second, we'd set our default asset allocation within these plans to an equally weighted mix of broadly defined asset classes. If history is any guide (and, as we all know, sometimes it isn't) this mix could reasonably be expected to produce a compound real return of between 4% and 6% per year. Third, we would implement this allocation via low cost index funds, similar to the approach used by the Thrift Savings Plan available to U.S. Federal Government employees. Fourth, we would restrict the availability of actively managed products in the plan to (a) a maximum percentage of total assets, and (b) funds with returns that are expected to have a low correlation with returns on the broad asset class index funds. Finally, we would provide user friendly tools that would enable investors to adjust the default asset allocation to reflect differences in individual goals (and required

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portfolio returns) and risk preferences. Unfortunately, we're not holding our breath waiting for the U.S. Congress to adopt such a common sense plan.

Last but not least, we just have to mention one more new product launch. The DWS Scudder Alternative Asset Allocation Plus Fund (AAAAX) "is designed to be a simple solution that gives the average mutual fund investor access to components of what [its sponsor] believes are some of the best alternative ideas, through one easily accessible strategy." The fund "gives shareholders access to non-traditional or "alternative" asset categories and investment strategies such as market neutral, inflation-protection, commodities, real estate, and emerging markets bonds and equity." Scudder's press release notes that the fund "offers the potential for adding return and minimizing risk through investing in a diversified set of asset classes that are largely uncorrelated to the core U.S. equity and bond markets." And all this for the bargain price of a 5.75% front end load (sales commission) and annual expenses of 1.90% per year. Think about that. For an investment of $50,000, the front end load would be $2,875, and the annual fee (on the money left to invest after paying the load) would be $895 the first year, for a total cost of $3,770. Makes $59 a year for The Index Investor look like a quite a good deal, don't you think?

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

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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 2007, our Pounds Sterling cash benchmark is 5.30% (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 can be found here:

http://www.indexinvestor.com/Members/YTDReturns/UK.php

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