

# The Index Investor

*Invest Wisely...Get an Impartial Second Opinion.*

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## This Month's Issue: Key Points

This month's issue contains our latest quarterly economic update. We review the latest forecasts from the OECD and IMF, and find that they are in line with our own conclusion that downside risks in the world economy continue to increase. We then ask "what is the most critical and uncertain assumption underlying our scenario?" We conclude that it is our belief that the Chinese economy will not experience a sharp rise in consumption spending to offset the fall we expect in U.S. demand. We then explore in more depth whether this assumption is warranted by the available evidence, and conclude that it most likely is. So what does all this mean for financial markets and asset class valuations and returns? We do not believe that the average investor has yet grasped the gravity of the situation facing the world economy. There are likely to be more psychological shocks ahead, as investors' perceptions catch up with reality and their uncertainty increases. This should lead to falls in the value of many asset classes.

Our second article this month starts with three research papers that conclude that skilled individual investors exist, who can consistently deliver risk adjusted returns above a comparable index (although the usual magnitude of that outperformance doesn't appear to be large). We review other research that points towards how these investors are likely achieving these results. As always, the real challenges lies not in beating the index once; rather, in doing this consistently and scaling up the approach being used as the amount of investable funds grows larger. We still believe that this is beyond the reach of most investors, and that holding a well diversified portfolio of broadly defined asset class index funds remains the most prudent investment advice. This month's product and strategy notes celebrate the (better late but never) arrival of the first international bond ETF in the United States, review new research on commercial property as an asset class and a new comparison of DFA and Vanguard funds, and highlight two interesting pieces of research about this summer's credit market shocks.

### **This Month's Letter to the Editor**

*Why just Plum Creek and Rayonier rather than a whole bunch of timber stocks? Also, when it comes to growth rates, wouldn't tropical (or at least non-boreal) plantations have an edge over our over-indulged, over-entitled Canadian forest managers?*

You make two good points, about which reasonable people can disagree. We have focused on PCL and RYN for our timber allocation because they are both so-called "timber REITS", which is a liquid tax efficient structure for a retail investment in timber. We also like these two offerings because both companies have focused more and more on managing their timber assets while shedding other operations (though this is truer of PCL than RYN). This certainly does not mean that, in other parts of the world, there are also other publicly traded companies that offer similarly focused exposure to timberland, nor that they should not be included in an investor's portfolio. On the second point, we take your point about the relatively faster natural growth rate of tropical timber relative to more northern or southerly regions, and the implication that, if possible, a mix of regions should be included in an investor's allocation to timberland. Unfortunately, while some funds have been offered privately, we don't know of a

publicly traded asset that focuses on tropical timber. If and when such an asset becomes available, we will certainly include it in our timber allocation.

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## Global Asset Class Returns

<b>YTD 28Sep07</b>	<b><u>In USD</u></b>	<b><u>In AUD</u></b>	<b><u>In CAD</u></b>	<b><u>In EURO</u></b>	<b><u>In JPY</u></b>	<b><u>In GBP</u></b>	<b><u>In CHF</u></b>	<b><u>In INR</u></b>
Asset Held								
<b>US Bonds</b>	3.69%	-8.40%	-13.64%	-4.04%	0.22%	2.68%	-0.65%	-7.01%
<b>US Prop</b>	-4.09%	-16.18%	-21.42%	-11.82%	-7.56%	-5.10%	-8.43%	-14.79%
<b>US Equity</b>	9.10%	-2.99%	-8.23%	1.37%	5.63%	8.09%	4.76%	-1.60%
<b>AUS Bonds</b>	10.13%	-1.96%	-7.20%	2.40%	6.66%	9.13%	5.80%	-0.57%
<b>AUS Prop</b>	16.34%	4.25%	-0.99%	8.61%	12.87%	15.34%	12.00%	5.64%
<b>AUS Equity</b>	35.28%	23.18%	17.94%	27.54%	31.80%	34.27%	30.94%	24.58%
<b>CAN Bonds</b>	14.96%	2.87%	-2.37%	7.23%	11.49%	13.96%	10.63%	4.26%
<b>CAN Prop</b>	20.88%	8.79%	3.55%	13.15%	17.41%	19.87%	16.54%	10.18%
<b>CAN Equity</b>	31.82%	19.72%	14.48%	24.08%	28.34%	30.81%	27.48%	21.11%
<b>Euro Bonds</b>	3.96%	-8.13%	-13.37%	-3.77%	0.49%	2.96%	-0.37%	-6.74%
<b>Euro Prop.</b>	-7.47%	-19.57%	-24.81%	-15.20%	-10.95%	-8.48%	-11.81%	-18.17%
<b>Euro Equity</b>	16.98%	4.89%	-0.35%	9.25%	13.51%	15.97%	12.64%	6.28%
<b>Japan Bnds</b>	3.38%	-8.72%	-13.96%	-4.36%	-0.10%	2.37%	-0.96%	-7.32%
<b>Japan Prop</b>	9.13%	-2.96%	-8.20%	1.40%	5.66%	8.12%	4.79%	-1.57%
<b>Japan Eqty</b>	0.91%	-11.18%	-16.42%	-6.82%	-2.56%	-0.09%	-3.42%	-9.79%
<b>UK Bonds</b>	-1.35%	-13.44%	-18.68%	-9.08%	-4.82%	-2.35%	-5.69%	-12.05%
<b>UK Prop.</b>	-24.44%	-36.53%	-41.77%	-32.17%	-27.91%	-25.45%	-28.78%	-35.14%
<b>UK Equity</b>	9.91%	-2.18%	-7.42%	2.18%	6.44%	8.90%	5.57%	-0.79%
<b>World Bnds</b>	5.30%	-6.80%	-12.04%	-2.44%	1.82%	4.29%	0.96%	-5.41%
<b>World Prop.</b>	3.04%	-9.05%	-14.29%	-4.69%	-0.43%	2.03%	-1.30%	-7.66%
<b>World Eqty</b>	13.04%	0.95%	-4.29%	5.31%	9.57%	12.03%	8.70%	2.34%
<b>Commod</b>	9.89%	-2.20%	-7.44%	2.16%	6.41%	8.88%	5.55%	-0.81%
<b>Timber</b>	17.00%	4.90%	-0.34%	9.27%	13.52%	15.99%	12.66%	6.30%
<b>EqMktNtrl</b>	3.22%	-8.87%	-14.11%	-4.51%	-0.25%	2.22%	-1.11%	-7.48%
<b>Volatility</b>	55.71%	43.62%	38.37%	47.98%	52.23%	54.70%	51.37%	45.01%
<b>Currency</b>								
<b>AUD</b>	12.09%	0.00%	-5.24%	4.36%	8.62%	11.09%	7.76%	1.39%
<b>CAD</b>	17.33%	5.24%	0.00%	9.60%	13.86%	16.33%	13.00%	6.63%
<b>EUR</b>	7.73%	-4.36%	-9.60%	0.00%	4.26%	6.73%	3.39%	-2.97%
<b>JPY</b>	3.47%	-8.62%	-13.86%	-4.26%	0.00%	2.47%	-0.86%	-7.23%
<b>GBP</b>	1.01%	-11.09%	-16.33%	-6.73%	-2.47%	0.00%	-3.33%	-9.70%
<b>USD</b>	0.00%	-12.09%	-17.33%	-7.73%	-3.47%	-1.01%	-4.34%	-10.70%
<b>CHF</b>	4.34%	-7.76%	-13.00%	-3.39%	0.86%	3.33%	0.00%	-6.36%
<b>INR</b>	10.70%	-1.39%	-6.63%	2.97%	7.23%	9.70%	6.36%	0.00%

## Asset Class Valuation Update

Our market valuation analyses are based on the assumption that markets are not perfectly efficient and always in equilibrium. This means that it is possible for the supply of future returns a market is expected to provide to be higher or lower than the returns investors logically demand. In the case of an equity market, we define the future supply of returns to be equal to the current dividend yield plus the rate at which dividends are expected to grow in the future. We define the return investors demand as the current yield on real return government bonds plus an equity market risk premium. As described in our May, 2005 issue, people can and do disagree about the “right” values for these variables. Recognizing this, we present four valuation scenarios for an equity market, based on different values for three key variables. First, we use both the current dividend yield and the dividend yield adjusted upward by .50% to reflect share repurchases. Second, we define future dividend growth to be equal to the long-term rate of total (multifactor) productivity growth. 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  $(\text{Current Dividend Yield} \times 100) \times (1 + \text{Forecast Productivity Growth})$  divided by  $(\text{Current Yield on Real Return Bonds} + \text{Equity Risk Premium} - \text{Forecast Productivity Growth})$ . Our valuation estimates are shown in the following tables, where a value greater than 100% implies overvaluation, and less than 100% implies undervaluation. 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 28 September 07*

<i>Australia</i>	<b>Low Demanded Return</b>	<b>High Demanded Return</b>
<b>High Supplied Return</b>	81%	119%
<b>Low Supplied Return</b>	123%	167%

<i>Canada</i>	<b>Low Demanded Return</b>	<b>High Demanded Return</b>
<b>High Supplied Return</b>	116%	183%
<b>Low Supplied Return</b>	209%	297%

<i>Eurozone</i>	<b>Low Demanded Return</b>	<b>High Demanded Return</b>
<b>High Supplied Return</b>	82%	127%
<b>Low Supplied Return</b>	133%	186%

<i>Japan</i>	<b>Low Demanded Return</b>	<b>High Demanded Return</b>
<b>High Supplied Return</b>	99%	185%
<b>Low Supplied Return</b>	224%	348%

<i>United Kingdom</i>	<b>Low Demanded Return</b>	<b>High Demanded Return</b>
<b>High Supplied Return</b>	54%	97%
<b>Low Supplied Return</b>	98%	149%

<i>United States</i>	<b>Low Demanded Return</b>	<b>High Demanded Return</b>
<b>High Supplied Return</b>	123%	190%
<b>Low Supplied Return</b>	219%	307%

<i>Switzerland</i>	<b>Low Demanded Return</b>	<b>High Demanded Return</b>
<b>High Supplied Return</b>	102%	155%
<b>Low Supplied Return</b>	169%	316%

<i>India</i>	<b>Low Demanded Return</b>	<b>High Demanded Return</b>
<b>High Supplied Return</b>	109%	206%
<b>Low Supplied Return</b>	264%	411%

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 28Sep07*

	<b>Current Real Rate</b>	<b>Average Inflation Premium (89-03)</b>	<b>Required Nominal Return</b>	<b>Nominal Return Supplied (10 year Govt)</b>	<b>Return Gap</b>	<b>Asset Class Over or (Under) Valuation, based on 10 year zero</b>
Australia	2.73%	2.96%	5.69%	6.16%	0.47%	-4.33%
Canada	2.10%	2.40%	4.50%	4.34%	-0.16%	1.51%
Eurozone	2.26%	2.37%	4.63%	4.35%	-0.28%	2.75%
Japan	1.22%	0.77%	1.99%	1.68%	-0.31%	3.04%
UK	1.38%	3.17%	4.55%	5.04%	0.49%	-4.60%
USA	2.27%	2.93%	5.20%	4.58%	-0.62%	6.04%
Switz.	2.42%	2.03%	4.45%	3.02%	-1.43%	14.78%
India	2.19%	7.57%	9.76%	7.89%	-1.87%	18.75%

\*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 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. 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 28Sep07***

<b>Real Rate Analysis</b>	AUD	CAD	EUR	JPY	GBP	USD
Risk Aversion Factor	3.5	4.0	4.0	6.0	5.5	4.0
Time Discount Rate	2.00%	1.75%	1.75%	0.75%	1.00%	1.75%
MFP Growth	1.60%	1.20%	1.40%	0.60%	1.40%	1.40%
Theoretical Real Rate	2.46%	2.05%	2.10%	0.85%	1.25%	2.10%
Real Rate	2.73%	2.10%	2.26%	1.22%	1.38%	2.27%

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 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).

	<b>AAA – 10 Year Treasury</b>	<b>BBB-AAA</b>
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 28 September 2007, the AAA minus 10 year Treasury spread was 1.22%. 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 .85%. 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:

**Annual Exchange Rate Changes Implied by Bond Market Yields on 28Sep07**

	To AUD	To CAD	To EUR	To JPY	To GBP	To USD	To CHF	To INR
From								
<b>AUD</b>	0.00%	-1.82%	-1.81%	-4.48%	-1.12%	-1.58%	-3.14%	1.73%
<b>CAD</b>	1.82%	0.00%	0.01%	-2.66%	0.70%	0.24%	-1.32%	3.55%
<b>EUR</b>	1.81%	-0.01%	0.00%	-2.67%	0.69%	0.23%	-1.33%	3.54%
<b>JPY</b>	4.48%	2.66%	2.67%	0.00%	3.36%	2.90%	1.34%	6.21%
<b>GBP</b>	1.12%	-0.70%	-0.69%	-3.36%	0.00%	-0.46%	-2.02%	2.85%
<b>USD</b>	1.58%	-0.24%	-0.23%	-2.90%	0.46%	0.00%	-1.56%	3.31%
<b>CHF</b>	3.14%	1.32%	1.33%	-1.34%	2.02%	1.56%	0.00%	4.87%
<b>INR</b>	-1.73%	-3.55%	-3.54%	-6.21%	-2.85%	-3.31%	-4.87%	0.00%

Our approach to valuing commercial property securities as an asset class is hindered by a lack of historical data about rates of dividend growth. To overcome this limitation, we have assumed that markets are fairly valued today (i.e., the expected supply of returns equals the expected returns demanded by investors), and “backed out” the implied 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:

**Commercial Property Securities Analysis as of 28Sep07**

<b>Country</b>	<b>Real Bond Yield</b>	<b>Plus Commercial Property Risk Premium</b>	<b>Less Dividend Yield on Commercial Property Securities</b>	<b>Equals Implied Rate of Future Real Dividend Growth</b>
Australia	2.73%	2.50%	5.4%	-0.2%
Canada	2.10%	2.50%	4.3%	0.3%
Eurozone	2.26%	2.50%	3.1%	1.6%
Japan	1.22%	2.50%	1.5%	2.2%
Switzerland	2.42%	2.50%	3.9%	1.1%
United Kingdom	1.38%	2.50%	2.4%	1.5%
United States	2.27%	2.50%	4.3%	0.5%

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 28 September 2007 closing value of 178.25 was more than three 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

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:

<b>Growth Driver</b>	<b>Assumption</b>
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

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 28 September 2007 is as follows:

1. Forecast supplied return = 4.00% (Div Yld) + 6.00% (Long Term Growth) = 10.00%
2. Return demanded = 2.27% (Real Bond Yield) + 4.00% (Risk Premium) = 6.27%
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 28 September 2007, the VIX closed at 18.00. This is .2 standard deviation below the VIX's long-term average value. We believe this level is too low in light

of rising uncertainty in the world economy and 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 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.

**Three Month Rolling Nominal Returns on Classic Rotation Strategies in the U.S. Markets**Rolling 3 Month  
Returns Through

28Sep07

<b>Economy</b>	Bottoming	Strengthening	Peaking	Weakening
<b>Interest Rates</b>	Falling	Bottom	Rising	Peak
<b>Style and Size Rotation</b>	Small Growth (DSG) <b>-0.51%</b>	Small Value (DSV) <b>-4.62%</b>	Large Value (ELV) <b>0.74%</b>	Large Growth (ELG) <b>3.38%</b>
<b>Sector Rotation</b>	Cyclicals (IYC) <b>-3.30%</b> Technology (IYW) <b>5.56%</b>	Basic Materials (IYM) <b>5.94%</b> Industrials (IYJ) <b>3.27%</b>	Energy (IYE) <b>9.02%</b> Staples (IYK) <b>3.05%</b>	Utilities (IDU) <b>1.25%</b> Financials (IYF) <b>-4.37%</b>
<b>Bond Market Rotation</b>	Higher Risk (LQD) <b>2.26%</b>	Short Maturity (SHY) <b>2.51%</b>	Low Risk (TIP) <b>5.04%</b>	Long Maturity (TLT) <b>5.38%</b>

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

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

## Economic Update

Does the fact that no severe earthquake has occurred in San Francisco since 1906 prove that one won't happen? Of course not; there is objective data that tensions are building along key fault lines in the Bay Area, which occasional small tremors fail to completely reverse. When it comes to this crisis, the real question is when, not if. No doubt, all this seems quite logical to most of our readers. But now let's turn to the world political economy and financial markets. Does the fact that no severe downturn has occurred in the world economy since the 1930s prove that one won't happen? And are the tensions that could cause such a downturn getting more or less acute? The rapidity with which prices in most asset classes have recovered from the tremors of August is nothing short of stunning. It is almost as if many investors have taken the apparent ability of the world's central banks and finance ministries to stop this incipient crisis in its tracks as proof that severe, prolonged crises can no longer occur. Unfortunately, there continues to be abundant evidence that this view is dead wrong.

On the macroeconomic front, the last month saw the release of the OECD's economic outlook, and the IMF's Global Financial Stability Report (the IMF's World Economic Outlook will be released later this month). Following this summer's credit crises, the OECD concludes that OECD growth "prospects going forward are now clearly less buoyant and more uncertain. Downside risks have become more ominous, in a context where overall financial market conditions are likely to remain durably tighter." If anything, the report's authors believe that the OECD's reduced "growth estimates may err on the upside, since it has not yet been possible to fully evaluate the negative impact of credit market turbulence on economic activity."

In the GFSR, the IMF notes that "following an extended period of exceptionally favorable financial market conditions, international markets have entered a difficult period. The current episode of turbulence represents the first significant test of several categories of innovative financial instruments used to distribute credit risks broadly. Although the dislocations, especially to short term funding markets have been large and in some cases unexpected, they hit during a period of above average global growth. Credit repricing and the constriction of liquidity experienced to date will likely slow the global expansion...What began as a deterioration in credit quality altered the market liquidity of a number of structured

credit products. Market illiquidity in turn produced uncertainty about those products' valuations, which translated into a disruption of the underlying funding markets....The adjustment period is continuing, and, if the intermediation process stalls and financial conditions deteriorate further, the global financial sector and real economy could experience more serious negative repercussions...Despite the continued strength of emerging market economies, global macroeconomic risks have generally increased. The downside risks [to the IMF's baseline scenario] are mainly related to the knock-on effects of potentially weaker U.S. demand due to changes in financial risks and market conditions, and secondarily to a potential spike in global inflation, which would be lessened under a scenario of slower global growth. A disorderly unwinding of global imbalances is also still a risk, particularly if foreign investors' preferences for U.S. assets were to diminish as a result of turmoil in financial markets."

In sum, the tensions along major fault lines in the world economy continue to increase. Yet, as is true of every complex adaptive system, accurate prediction of when and how these tensions will be released is made extremely difficult by the separation in time and often non-linear relationship between causes and effects. We are still left with the challenge of making investment decisions (which will be judged with perfect hindsight) with the aid of highly uncertain foresight. Our approach to this problem is first to state our most likely scenario, then assume it has turned out wrong and use "prospective hindsight" to identify our most important wrong assumption.

Our base case scenario has not been altered by recent events. We have long stated our belief that overleveraged U.S. consumers could not continue to support the world economy forever, and that when their spending inevitably fell (say because of a sharp fall in housing values) it would trigger a substantial drop in global demand and potentially prices (i.e., deflation). In turn, this could worsen tensions along two critical fault lines, which we have characterized as the growing frustration of the U.S. middle class and Chinese peasants with their worsening (in the relative sense) lot in life. In our view, the first contains within it seeds of increased protectionism and renewed inflation (e.g., we believe that U.S. political leaders will prefer to sacrifice the interests of nominal bondholders to preserve the economic security of the U.S. middle class). Given the Chinese economy's profound dependence on investment spending and export sales, as well as its growing urban/rural inequalities and history of revolts

against the center, a sharp fall in global demand could trigger a prolonged period of disruption, not just in China, but across the world's highly integrated supply chains. For example, the World Bank's September 2007 China Quarterly Update estimated that, given the current structure of its economy, China's GDP would fall by .5% for every 1% fall in U.S. consumption.

In addition to these two fault lines, we have also noted the potential downside impact of two "wild cards" – the growing tension in Iran between the confrontational policies being pursued by President Ahmadinejad and the aspirations of the nation's large number of young people, and the unpredictable evolution of the H5N1 highly pathogenic avian influenza virus.

Now let us assume that we are looking back at this prediction from some point in the future, and it has been proved wrong. What underlying assumptions are most likely to turn out to be both critical in terms of their potential impact, and incorrect? Obviously, there are many potential answers to this question. However, we believe that by far the most important is the assumption that China will not be able to maintain its aggregate demand growth (and therefore the health of the world economy) by substantially increasing consumption spending as cutbacks by U.S. consumers lead to a sharp fall in its exports. This is our most likely candidate for the assumption that has been used by the world's central bankers, as they have replaced private investors as the main source for financing the U.S. current account deficit – in our view, they are trying to buy time to enable China to implement this change. How likely is it that their bet will pay off?

As we have previously discussed at length (see our March 2004 issue), China's rapid growth in recent years has created its own set of building tensions. A World Bank report found that 750,000 people per year die prematurely in China as a result of environmental pollution. Combine that with the legacy of China's "one child" population control policy and it is easy to understand how the severe environmental consequences of China's rapid growth have created a potential powderkeg.

China's financial system also contains an impressive array of unresolved problems. These include building bubbles in Chinese equity and property markets (whose collapse would fall most heavily on China's growing middle class), an underdeveloped bond market, and an unknown yet thought to be very large volume of non-performing and under-performing loans on the balance sheets of its state owned banks (whose assets equal about

150% of Chinese GDP). It is estimated that over 60% of these banks' loans have gone to state owned enterprises, with many of them used to either rollover non-performing loans or finance investment. It has been widely asserted that many of these loans are made on the basis of political rather than investment analysis, leading to substantial overinvestment and overcapacity in many segments of China's economy (whose impact on enterprise profitability is masked by – you guessed it – more loans). Any slowdown in China's growth rate could therefore lead to a sharp increase in domestic credit problems, which would act to accelerate the decline.

Yet another fault line is the sharp increase in economic inequality within China in recent years (see, for example, "Inequality in Asia" by the Asian Development Bank). Not only is inequality worse in China than in most other Asian countries, but it has also been worsening at a faster pace). The frustrations this engenders are only exacerbated by widespread corruption among government officials ("crony communism" is one wag's description of the situation), and a weak system of property and contract law. Indeed, as the Financial Times recently noted, "the old Chinese saying about the limited writ of the central government – shan gao, huang di yuan ("the mountains are high, and the emperor is far away") – is as relevant today as it ever was." However, balanced against growing rural resentment is the increasing conservatism of the burgeoning middle class that has greatly benefited from the Chinese economy's rapid expansion in recent years. Yet if that growth were to falter, frustrated expectations might cause this conservatism to quickly morph into something more dangerous.

While the environmental, financial and political problems it faces are undoubtedly daunting, the most dangerous issue in China today may be the increasing disconnect between its rate of economic expansion and its rate of job creation and household income growth. For the past few years, China's growth rate has not translated into equivalent employment gains. At a time when it has been estimated that more than 50% of Chinese youth are attending college, this is a recipe for trouble. As the Economist recently noted, consumer spending in China has fallen from 47% of GDP in the early 90s to only 36% in 2006, "the lowest proportion of any large economy" (at the other end of the spectrum, U.S. consumer spending accounts for about 70% of that country's GDP). A recent IMF working paper ("Explaining China's Low Consumption: The Neglected Role of Household Income" by Aziz and Cui)

analyzed the underlying causes of this result. In contrast to previous analyses, they found that an increase in China's household savings rate was not responsible for the decline in consumption's share of GDP. While China's household saving rate has indeed increased (e.g., due to more precautionary savings in the face of the one child policy and poor government health care and retirement income security programs), "the rise in the household savings rate of 5% since the early 1990s can explain only 1% of the 9% decline in the share of consumption in GDP that has occurred since then." The authors note that "during this same period, household income as a share of GDP declined by 8% -- this is the proverbial elephant in the room."

One possible explanation for this is that surplus labor held down wages well below the rate of labor productivity growth. However, the authors reject this argument, noting, "the problem is that while wage rates may be kept low by an increase in labor supply, it is hard to see why employment growth could not have been faster to prevent the decline in wages as a share of GDP." Instead, the authors conclude that "the persistent and rising difficulty for average firms to obtain financing has played a major role in explaining the co-movements in employment, household income and consumption over the last two decades. Specifically, Chinese firms rely on bank financing for working capital to pay wages and other current expenditures. Under these circumstances, credit restraints [which the government has imposed to limit the impact of its current account surpluses as well as to reduce the growth in investment spending] act like taxes that discourage the use of labor." The authors also note that "the declining share of wage income in GDP would not have led to such a steep fall in household income share if rising firm profits were distributed to households. This did not happen in China for several reasons," including weak capital markets, weak corporate governance and protection of minority shareholder rights, low interest rates paid by state owned banks (at least in part due to their large percentage of non-performing loans) and the fact that state owned enterprises (SOEs) do not pay dividends to the government (which could have been used to increase spending on health care and pensions).

Another paper by two World Bank economists ("How Will China's Savings-Investment Balance Evolve?" by Kuijs and He) makes similar points, and adds China's very low cost of capital to SOEs (which stimulates capital rather than labor intensive production)

and tax disincentives to the growth of service industries as additional causes of the slow rate of employment growth.

What then, are the chances that China will be able to shift a substantial portion of its economic demand from exports to consumption, in time to eliminate most of the negative effects from what seems likely to be an accelerating decline in U.S. consumption spending in the months ahead? Clearly, the policy changes that would be required are many and challenging. They are made doubly so by the tenuous hold that the central government has on provincial bureaucrats, the weak rule of law, and the inherent conservatism of the Chinese Communist Party, that is currently in the throes of determining who will succeed President Hu Jintao in 2012. On balance, we are not betting that these changes will be made in time to forestall the development of our most likely economic scenario. That being said, an aggressive move by the Chinese leadership to implement new pension and healthcare plans funded by SOE dividends would cause us to reexamine this conclusion.

So what does all this mean for financial markets and asset class valuations and returns? We do not believe that the average investor has yet grasped the gravity of the situation facing the world economy. In the aviation world, situational awareness is described in terms of three levels of increasing insight. At level one, a pilot pays attention to the most important factors affecting his situation; at level two, he or she understands how they are related, and what they mean today for the achievement of his or her objective; at the highest level, a pilot understands how these factors are likely to evolve in the future. We believe that the process is the same for investors, with the added complication that they are dealing with a complex system in which cause and effect are often separated by time and non-linear in their relationship. Under these circumstances, it isn't hard to believe that the perceptions of the average investor continue to lag well beyond the evolution of economic reality (a situation that has only been compounded by the fast termination of August's crisis and return to record setting levels for many equity indexes).

On the other hand, we also believe that there are many smart investors whose view of the current situation is quite similar to our own. A logical question is why they are still in the game. Our glib answer is "2% of the assets under management and 20% of the profits" – we cynically believe that there are a lot of fund managers out there hoping that average perceptions lag their own long enough to allow them to collect a big 2007 bonus, put the

money in government bonds and start applying for teaching positions before everything goes to hell.

At a more granular level, here are our views on the broad asset classes we follow at the start of October, 2007:

Asset Class	Summary Outlook
Real Return Government Bonds	A fall in global GDP and uncertainty about inflation should lead to greater demand for these instruments. Assuming this demand is not fully offset by an increase in supply, yields should fall and prices increase. On balance, we prefer higher yielding issues from Australia and Canada (where governments have also done more to address underlying structural issues around healthcare and pension liabilities).
Nominal Return Government Bonds	We expect continued US dollar weakness, and prefer issues from other countries (again, we favor Australia and Canada for the reasons noted above). That said, also expect that a sharp fall in global demand will induce a flight to quality, a fall in government bond yields and a rise in prices. However, in light of our concerns about the potential for a deflation/inflation whipsaw, we would not be inclined to go out beyond a five year maturity.
Commercial Property	Across all the markets we follow, current valuations and dividend yields appear to imply expected future real dividend growth rates that seem too high, at least in for the next few years. We regard this asset class as overvalued today.
Commodities	In light of our expectation for falling demand in the future, we regard commodity prices as at or near their peaks; a possible exception to this is the case of some agricultural commodities, where the shift to biofuels should continue to support

Asset Class	Summary Outlook
	prices until new technologies (e.g., cellulose or algae based ethanol) or a reduction in trade barriers (Brazil's sugar based ethanol is more efficient) displace them.
Timber	While a fall in demand will cause a fall in timber prices, it will not affect the basic biological growth rate that is at the core of the return generating process for this asset class. We believe this asset class, particularly in liquid forms such as timber REITS, remains undervalued.
Equities	We believe equities are overvalued today in light of our outlook for falling growth rates and increases in risk and uncertainty aversion.
Market Neutral Strategies	Assuming the managers of these funds can in fact deliver on their promise of uncorrelated returns even in a downturn (which is clearly not guaranteed), we continue to support their inclusion in limited amounts (due to the difficulty of identifying skilled active managers) in most portfolios.
Equity Market Volatility	At current levels, we believe this is an undervalued asset class, and regret that it is not available to retail investors. In times of crisis – just look back at August – it provides a welcome cushion against sharp drawdowns in the value of other asset classes.

## How to Raise Your Chances of Beating the Index

Three recent papers have produced some interesting findings about the ability of some individual investors to persistently generate risk adjusted returns above those on an equity index. As we expect many of our readers to be hearing more about these papers in the future,

we thought it would be useful to review their findings and our take on the larger issues involved.

The first was published two years ago by Coval, Hirshleifer and Shumway. In “Can Individual Investors Beat the Market?”, the authors reviewed trading records from a U.S. discount brokerage firm. Specifically, they examine the trades placed by 115,856 accounts between January 1990 and November 1996. After sorting trader performance into deciles, they find that top and bottom performers tend to repeat over different periods, suggesting that some are able to consistently beat the market, while others have an equally consistent ability to be on the wrong side of winning trades. The top decile earns an average excess return (return on the stock less the risk free rate) of 19 basis points per day for the five days following its winning trades. On the other hand, the standard deviation of these excess returns is 1.51%, yielding an information ratio of .13 – not exactly overwhelming, but positive nonetheless.

The second study was published this August, by Che, Norli and Priestly. In “Performance Persistence of Individual Investors”, they examine a very unique dataset – “the portfolio holdings of all individuals who owned stocks traded on the Oslo Stock Exchange between January 1993 and June 2003.” Their “main finding is that individuals who have done well over the past two to five years outperform a passive benchmark for as long as the next three years.” However, the economic size and statistical significance of this outperformance varies considerably depending on the criterion used to identify traders in the top decile.

In the third paper (also published this year), Alok Kumar asks “Do the Diversification Choices of Individual Investors Affect Stock Returns?” He finds that they do. After examining six years of U.S. discount brokerage account data, he concludes that a portfolio that is long the stocks held by the least diversified investors and short stocks held by the most diversified investors generates annual risk adjusted returns of between 5% and 9%, though this gradually falls in the three years after the portfolio is formed.

So what we have here are three studies that reach similar conclusions: certain investors appear able to consistently deliver risk adjusted returns above those available on an equity index, though the economic significance of these alphas is open to question. This, of

course, raises the question of just what those top decile traders might be doing to achieve these results. A variety of research studies point to three broad factors that might be at work.

The first of these is that top traders' results might reflect their consistent access to superior information. Different hypotheses have been studied about where individual investors are likely to obtain valuable private information. For example, Ikovich and Weisbenner (in "Information Diffusions Effects in Individual Investors' Common Stock Purchases") found that "a ten percent increase in a neighbors' purchases of stock in a particular industry was associated with a two percent increase in stock purchases in the same industry by those living nearby." But was this likely to generate alpha? In "Is There Information in the Local Portfolio Choices of Individuals?", Seasholes and Zhu suggest that the answer is most likely no. They found that "there is simply no evidence that individuals have [valuable private] information about the local stocks in their portfolios." To put it differently, just because a company is located nearby does not mean anything you hear about it will automatically confer an information advantage when investing.

On the other hand, in "Portfolio Concentration and the Performance of Individual Investors," Ivkovich, Sialm and Weisbenner find that investors with concentrated portfolios tend to outperform investors with more diversified portfolios, at least on a returns basis. However, when the additional risk taken on as a result of lower diversification was taken into account, their relative outperformance declined. A Dutch study, "The Performance and Persistence of Individual Investors" by Bauer, Cosemans and Eicholtz, reached a similar conclusion. Still, in both cases it would appear that some of the investors studied were trading on some type of private information that had some value relevance. The question was where did they get it?

A paper published earlier this year by Cohen, Frazzini and Malloy provides one possible answer to this question. They use social network theory to identify the way information may move between investors. Specifically, they focus on "connections between mutual fund managers and corporate board members via shared education networks." They find that "portfolio managers overweight firms they are connected to through their network, and perform significantly better on these holdings relative to non-connected firms" with "connected stocks" outperforming "non-connected stocks" by 8.4% per year. The extent of this outperformance seems to be linked to the closeness of the underlying network connection

between the parties involved. The authors also find that “returns are concentrated around corporate news announcements, consistent with mutual fund managers gaining an information advantage through the education networks.”

The second factor that could give rise to superior individual investor performance is the possession and use of some type of superior model for sifting through and making sense of the torrent of public information that pours through financial markets each day. Broadly speaking, these models can be divided into two categories, depending on whether they are relevant to forming an estimate of an investment’s fundamental value, or an estimate of how other investors are likely to behave in the future. For larger stocks and aggregate indexes (e.g., value, growth, small cap, mid cap, large cap, etc.) the likelihood of an individual investor possessing a better fundamental valuation model than institutional investors seems remote. However, this may not be the case for smaller and less liquid stocks that are of less interest to institutional investors.

On the other hand, it is easier to conceive of an individual investor who has a superior model – even if exists only in her head – for estimating the future emotions and actions of other investors, be they individuals or institutions. For example, Baber and Odean have demonstrated that “individual investors are net buyers of attention grabbing stocks” (see “All That Glitters: The Effect of Attention and News on the Buying Behavior of Individual and Institutional Investors”). In “The Usual Suspects: The Effects of Attention on Journalists’ Stock Recommendations”, Kerl and Walter show how journalists amplify this attention effect. In “Systematic Noise”, Barber, Odean and Zhu show that the attention effect may be one reason the trading of individual investors is far more correlated than one would expect; in “Do Noise Traders Move Markets?” they also show that the economic impact of this phenomenon is significant and adversely affects individual investors’ returns. And in “Profiting From Predictability”, Seasholes and Wu show how smart traders exploit this attention effect, earning up to .80% per day by buying stocks that have hit a new high, then selling out soon thereafter.

Once a stock becomes the focus of attention, it can trigger herding by investors, of either the rational type (i.e., when an investor buys in the belief that a price rise signals the possession of valuable private information by other investors) or the irrational type (driven by a wide range of other emotions and faulty cognitive processes). A good example of the latter

is found in a paper by Baquero and Verbeek (“Do Sophisticated Investors Believe in the Law of Small Numbers?”) which found that even experienced investors tend to infer the existence of patterns in what are, in reality, random data. Confirmation of this from a wholly different area is found in another fascinating recent paper, “Evidence of Betting Market Intra-Season Efficiency and Inter-Season Overreaction to Unexpected NFL Team Performance” by Steve Sapra.

Modern neuroscience and psychological research point to another source of superior estimates of other investors’ future emotions and behavior, in the form of identifying widely held expectations that aren’t likely to be met. Particularly when these surprises are on the downside, the resulting rise in uncertainty and disappearance of liquidity (to both of which most investors have a strong aversion) usually triggers sharp price declines.

Last but not least, the third factor that can give rise to superior individual investor performance over time is excellence in execution and learning. Studies have repeatedly shown that, as Barber and Odean wrote in a famous paper, “Trading is Hazardous to Your Wealth” (in another paper, “Just How Much Do Individual Investors Lose By Trading?”, Barber, Lee, Liu and Odean find that in Taiwan individual investor losses amounted to 2.8% of GDP). Overconfidence, overtrading and unwise execution (e.g., failure to rebalance regularly, or the use of full service instead of discount brokerage firms, high instead of no-load funds, and market instead of limit orders) all generate costs that substantially detract from investors’ realized compound returns. Over time, you would expect investors who are better at learning from their experience to generate higher long-term returns. However, as three recent papers show (“Why Inexperienced Investors Do Not Learn” by Glaser and Weber, “Reinforcement Learning and Investor Behavior” by Choi, Laibson, Madrian and Metrick, and “Do Individual Investors Learn from Their Trading Experience?” by Nicolosi, Peng and Zhu ), effective learning appears to be the exception rather than the rule – and thus another source of potential advantage for an individual investor.

So what does all this mean to the average investor? The good news is that it seems highly likely that, at least some times during an individual investor’s career, he or she will have an insight that could (assuming good execution) lead to the generation of a risk adjusted return above the expected return on the relevant index. The bad news is that it seems extraordinarily difficult for any investor to maintain any edge over a prolonged period of time.

To be sure, a few such investors exist. However, their challenge grows exponentially more difficult as their investable assets increase. To use a baseball analogy, most major league pitchers win at least one game; however, few win twenty games a season and very, very few can do this consistently over many years. That is why, for most people, most of the time, holding a well-diversified portfolio of broadly defined asset class index funds remains the most prudent long-term investment advice.

## Product and Strategy Notes

### An International Bond ETF for US Investors

Well Hallelujah! Somebody (in this case, State Street) has FINALLY launched an index product that invests in foreign currency bonds. The SPDR Lehman International Treasury Bond ETF (Ticker BWX) has an annual expense ratio of .50%. It tracks the Lehman Brothers Treasury Ex-US Capped Index, which includes bonds denominated in 11 currencies (basically, countries whose government debt has an investment grade rating). As we wrote in our December 2004 issue, all debt indexes are problematic. In this case, Lehman uses an adjusted (i.e., capped) market capitalization methodology that risks giving greater weight than we would like to heavy issuers of government debt (e.g., Japan). On balance, however, we are very pleased to see this product finally launched.

### New Research on Commercial Property as an Asset Class

A series of recent papers by Plazzi, Torous, and Valknanov provide some interesting insights into commercial real estate as an asset class (“Expected Returns and the Expected Growth of Rents of Commercial Real Estate”, “Valuation of in U.S. Commercial Real Estate” – with Eric Ghysels – and “The Cross-Sectional Dispersion of Commercial Real Estate Returns and Rent Growth”). They find that variations in the rent/property value ratio (the so-called “cap rate”, which is equivalent to an equity’s dividend/price ratio) forecast changes in expected returns for apartments, retail and industrial properties. Higher cap rates predict higher returns. However, this approach works less well for variations in office property returns. They conclude that, “taken together, variations in commercial real estate prices are largely due to movements in the discount rate as opposed to cash flows.” They then decompose fluctuations in the cap rate into three parts: changes in local demographic and economic conditions, growth in rents and a remainder term. The first two factors explain only about 30% of cap rate fluctuations, reinforcing the previous finding that discount rate changes are the driving factor in their variation over time. Finally, the authors find that the cross section of commercial property returns vary over time and exhibit a larger response to negative

economic shocks than to positive ones, probably due to the impact of restrained lending during downturns.

### A New Comparison of DFA and Vanguard

Edward Tower, a professor at Duke University, and his masters student, Cheng-Ying Yang have recently published a new paper: “DFA Versus Vanguard: Has DFA Outperformed Vanguard by Enough to Justify its Advisor Fees?” Needless to say, this is a subject about which reasonable people can and do disagree, so we read this with great interest. The analysis is based on data from 1999 to 2006. The authors perform their analysis by comparing the aggregate performance of DFA’s funds with the aggregate performance of what they claim to be a comparable portfolio of Vanguard funds. They find that the return of the DFA portfolio, “geometrically compounded, is 8.2% per year higher than Vanguard’s, and that DFA’s standard deviation of return is slightly higher.” However, they note that, over the period in question, DFA funds (which are heavily weighted toward small and value stocks) “may have outperformed Vanguard because DFA funds were focused on the right styles.” To correct this, they construct a portfolio of Vanguard funds that mimic the asset class and style weights of the aggregate DFA portfolio. On the basis of this comparison, DFA’s compound return differential falls to 2.46% per year over the eight year period studied. Another analysis used Fama French three factor analysis to construct the mimicking Vanguard portfolio, which reduces the advantage to 1.63% per year. Assuming a 2% per year reversal of the return differentials in favor of small and value tilts reduces the differential to 1.13% per year.

Thus far, the results of the analysis would seem to favor DFA. However, there are two caveats, one noted by the authors, and one not examined by them. The first caveat is that the authors’ analysis does not take taxes into account. As DFA funds can only be obtained through an adviser to whom an investor must pay a fee (while Vanguard funds can be bought directly with no advisor fees), the level of the advisor’s fee and its tax treatment can have a significant impact on the DFA versus Vanguard comparison, and possibly tilt it in the latter’s favor. The second caveat is that most investors do not see the problem in the same way as the authors’ analysis. Tower and Yang’s approach implies that investors use the aggregate performance of DFA versus Vanguard portfolios to determine which to use when implementing their asset allocation strategy. We disagree; in our experience, investors make

fund by fund comparisons for different asset classes and tilts, and not aggregate comparisons of one family to another (see our November 2004 issue for an example of this type of analysis). From this perspective, the answer to the question of “DFA or Vanguard” is not so clear cut; in our experience, it depends on the asset class and tilt in question.

### Learning From Our Mistakes

We recently conducted our own “after action review” of the events that roiled the world’s credit markets in August and September. Our objective was to identify any critical pieces of research that we had overlooked that would have better helped our readers prepare for what transpired. By far the most important was a report published in the Banque de France Financial Stability Review in May 2006. In “Market Liquidity Risk and Its Incorporation into Risk Management”, Arnaud Bervas presciently concluded that “the excessively optimistic assessment of market liquidity (i.e., the belief that transactions can be settled at current prices without any notable delays or transaction costs) may be a serious threat to financial stability...Admittedly [in comparison with the near failure of the Long Term Capital Management hedge fund in 1998], the financial community today appears to have a better grasp of the risks arising from the liquidity illusion. The fact nonetheless remains that current risk management tools, particularly the most common Value at Risk (VaR) measures, do not capture this complex component of market risk satisfactorily. In fact, standard VaR calculations do not take specific account of the risk to which a portfolio is exposed at the time it is liquidated.”

Bervas continues, “liquidity crisis is illiquidity risk that has reached its paroxysm. It may be defined as the market’s inability to absorb order flows without provoking violent price adjustments that are unrelated to fundamental value. It is characterized by the sudden widening of the bid-ask spread, or even the total disappearance of buy (or sell) flows and the inability to trade. It often leads to an increase in short-term volatility as well as the slump of the primary markets. It therefore contains the seeds of serious systemic upheaval...Extreme liquidity risk is not a sum of minor independent risks, but rather systemic risk that leads to a major break in the usual statistical relationships between risk factors. It is, admittedly, a rare risk, but one that is inherent to liberalized financial systems where phases of excessive

optimism alternate with sharp market decline.” Read the whole paper; it’s worth it, even after the fact.

Equally interesting is the second chapter of the IMF’s just published Global Financial Stability Review. It asks the question, “Do Market Risk Management Techniques Amplify Systemic Risks?” and finds that they do. “Having institutions that employ the same risk model [in this case, the VaR approach] is destabilizing both in terms of the covariance structure and volatility of returns relative to the historical baseline...Overall, VaR based systems provide the scope for self-reinforcing mechanisms to arise” as the institutions that use them all simultaneously sell assets to reduce their leverage and risk, triggering further asset price declines, more margin calls and reductions in liquidity, and even more asset sales. Finally, one last point about VaR models that has always bothered us was the source of their underlying assumptions about asset return volatility. As we have noted before, these assumptions usually come from one of three sources: (a) historical data (with the risk that the future may not resemble the past); (b) a model based forecast (with the risk that the model may be wrong); or (c) the volatility implied by market prices (with the risk that everyone may be making an incorrect assumption). As you can see, all of the alternatives have a good chance of being wrong; yet without volatility assumptions, most models used in modern finance would cease to work. More than anything else, the events of August and September made it painfully clear (as we have tried to do in our writing) that for all its pretensions of precision, there is much unavoidable uncertainty at the heart of modern finance, which will always remain as much an art as a science.

## **2006-2007 Model Portfolios Update**

Our model portfolios are constructed using a simulation optimization methodology. They assume that an investor understands the long-term compound real rate of return he or she needs to earn on his or her portfolio to achieve his or her long-term financial goals. We use SO to develop multi-period asset allocation solutions that are “robust”. They are intended to maximize the probability of achieving an investor’s compound annual return target under a wide range of possible future asset class return scenarios. More information about the SO methodology is available on our website. Using this approach, we produce model portfolios

for six different compound annual real return targets: 7%, 6%, 5%, 4%, 3%, and 2%. We produce two sets of these portfolios: one assumes only investments in broad asset class index funds. These are our “all beta” portfolios. The second set of model portfolios includes equity market neutral (uncorrelated alpha) funds as a possible investment. These assume that an investor is primarily investing in index funds, but is willing to allocate up to ten percent of his or her portfolio to equity market neutral investments.

We use two benchmarks to measure the performance of our model portfolios. The first is cash, which we define as the yield on a one year government security purchased on the last trading day of the previous year. For 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>