

# The Index Investor

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

## Contents

<i>January Issue: Key Points</i> .....	2
<i>Global Asset Class Returns</i> .....	2
<i>Uncorrelated Alpha Strategies Detail</i> .....	3
<i>Overview of Our Valuation Methodology</i> .....	4
<i>Table: Market Implied Regime Expectations and Three Year Return Forecast</i> .....	8
<i>Table: Fundamental Asset Class Valuation and Recent Return Momentum</i> .....	11
<i>Investor Herding Risk Analysis</i> .....	16
<i>This Month's Letters to the Editor</i> .....	17
<i>Emotional Regulation, Resilience, Intuition and Investment Decision Making</i> .....	19
<i>Global Asset Class Valuation Analysis</i> .....	28
Equities .....	29
Real Return Bonds.....	33
Government Bonds .....	36
Credit Spreads .....	39
Currencies .....	41
Commercial Property .....	42
Commodities.....	44
Gold.....	52
Timber .....	55
Volatility .....	61
<i>Advisors' Corner: Talking to Clients Who Are (or Want to Be) Entrepreneurs</i> .....	64
<i>Model Portfolios Update</i> .....	72

## January Issue: Key Points

In this month's issue, our feature article explores three interconnected issues that are critical to making good investment decisions over the long-term: emotion regulation, resilience, and the careful use of intuition. In our Advisors' Corner, we provide suggestions for a challenging task: how to talk with a client who either wants to become or already is an entrepreneur. Finally, in this month's letters, we once again explain our view of Fundamental Indexing, and summarize our feelings about financial markets as we close out 2010.

## Global Asset Class Returns

<i>YTD31Dec10</i>	<u>In USD</u>	<u>In AUD</u>	<u>In CAD</u>	<u>In EUR</u>	<u>In JPY</u>	<u>In GBP</u>	<u>In CHF</u>	<u>In INR</u>
Asset Held								
<b>USD Bonds</b>	6.13%	-7.84%	0.62%	12.62%	-8.65%	9.18%	-4.78%	2.06%
<b>USD Prop.</b>	28.30%	14.34%	22.80%	34.80%	13.52%	31.35%	17.39%	24.23%
<b>USD Equity</b>	17.09%	3.13%	11.59%	23.59%	2.31%	20.14%	6.18%	13.02%
<b>AUD Bonds</b>	15.97%	2.01%	10.47%	22.47%	1.19%	19.02%	5.07%	11.90%
<b>AUD Prop.</b>	13.95%	-0.02%	8.44%	20.44%	-0.83%	17.00%	3.04%	9.88%
<b>AUD Equity</b>	15.03%	1.07%	9.53%	21.53%	0.25%	18.08%	4.12%	10.96%
<b>CAD Bonds</b>	11.30%	-2.66%	5.80%	17.80%	-3.48%	14.35%	0.40%	7.23%
<b>CAD Prop.</b>	27.50%	13.54%	22.00%	34.00%	12.72%	30.55%	16.60%	23.43%
<b>CAD Equity</b>	22.67%	8.71%	17.17%	29.17%	7.89%	25.72%	11.77%	18.60%
<b>CHF Bonds</b>	13.79%	-0.17%	8.29%	20.29%	-0.99%	16.84%	2.89%	9.72%
<b>CHF Prop.</b>	38.27%	24.31%	32.77%	44.77%	23.49%	41.32%	27.36%	34.20%
<b>CHF Equity</b>	12.67%	-1.30%	7.16%	19.16%	-2.11%	15.72%	1.76%	8.60%
<b>INR Bonds</b>	0.54%	-13.42%	-4.96%	7.04%	-14.24%	3.59%	-10.36%	-3.53%
<b>INR Equity</b>	21.08%	7.11%	15.58%	27.58%	6.30%	24.13%	10.17%	17.01%
<b>EUR Bonds</b>	-2.14%	-16.10%	-7.64%	4.36%	-16.92%	0.91%	-13.05%	-6.21%
<b>EUR Prop.</b>	16.19%	2.22%	10.68%	22.68%	1.40%	19.23%	5.28%	12.11%
<b>EUR Equity</b>	-5.11%	-19.08%	-10.62%	1.38%	-19.90%	-2.07%	-16.02%	-9.19%
<b>JPY Bonds</b>	16.48%	2.51%	10.97%	22.97%	1.69%	19.52%	5.57%	12.41%
<b>JPY Prop.</b>	53.81%	39.85%	48.31%	60.31%	39.03%	56.86%	42.91%	49.74%
<b>JPY Equity</b>	12.76%	-1.20%	7.26%	19.26%	-2.02%	15.81%	1.86%	8.69%
<b>GBP Bonds</b>	3.76%	-10.20%	-1.74%	10.26%	-11.02%	6.81%	-7.14%	-0.31%

<b>YTD31Dec10</b>	<b>In USD</b>	<b>In AUD</b>	<b>In CAD</b>	<b>In EUR</b>	<b>In JPY</b>	<b>In GBP</b>	<b>In CHF</b>	<b>In INR</b>
<b>GBP Prop.</b>	0.99%	-12.97%	-4.51%	7.49%	-13.79%	4.04%	-9.91%	-3.08%
<b>GBP Equity</b>	12.38%	-1.58%	6.88%	18.88%	-2.40%	15.43%	1.48%	8.31%
<b>1-3 Yr USGvt</b>	2.27%	-11.69%	-3.23%	8.77%	-12.51%	5.32%	-8.63%	-1.80%
<b>World Bonds</b>	3.66%	-10.30%	-1.84%	10.16%	-11.12%	6.71%	-7.25%	-0.41%
<b>World Prop.</b>	22.95%	8.98%	17.44%	29.44%	8.16%	25.99%	12.04%	18.88%
<b>World Equity</b>	13.06%	-0.90%	7.56%	19.56%	-1.72%	16.11%	2.15%	8.99%
<b>Commod Long Futures</b>	16.23%	2.27%	10.73%	22.73%	1.45%	19.28%	5.33%	12.16%
<b>Commod L/Shrt</b>	-7.46%	-21.42%	-12.96%	-0.96%	-22.24%	-4.41%	-18.37%	-11.53%
<b>Gold</b>	29.27%	15.31%	23.77%	35.77%	14.49%	32.32%	18.36%	25.20%
<b>Timber</b>	11.36%	-2.60%	5.86%	17.86%	-3.42%	14.41%	0.46%	7.29%
<b>Uncorrel Alpha</b>	3.04%	-10.92%	-2.46%	9.54%	-11.74%	6.09%	-7.87%	-1.03%
<b>Volatility VIX</b>	-8.83%	-22.80%	-14.34%	-2.34%	-23.62%	-5.79%	-19.74%	-12.91%
<b>Currency</b>								
<b>AUD</b>	13.96%	0.00%	8.46%	20.46%	-0.82%	17.01%	3.06%	9.89%
<b>CAD</b>	5.50%	-8.46%	0.00%	12.00%	-9.28%	8.55%	-5.40%	1.43%
<b>EUR</b>	-6.50%	-20.46%	-12.00%	0.00%	-21.28%	-3.45%	-17.40%	-10.57%
<b>JPY</b>	14.78%	0.82%	9.28%	21.28%	0.00%	17.83%	3.88%	10.71%
<b>GBP</b>	-3.05%	-17.01%	-8.55%	3.45%	-17.83%	0.00%	-13.95%	-7.12%
<b>USD</b>	0.00%	-13.96%	-5.50%	6.50%	-14.78%	3.05%	-10.91%	-4.07%
<b>CHF</b>	10.91%	-3.06%	5.40%	17.40%	-3.88%	13.95%	0.00%	6.83%
<b>INR</b>	4.07%	-9.89%	-1.43%	10.57%	-10.71%	7.12%	-6.83%	0.00%

## Uncorrelated Alpha Strategies Detail

As we have repeatedly noted over the years, actively managed strategies whose objective is to produce returns with low or no correlation with the returns on major asset classes (so-called “uncorrelated alpha strategies”) have an undeniable mathematical benefit for a portfolio. Moreover, the potential size of this benefit increases with the portfolio’s long-term real rate of return target. On the other hand, we have also repeatedly noted that, for a wide range of reasons, active management is an extremely difficult game to play consistently well, and that this challenge only increases with time. Hence, in our model portfolios, we have tried to strike an appropriate balance between these two perspectives. We start by limiting allocations to uncorrelated alpha to no more than ten percent of a portfolio. We then equally divide this allocation between four different strategies. Within each strategy, we track the performance of two liquid, retail funds which can be used to implement it, and which

have far lower costs than the 2% of assets under management and 20% of profits typically charged by hedge fund managers using the same strategy (for more on the advantages of such funds, see “How Do Hedge Fund Clones Manage the Real World?” by Wallerstein, Tuchshmid, and Zaker). The following table shows the year to date performance of these funds (which are listed by ticker symbol):

<b>YTD 31Dec10</b>	<b>In USD</b>	<b>In AUD</b>	<b>In CAD</b>	<b>In EUR</b>	<b>In JPY</b>	<b>In GBP</b>	<b>In CHF</b>	<b>In INR</b>
<b>Eq Mkt Neutral</b>								
HSKAX	-3.90%	-17.87%	-9.41%	2.59%	-18.69%	-0.86%	-14.81%	-7.97%
OGNAX	-4.58%	-18.55%	-10.09%	1.91%	-19.36%	-1.54%	-15.49%	-8.65%
<b>Arbitrage</b>								
ARBFX	1.44%	-12.53%	-4.07%	7.93%	-13.34%	4.49%	-9.47%	-2.63%
ADANX	4.41%	-9.56%	-1.10%	10.90%	-10.38%	7.45%	-6.50%	0.33%
<b>Currency</b>								
DBV	0.85%	-13.12%	-4.65%	7.35%	-13.93%	3.90%	-10.06%	-3.22%
ICI	3.07%	-10.89%	-2.43%	9.57%	-11.71%	6.12%	-7.84%	-1.00%
<b>Equity L/S</b>								
HSGFX	-3.62%	-17.58%	-9.12%	2.88%	-18.40%	-0.57%	-14.52%	-7.69%
PTFAX	10.10%	-3.87%	4.59%	16.59%	-4.68%	13.15%	-0.81%	6.03%
<b>GTAA</b>								
MDLOX	9.80%	-4.17%	4.29%	16.29%	-4.99%	12.84%	-1.11%	5.73%
PASAX	12.86%	-1.11%	7.35%	19.35%	-1.93%	15.90%	1.95%	8.78%

## Overview of Our Valuation Methodology

This short introduction is intended to provide an overview of our valuation methodology, and to put the analyses that follow into a larger, integrated context. Our core assumption is that forecasting asset prices is extremely challenging, because unlike physical systems, the behavior of political economies and financial markets isn't governed by constant natural laws. Instead, they are complex adaptive systems, in which positive feedback loops and non-linear effects are common, due to the interaction of competing investment strategies (e.g., value, momentum, arbitrage and passive approaches), and investor decisions that are made on the basis of incomplete information, by individuals with limited cognitive capacities, who are often pressed for

---

time, affected by emotions, and subject to the influence of other people. We further believe that these interactions give rise to three different regimes in financial markets that are characterized by very different asset class return, risk, and correlation parameters. We term these three regimes “High Uncertainty”, “High Inflation” and “Normal Times.”

We emphasize that while forecasting the future behavior of a complex adaptive system (with a degree of accuracy beyond simple luck) is extremely challenging, it is not impossible. There are two reasons for this. First, complex adaptive systems are constantly evolving, and pass through phases when their behavior makes forecasting more and less challenging. In the investment context, we believe the best example of this is extreme overvaluations, which throughout history have confirmed that what can't continue doesn't continue. Second, it is also the case that, across a range of contexts, researchers have found that a small percentage of people and teams are able to develop superior mental models that provide them with a superior, if “coarse-grained” understanding of the dynamics of complex adaptive systems. More important there is also significant evidence that superior mental models translate into substantial performance advantages (see, for example, “Mental Models, Decision Rules, Strategy and Performance Heterogeneity” by Gary and Wood, “Team Mental Models and Team Performance” by Lim and Klein, and “Good Sensemaking is More Important than Information” by Eva Jensen).

We believe that investors are best served when their primary performance benchmark is the long-term real return their portfolio must earn in order to achieve their long term financial goals. We believe the best way to implement this approach is via a portfolio of broadly defined, low cost, low turnover, asset class index products that provide exposure to a diversified mix of underlying return generating processes. In this context, conservatively managing risk in order to avoid large losses is mathematically more important than taking aggressive risk position to reach for additional returns via actively managed strategies. This is not to say that in some cases investors would benefit from those additional active returns. Such cases typically involve aggressive goals, low starting capital, low savings, and/or a short time

horizon. In these situations, it is mathematically clear that an allocation to certain actively managed investment strategies can benefit a portfolio, provided the results of those strategies have a low or no correlation with returns on the investor's existing allocations to broad asset class index products. The use of these "uncorrelated alpha" products has a further benefit, in that they avoid the situation (common in traditional actively managed funds) where an investor pays much higher fees to an active manager for performance that is, in fact, a mix of the index fund's results (often referred to as "beta") and the manager's skill (often referred to as "alpha").

We also believe that, in addition to careful asset allocation, a disciplined portfolio risk management process is critical to an investor achieving his or her long-term goals. In our view, there are four main elements to this process. The first is a systematic approach to rebalancing a portfolio back to its target weights, either on the basis of time (e.g., yearly) or when one or more asset classes is over or under its target weight by a certain "trigger" amount. The second risk management discipline is the monitoring of asset class prices, in relation to estimates of both fundamental valuation and short-term investor behavior, matched with a willingness to reduce exposure (e.g., by hedging with options or moving into cash or undervalued asset classes) when overpricing becomes substantial and dangerous to the achievement of long-term goals. We stress that the objective of this process is not market timing in pursuit of higher returns; rather, we view this risk discipline as the willingness to depart from one's normal, long-term (i.e., "policy") asset allocation and rebalancing strategy under exceptional circumstances when crash risk is very high. Of course, this begs the question of when and how should one reinvest in an asset class after a bubble has inevitably burst. Again, we believe that fundamental valuation analysis should be an investor's guide to this third risk management discipline. From a long-term investment perspective, the best time to get back in is when an asset class is undervalued, even though this may be the most psychologically difficult time to do so. As a compromise approach, many investors choose to reinvest over time (i.e., "dollar cost average") to limit potential regret.

---

We also recognize that the valuation analyses which form the basis for these risk management decisions all contain an irreducible element of uncertainty. Hence, we believe that investors' fourth risk management discipline should be to combine our forecasts with those made by other analysts who use different methodologies. Research has demonstrated that forecast combination, using either simple averaging or more complex methods, improves forecast accuracy.

In each month's issue of our journals, we provide investors with updated valuation estimates for a wide range of asset classes. The basic assumptions that underlie our valuation methodology are as follows: (1) In the medium term, asset prices are attracted to their fundamental values. (2) However, fundamental valuation can only be estimated with a degree of uncertainty. (3) In the short term, asset prices are most strongly influenced by what Keynes called the market's "animal spirits", which we interpret as collective investor behavior resulting from the complex interplay between underlying political and economic trends and events, information flows, individual mental models, emotions, and social network interactions. (4) Valuation methodologies are most useful to investors when they are applied on a consistent basis over time.

The analyses we provide each month can be grouped into three major categories. First, we compare prevailing asset class prices to our estimate of fundamental values. Second, we present a number of analyses that are intended to warn of the development of conditions that raise the probability of sudden and substantial short-term changes in collective investor behavior. These include (a) Trends in rolling three month asset class returns that assess the probability of a High Uncertainty or High Inflation regime developing (which are dangerous since both of these are extreme disequilibrium conditions); (b) Trends in sector returns within asset classes that indicate the next turning points in the normal business cycle; (c) An assessment of the direction and intensity of recent price momentum (with accelerating positive momentum in the face of fundamental overvaluation the most dangerous condition); and (d) A measure of the estimated strength of investor networks and herding risk. Finally, we summarize our views with an estimate of the percent of time

that markets will spend in each regime over the next three years, and the resulting expected real returns on different asset classes over this time horizon.

### Table: Market Implied Regime Expectations and Three Year Return Forecast

We use the following table to provide insight into the weight of market views about which of three regimes – high uncertainty, high inflation, or normal growth – is developing. The table shows rolling three month returns for different asset classes. The asset classes we list under each regime should deliver relatively high returns when that regime develops. We assume that both the cross-sectional and time series comparisons we present provide insight into the market’s conventional wisdom – at a specific point in time -- about the regime that is most likely to develop within the next twelve months. To obtain the cross-sectional perspective, we horizontally compare the row labeled “This Month’s Average” for the three regimes. In our interpretation, the regime with the highest rolling three month average is the one which (on the specified date) the market’s conventional wisdom sees as the most likely to develop.

For the time series perspective, we vertically compare this month’s average rolling three-month return for each of the three regimes to the respective rolling three month averages three months ago. We believe this time series perspective provides insight into how fast and in what direction the conventional wisdom has been changing over time.

<b>Rolling Three Month Returns in USD</b>			<b>31Dec10</b>
<b>High Uncertainty</b>	<b>High Inflation</b>	<b>Normal Growth</b>	
Short Maturity US Govt Bonds (SHY) <b>-0.15%</b>	US Real Return Bonds (TIP) <b>-0.65%</b>	US Equity (VTI) <b>11.83%</b>	
1 - 3 Year International Treasury Bonds (ISHG) <b>-0.54%</b>	Long Commodities (DJP) <b>16.18%</b>	EAFE Equity (EFA) <b>6.99%</b>	

<b>Rolling Three Month Returns in USD</b>		<b>31Dec10</b>
<b>High Uncertainty</b>	<b>High Inflation</b>	<b>Normal Growth</b>
Equity Volatility (VIX) <b>-25.11%</b>	Global Commercial Property (RWO) <b>7.85%</b>	Emerging Equity (EEM) <b>7.21%</b>
Gold (GLD) <b>8.45%</b>	Long Maturity Nominal Treasury Bonds (TLT)* <b>-9.50%</b>	High Yield Bonds (HYG) <b>3.29%</b>
<b>Average</b> <b>-4.34%</b>	<b>Average (with TLT short)</b> <b>8.22%</b>	<b>Average</b> <b>7.33%</b>
<b>Three Months Ago:</b> <b>-3.79%</b>	<b>Three Months Ago:</b> <b>7.25%</b>	<b>Three Months Ago:</b> <b>14.37%</b>

\* Falling returns on TLT indicate rising inflation expectations

At the request of many readers, we now publish forecasts for real returns on different asset classes in USD. They can be compared to asset class return forecasts regularly produced by GMO, to which many of our readers also subscribe. Given our belief that foresight accuracy is improved by combining the outputs from different forecasting methodologies, we have taken a different approach from GMO. As we understand it (and their methodology is available on their site), they start with their estimate of current over or undervaluation, and assume that these will return to equilibrium over a seven-year business cycle. They believe that the use of this time horizon will cause a number of ups and downs caused by cyclical and investor behavior factors to average out. It has always struck us as a very logical approach, though one that (like ours) is based on unavoidably imperfect assumptions. The forecasting approach we have taken is grounded in our research in to the performance of different asset classes in three regimes, which we have termed high uncertainty, high inflation and normal times. In the latter regime, asset class returns are strongly attracted to their equilibrium levels – i.e., to the situation in which the returns supplied and the returns demanded are close to balance.

Our approach to estimating returns under this regime is to appropriate risk premiums for different asset classes to our estimate of the equilibrium yield on risk

---

return bonds when the system is operating under normal conditions. In contrast, the high uncertainty and high inflation regimes are very much disequilibrium conditions in which investor behavior determines the returns that are actually supplied. Under these regimes, our approach to return forecasting starts with our estimate of what the real rate of return would be (lower than normal under high uncertainty because of a lower time discount rate, and lower still under high inflation because of much stronger investor demand for inflation hedging assets like real return bonds). We then add an estimate of the realized return spread over the real bond yield for each asset class in the high uncertainty and high inflation regimes. To determine these premia, we began with the results from our historical regime analysis, and subjectively adjusted the results to make them more consistent with each other while generally preserving the rank ordering of asset class returns from our historical regime analysis.

The final step in our methodology is to subjectively estimate the percentage of time that the financial system will spend in each of the three different regimes over the next 36 months. These estimated probabilities may or may not change each month, in line with our assessment of evolving political and economic conditions. We are the first to admit that ours is, at best, a noisy estimate of the returns investors are likely to receive on different asset classes over our target time horizon. We have no doubt that GMO would say the same about the results produced by their methodology. Indeed, it is either naive or misleading to say anything else, given that one is attempting to forecast results produced by a constantly evolving complex adaptive system. On the other hand, we also believe that our readers appreciate our willingness to put a clear, quantitative stake in the ground, so to speak. As always, we stress that research has shown that foresight accuracy can be improved by combining (i.e., using simple averaging) forecasts produced using different methodologies. With that admonition, our results are as follows:

Regime	Normal Regime	High Uncertainty Regime	High Inflation Regime	Forecast Annual USD Real Return Over Next Three Years (weighted real return plus premium)
<i>Assumed Regime Probability Over Next 36 Months</i>	20%	50%	30%	
<i>Real Return Bond Yield</i>	3.5	2.5	1.5	2.4
<b><u>Asset Class Premia Over Real Rate (pct)</u></b>				
Domestic Bonds	1.0	1.0	-3.0	2.2
Foreign Bonds	0.5	2.0	0.5	3.7
Domestic Property	3.0	-10.0	1.0	(1.7)
Foreign Property	3.0	-10.0	-1.5	(2.5)
Commodities	2.0	-6.0	3.0	0.7
Timber	2.0	-8.0	1.0	(0.9)
Domestic Equity	3.5	-12.0	-5.0	(4.4)
Foreign Equity	3.5	-12.0	-7.0	(5.0)
Emerging Equity	4.5	-15.0	1.0	(3.9)
Gold	-2.0	2.0	2.5	3.8
Volatility	-25.0	50.0	25.0	29.9

### Table: Fundamental Asset Class Valuation and Recent Return Momentum

The table at the end of this section sums up our conclusions (based on the analysis summarized in this article) as to potential asset class under and overvaluations at **31 Dec 10**. We believe that asset prices reflect the interaction of three broad forces. The first is fundamental valuation, as reflected in the balance between the expected supply of and demand for returns. The Global Asset Class Valuation Analysis of each month's journal contains an extensive discussion of

---

fundamental valuation issues. One of our core beliefs is that while asset prices are seldom equal to their respective fundamental values (because the system usually operates in disequilibrium), they are, in the medium and long-run strongly drawn towards that attractor.

The second driver of asset prices, and undoubtedly the strongest in the short run, is investor behavior, which results from the interaction of a complex mix of cognitive, emotional and social inputs – the latter two comprising Keynes’ famous “animal spirits”. We try to capture the impact of investor behavior in each month’s Market Implied Expectations Analysis, as well as in two measures of momentum for different asset classes – one covering returns over the most recent three months (e.g., June, July and August), and one covering returns over the previous non-overlapping three month period (e.g., March, April, and May).

The third driver of asset prices is the ongoing evolution of political and economic conditions and relationships, and the degree uncertainty that prevails about their future direction. We capture these longer term forces in our economic scenarios.

In the table, we summarize our most recent conclusions the current pricing of different asset classes compared to their fundamental valuations.

The extent to which we believe over or underpricing to be the case is reflected in the confidence rating we assign to each conclusion. We believe it is extremely important for the recipient of any estimate or assessment to clearly understand the analyst’s confidence in the conclusions he or she presents. How best to accomplish this has been the subject of an increasing amount of research (see, for example, “Communicating Uncertainty in Intelligence Analysis” by Steven Rieber; “Verbal Probability Expressions in National Intelligence Estimates” by Rachel Kesselman, “Verbal Uncertainty Expressions: Literature Review” by Marek Druzdzel, and “What Do Words of Estimative Probability Mean?” by Kristan Wheaton). We use a three level verbal scale to express our confidence level in our valuation conclusions. “Possible” represents a relatively low level of confidence (e.g., 25% – 33%, or a 1 in 4 to 1 in 3 chance of being right), “likely” a moderate level of confidence (e.g., 50%, or a 1 in 2 chance of being right), and “probable” a high level of confidence (e.g., 67% to 75%, or

---

a 2 in 3 to 3 in 4 chance of being right). We do not use a quantitative scale, because we believe that would give a false sense of accuracy to judgments that are inherently approximate due to the noisy data and subjective assumptions upon which they are based.

An exception to this approach is our assessment of the future return to local investors for holding U.S. dollars. In this case, our conclusions are mechanically driven by interest rate differentials on ten-year government bonds. To be sure, the theory of Uncovered Interest Rate Parity, which calls for exchange rates offsetting interest rate differentials is more likely to apply in the long-run than in the short run, as the apparent profitability of the carry trade has shown (i.e., borrowing in low interest rate currencies to invest in high interest rate currencies). However, other research have found that a substantial portion of these profits represents compensation for bearing so-called “crash” risk (see “Crash Risk in Currency Markets” by Farhi, Fraiberger, Gabaix, et al) – as many who were long Icelandic Krona in 2007 and 2008 learned the hard way. In sum, exchange rates that are moving at an accelerating rate away from the direction they should move under interest rate parity indicates a rising risk of sudden reversal (i.e., crash risk).

The table also shows return momentum for different asset classes over the preceding three months, as well as the three months before that, to make it easier to see the direction of momentum, and whether it is accelerating, decelerating, or has reversed. The most dangerous situation is where an asset class is probably overvalued on a fundamental basis, yet positive return momentum is accelerating. As so many authors have noted throughout history, trends that can't continue don't continue. In these situations, we strongly recommend either hedging (e.g, via put options) or reducing exposure. In contrast, a situation where an asset class is probably undervalued, but negative return momentum is still accelerating, may be an exceptionally attractive opportunity to increase one's exposure to an asset class. Finally, conclusions about changes in asset class valuations also have to be seen in the longer term context of the possible evolution of alternative political/economic scenarios, and their implications for asset class valuations and investor behavior (see,

for example, our monthly Economic Updates). This is also an important input into investment decisions, as we do not believe that the full implications of these scenarios are typically reflected in current asset prices and investor behavior.

<i>Valuation at 31Dec10</i>	<i>Current Price versus Long-Term Fundamental Valuation Estimate</i>	<i>Rolling 3 Month Return in Local Currency</i>	<i>Rolling 3 Month Return 3 Months Ago</i>
<b>AUD Real Bonds</b>	Neutral	-1.14%	3.52%
<b>AUD Bonds</b>	Neutral	-5.09%	1.34%
<b>AUD Property</b>	Neutral	-2.14%	3.00%
<b>AUD Equity</b>	Neutral	4.09%	7.74%
<b>CAD Real Bonds</b>	Neutral	2.50%	4.19%
<b>CAD Bonds</b>	Possibly Overvalued	-0.98%	2.82%
<b>CAD Property</b>	Possibly Undervalued	-1.60%	17.69%
<b>CAD Equity</b>	Likely Overvalued	8.83%	9.85%
<b>CHF Bonds</b>	Likely Overvalued	-3.58%	1.59%
<b>CHF Property</b>	Likely Overvalued	3.62%	12.05%
<b>CHF Equity</b>	Likely Overvalued	5.23%	-7.13%
<b>EUR Real Bonds</b>	Neutral	-2.60%	2.25%
<b>EUR Bonds</b>	Likely Overvalued	-6.32%	2.87%
<b>EUR Prop.</b>	Neutral	3.77%	17.30%
<b>EUR Equity</b>	Neutral	4.23%	7.10%
<b>GBP Real Bonds</b>	Possibly Overvalued	1.22%	3.22%
<b>GBP Bonds</b>	Possibly Overvalued	-2.27%	3.33%
<b>GBP Property</b>	Possibly Undervalued	6.01%	12.62%
<b>GBP Equity</b>	Possibly Undervalued	8.12%	13.96%

<i>Valuation at 31Dec10</i>	<i>Current Price versus Long-Term Fundamental Valuation Estimate</i>	<i>Rolling 3 Month Return in Local Currency</i>	<i>Rolling 3 Month Return 3 Months Ago</i>
<b>INR Bonds</b>	Possibly Overvalued	-0.97%	-10.08%
<b>INR Equity</b>	Probably Overvalued	2.19%	13.38%
<b>JPY Real Bonds</b>	Neutral	1.85%	2.02%
<b>JPY Bonds</b>	Possibly Overvalued	-1.77%	1.50%
<b>JPY Property</b>	Likely Undervalued	25.50%	9.27%
<b>JPY Equity</b>	Probably Overvalued	8.73%	0.96%
<b>USD Real Bonds</b>	Neutral	-0.74%	2.57%
<b>USD Bonds</b>	Possibly Overvalued	-2.38%	2.84%
<b>USD Property</b>	Neutral	7.42%	7.18%
<b>USD Equity</b>	Likely Overvalued	11.65%	11.56%
<i>Following in USD:</i>			
<b>Investment Grade Credit (CIU)</b>	Possibly Overvalued	-1.56%	3.92%
<b>High Yield Credit (HYG)</b>	Probably Overvalued	3.12%	7.53%
<b>Emerging Mkt Equity (EEM)</b>	Likely Overvalued	7.49%	18.74%
<b>Commodities Long</b>	Likely Overvalued	16.18%	12.33%
<b>Gold</b>	Likely Overvalued	8.45%	5.12%
<b>Timber</b>	Likely Undervalued	6.56%	7.07%
<b>Uncorrelated Alpha</b>	N/A	0.45%	3.11%
<b>Volatility (VIX)</b>	Probably Undervalued	-25.11%	-31.38%
<i>Future Return in Local Currency from holding USD:</i>	<i>Based on Covered Interest Parity</i>		
<b>Returns to AUD Investor</b>	Positive	-6.84%	-12.94%
<b>Returns to CAD Investor</b>	Neutral	-3.38%	-3.50%
<b>Returns to EUR Investor</b>	Neutral	1.57%	-8.53%
<b>Returns to JPY Investor</b>	Negative	-3.78%	-6.57%
<b>Returns to GBP Investor</b>	Neutral	0.61%	-4.60%
<b>Returns to CHF Investor</b>	Negative	-5.41%	-9.55%

---



---

	<b><i>Current Price versus Long- Term Fundamental Valuation Estimate</i></b>	<b><i>Rolling 3 Month Return in Local Currency</i></b>	<b><i>Rolling 3 Month Return 3 Months Ago</i></b>
<b><i>Valuation at 31Dec10</i></b>			
<b>Returns to INR Investor</b>	Positive	-0.53%	-3.37%

## **Investor Herding Risk Analysis**

One of our core assumptions is that financial markets function as complex adaptive systems. One of the key features of such systems is their ability to pass through so-called “phase transitions” that materially change their character once certain variables exceed or fall below critical thresholds. In our September 2009 issue, we reviewed a paper on one of critical variables, “Leverage Causes Fat Tails and Clustered Volatility” by Turner, Farmer and Geanakoplos. This paper more formally demonstrated the importance of a factor that has been associated with booms and busts throughout financial history: the expansion of the supply of credit at a pace well in excess of real economic growth. In the past we have also noted that rising uncertainty tends to increase the size, degree of connectedness and intensity of communications within social networks that influence investor decision making. In turn, this leads to greater coordination of investor behavior, causing not only a higher tendency toward momentum, but also higher fragility, and susceptibility to rapid changes in asset prices (see, for example, “Asset Pricing in Large Information Networks” by Ozsoylev and Walden, or “Dragon Kings, Black Swans, and the Prediction of Crises” by Didier Sornette).

As a practical matter, the challenge for investors has been to identify variables or statistics that can be used to track the strengthening of networks that is often associated with phase transitions. With this in mind, we call readers’ attention to an excellent paper by Lisa Borland, of the asset management firm Evnine and Associates in San Francisco (“Statistical Signatures in Times of Panic: Markets as a Self Organizing System”). Using the phase transition approach, Borland searched for statistical signatures of market panics, and proposes a new order parameter that is

easy to calculate and appears to capture the changing dynamics of asset return correlations and the underlying social network and herding phenomena that give rise to them. The parameter equals the number of financial markets or assets that have positive returns over a given interval (in 2010 we switched from YTD to just the past month, as we believe it provides a more accurate assessment), less the number that have negative returns, divided by the total number of financial markets or asset classes evaluated. If the value is zero, the markets are in a disordered state and far from the potential phase change point. However, as the parameter value approaches positive one or negative one, the markets are in an increasingly ordered state – that is, networks are larger and more active, causing increased alignment in collective investor behavior (more commonly known as “herding”). Under these conditions, a market may be close to a phase change point, and therefore subject to a sudden, and potentially violent, shift in its previous trend. We have calculated this order parameter for the 38 financial markets (excluding foreign exchange) we evaluate each month. Here are the results for each of the most recent 12 months:

Jan10	Feb10	Mar10	Apr10	May10	Jun10	Jul10	Aug10	Sep10	Oct10	Nov10	Dec10
(0.03)	0.30	0.46	0.44	(0.28)	0.28	0.35	0.24	0.51	0.41	(0.57)	0.46

Given these data, we conclude that at **31 Dec 10**, there was a moderate risk of a sudden, substantial, and highly correlated change in prices across multiple asset classes.

### **This Month’s Letters to the Editor**

*Bob Arnott’s Fundamental Indexing approach continues to receive lots of publicity. Have you changed your mind about it, in light of this year’s performance?*

No, we haven’t. We stand by the views we first put forth five years ago. First, the only truly passive portfolio is the one that all investors could hold if they wanted to. By definition, this is the market capitalization weighted portfolio. For example, if all investors chose to hold their U.S. equity allocation in Bob’s Fundamental Index fund, it

---

would become the market cap weighted portfolio. Therefore, any deviation from the market cap weighted portfolio by definition represents an active management decision, which in turn should be grounded in the belief that an investor possesses either superior information and/or a superior model for predicting either asset values or future investor behavior. In this sense Fundamental Indexing is an active management strategy, apparently based on a superior model for predicting future asset values (and therefore returns). This brings us to the second question that all active management strategies confront: By pursuing this strategy, do you expect to earn higher returns in exchange for taking on higher risk (which would be consistent with a reasonably efficient market) or do you expect to earn higher returns for the same or lower risk than would be the case for a passive investment (which would be consistent with an inefficient market)? On this point, Bob seems to be somewhat equivocal; many commentators have noted that Fundamental Indexing involves a tilt toward companies with low market/book ratios (i.e., what some would call a “value factor” tilt), which would be consistent with earning higher returns in a reasonably efficient market. But to play devil’s advocate, if someone were to assert that Fundamental Indexing should actually deliver higher returns for the same or less risk than the passive alternative, they would have to address two further questions. First, why have so many investors consistently failed to accurately value larger companies (which have been undervalued) and smaller companies (which have been overvalued)? And second, what prevents other investors from copying the Fundamental Indexing strategy and competing away its superior returns? While arguments can be made about the first question, we find the second much harder to answer. Since the Fundamental Indexing methodology is well known, we don’t see what the obstacles would be to replicating it, particularly at a hedge fund that isn’t selling shares to the public (and hence could easily program a trading algorithm to match it, without attracting the attention of Bob’s attorneys). Hence we conclude that Fundamental Indexing is essentially an active management strategy that one should expect will deliver higher long-term returns with higher risk than a passive investment in a broad equity market index.

---

*Could you briefly sum up your feelings about financial markets and asset classes as we close out 2010?*

Very worried, for the reasons we described at length last month. In fact, the climate today reminds us more than a little of the climate in May 2007, when we issued our warning to move out of overvalued asset classes and into not only undervalued asset classes, but also cash (which for us includes a mix of currencies and gold coins). This latter move was a very, very rare recommendation for us, at a time when investor optimism was still very high. Once again, as we close out 2010, we see a lot of forecasts that seem quite optimistic about the future, and likely asset class returns (and in particular, equity market returns) in 2011 (Philip Coggan, aka Buttonwood, being a notable exception to this general trend). Too many things have to go right for these forecasts to prove accurate – remember, if these events are reasonably independent, the probability that the forecast is accurate can be approximated by the joint probability that its assumptions are accurate. So once again, we urge our readers to undertake year end rebalancing across asset classes, underweighting (or buying hedges against downside risks) on those that seem likely or probably overvalued, and overweight on those few that seem likely or probably undervalued. And to the extent that an investor comes up with a mismatch between over and undervalued asset classes after doing this, we would recommend increasing cash until we see how the many uncertainties we face resolve themselves in 2011. Once again, we stress that when it comes to achieving long term portfolio real return goals, avoiding substantial losses is, mathematically, far more important than staying in an overvalued market in the hopes of earning just a little more incremental return.

## **Emotional Regulation, Resilience, Intuition and Investment Decision Making**

Sometimes you come across an article that really grabs you because it pulls together different strands of research and gives you a new perspective on an important issue. We recently had one of those all-too-rare experiences. The article in

question is “Thinking, Feeling and Deciding: The Influence of Emotions on Decision Making and Performance of Traders” by Fenton-O’Creevy, Soane, Nicholson, and Willman. The paper builds on a previous book (Traders) by three of the authors, and is based on their study of traders at four London investment banks. The unique “real world” nature of this paper gives extra weight to its conclusions. The author’s key insights come from their comparison of high and low performing traders, and their finding of significant differences in their “strategies for emotional regulation and “in how they engage with their intuitions.” The authors begin with an overview of recent research on the relationship between emotion and cognition, stressing the most recent view that they are complementary and intertwined, rather than separate and antithetical systems. They noted that “the brain’s capacity for conscious deliberation is limited and can be depleted, much as a muscle becomes exhausted. Thus, particularly in fast-paced and demanding environments, conscious deliberation is reserved for tasks that are accorded the highest priority.” Given this, “emotions have an important role as cues to decision making...and affect decision making performance. First, emotions can induce biases and skew information retrieval...Overall, positive feelings tend to be associated with optimistic decision making and negative feelings with pessimistic choices.” Emotions also have a role in risk assessment. “Investors who experienced more intense positive and negative emotional reactions to gain and loss were poorer performers than those with more attenuated emotional responses.” In sum, “the evidence on the nature of emotions’ impact is mixed. While there is evidence of the biasing effect of emotions, there is also evidence that we rely on emotional cues in rapid, automatic decision making...accounts of emotions as bias focus on the potential for emotions to have a negative influence on performance. By contrast, accounts of emotions as information focus primarily on the valuable role of emotions in encapsulating [and facilitating the recall of] prior relevant experience.” Based on their research, the authors conclude that “emotion regulation is critical to moderating the impact of emotions on traders’ decision making.”

Emotion regulation is a subject that has been gaining increasing attention from other researchers. An excellent overview of this subject can be found in “Emotion

---

Regulation: Conceptual Foundations”, a paper by Gross and Thompson. They present a model of the emotion generating process, and highlight five points where it can be regulated. The authors begin by addressing the thorny issue of how to define emotion. They highlight three core features of emotion. First, “emotions arise when an individual attends to a situation and sees it as relevant to the achievement of his or her goals.” Second, “emotions are multi-faceted, whole-body phenomena that involve loosely-coupled changes in the domains of subjective experience, behavior, and physiology.” Third, “the multi-system changes associated with emotion are rarely obligatory...[On the one hand], emotions do possess an imperative quality, meaning that they can interrupt what we are doing and force themselves upon our awareness. However, emotions must also compete with other responses that are also occasioned by the social matrix within which our emotions typically play out...It is this third aspect of emotion that makes their regulation possible.”

The authors’ regulation model begins with a psychologically relevant situation, either external or internal (i.e., a mental representation). Situations develop and are attended to in various ways, giving rise to appraisals that constitute an individual’s assessment of, among other things, the situation’s familiarity and significance. In turn, these appraisals give rise to emotional responses, including the way the situation is experienced, physiological and neurological changes (e.g., changes in stress responses, perceived emotions over the short term, and mood responses over a longer time horizon), and in some cases behaviors (the authors note that emotions tend to drive behavioral responses, while moods bias cognitive perceptions).

Based on this view of how emotions are generated, the authors note four broad and different regulatory approaches that appear in the literature, including coping, emotion regulation, mood regulation, and psychological defenses. “Coping is distinguished from emotion regulation both by its predominant focus on decreasing negative affect and by its emphasis on much longer periods of time (e.g., coping with bereavement)...In part due to their less well defined behavioral response tendencies, in comparison with emotion regulation, mood regulation is more concerned with altering emotions experienced and their cognitive impact than with emotion driven

---

behavior...Like coping, psychological defenses typically have as their focus the regulation of aggressive impulses and their associated negative emotion experience, particularly anxiety. These defenses are usually unconscious and automatic and are usually studied as stable individual differences.”

This discussion sets the stage for the authors’ discussion of their five point model for emotion regulation, which they define as follows.

(1) “Situation Selection”, which “involves taking actions that make it more or less likely that one will end up in a situation that one expects will give rise to desirable or undesirable emotions.” While initially attractive, the authors note that “situation selection requires an understanding of the likely features of remote situations, and an individual’s expected emotional response to them. There is a growing appreciation of just how hard it is to gain such an understanding in advance.”

(2) “Situation Modification” involves “efforts to directly modify a situation one is in to alter its emotional impact.”

(3) “Attentional Deployment”. “It is also possible to regulate emotions without actually changing the environment. Individuals can direct their attention within a situation in order to influence their emotional response to it...Two major attentional strategies are distraction and concentration. The former focuses attention on different aspects of the situation, or away from it altogether. The latter draws attention to emotional features of a situation – to one’s feelings and their possible consequences.”

(4) “Cognitive Change.” “Even after a situation has been selected, modified, and attended to, an emotional response is by no means a foregone conclusion. Emotion requires that perceptions be imbued with meaning, and that individuals evaluate their capacity to manage the situation. Cognitive change refers to how one appraises the situation one is in so as to alter its emotional significance, either by changing how one thinks about the situation or about one’s capacity to manage the demands it poses.”

(5) “Response Modulation.” “In contrast with other emotion regulatory processes (so-called ‘antecedent-focused’ approaches, which seek to change emotions before emotional responses have become fully activated), response

---

modulation occurs late in the emotion generating process, after response tendencies have been initiated, and involves influencing the physiological or behavioral response to a situation and the emotions it generates...through techniques such as exercise, relaxation, and drugs.”

In practice, of course, people use multiple approaches to regulate their emotions. Moreover, some of those responses can themselves alter the situation (e.g., when other people are involved), so in practice emotional regulation is often a complex adaptive process, with feedback loops and non-linear responses to change. However, as the authors of the traders paper show, emotional regulation has a critical impact on performance. They divided traders into four groups, based on their experience and performance. “Traders in the low experience group typically started by presenting themselves as fairly immune to the impact of emotion on their trading. However, as our interviews progresses, they would often reveal more vulnerability to emotions than they had claimed initially. Traders in the low experience, low pay group did not talk at all about actively managing their emotions. Traders in the low experience, high pay group talked about removing themselves from situations where their emotions became a problem (situation modification) or avoiding situations entirely which make them feel bad (situation selection)...Traders in the experienced group more commonly talked about strategies for emotion regulation. However, the nature of these strategies tended to vary between the low paid and high paid groups.”

“In the high experience, low paid group, traders seemed to find it hard to articulate how they managed their emotions and the emotion regulation strategies they identified were predominantly situation avoidance, situation modification, and response modulation. There was a marked contrast in the responses from high performing traders, who often showed a greater willingness to reflect on their emotions. Emotion regulation for these traders tended to focus mainly on how they directed their attention (attention deployment) and how they framed their experiences of loss and gain (cognitive change). There was a notable absence of avoidance behavior in this group. The willingness among high performing traders to experience negative emotion in order to achieve long term goals is consistent with the argument that positive self-

development requires strategies to optimize positive emotions, but also the ability to tolerate tension and negativity to achieve long term goals.”

The authors also note that “there may be another important reason why response modulation strategies are maladaptive for traders. Emotion cues generated by reactions to information relevant to current trading under time constraints play an important role in guiding attention and rapidly choosing appropriate action. Poor regulation of emotions (and attempts to completely suppress them) allows emotions to carry over, biasing subsequent risk evaluation and affecting subsequent trading behavior.”

In addition to their evaluation of emotion regulation strategies at the individual level, the authors also make some important points about the role of managers in this process. They note that many managers “clearly saw regulating the emotions of traders who worked for them as a key element in managing trader performance” and “many traders described such episodes of managerial intervention as crucial to their learning and development.”

The authors’ conclusions regarding the importance of emotion regulation is also consistent with another strand of recent research on the subject of emotional resilience or “hardiness.” This has been described as “a successful adaptation or the absence of pathological outcome following exposure to highly stressful or potentially traumatic life events or life circumstances. It involves both the capacity to maintain a healthy outcome following exposure to adversity and the capacity to rebound after a negative experience.” The authors of this definition also found that “people with a history of some lifetime adversity reported better mental health and well-being than not only people with a high history of adversity, but also than people with no history of adversity.” (“Whatever Does Not Kill Us: Cumulative Lifetime Adversity, Vulnerability, and Resilience” by Seery, Holman and Silver). In another paper, (“Big Five Personality Factors, Hardiness, and Social Judgment as Predictors of Leader Performance” by Barton, Eid, Johnsen, Laberg and Snook), the authors find that hardiness is distinct from the big five personality factors (Openness, Conscientiousness, Extraversion, Agreeableness, and Neuroticism – OCEAN). They observe that “hardy persons have a

---

high sense of life and work commitment, a greater feeling of control over what happens to them, and are more open to change and challenges in life. They tend to interpret stressful and difficult experiences as normal features of a life which is overall interesting and worthwhile.” The resilience concept has been validated by the military (see, for example, “Resiliency on the Battlefield”, *Science Daily*, 5Jan11). As a result, resilience has become a key screening criteria for selection into special forces units (see “Psychological Hardiness Predicts Success in US Army Special Forces Candidates”, by Bartone, Roland, Picano, Williams), as well as the focus of a new initiative to improve resilience across the entire U.S. Army ([http://www.army.mil/csf/downloads/Goals\\_Book.pdf](http://www.army.mil/csf/downloads/Goals_Book.pdf)).

The second major theme of the paper on traders focuses on the role of intuition, and the role of emotional cues in traders’ decision making. Again, this is consistent with a growing body of research in other areas, particularly the military where substantial research has been undertaken that compares intuitive to analytical approaches to decision making. More formally, the intuitive approach is often referred to as the “recognition primed model” (RPM), or “naturalistic decision making” (NDM), in reference to the way decisions are made in the field, or “natural” contexts. Analytic decisions are made using an explicit, structured approach (e.g., define decision problem, define criteria for evaluating possible solutions, develop options, evaluate and compare them, select and implement one of them, and check results). More formally, this process is often referred to as “multiattribute decision making.” Under time pressure, it often breaks down and results in poor decisions.

In contrast, in the RPM model an experienced decision maker observes a situation, uses the cues it provides to recall from memory key aspects of similar situations as well as the action plans that were used in them, mentally simulates the consequences of implementing in the present situation a plan that worked in the past, and then either implements it or, if the mental simulation produces an unacceptable outcome, either cycles back to evaluate another plan or, if time is available, undertakes a more analytic decision process (see, for example, “Professional Judgments and Naturalistic Decision Making” by Ross, Shafer and Klein, or “The

Recognition Primed Decision Model” by Bushey and Forsyth). Provided the decision maker has an adequate store of experience on which he or she can draw, the RPM approach is ideal in situations where decisions must be made in the face of high uncertainty and time pressure. As other writers have noted (e.g., William Duggan in “Coup D’Oeil: Strategic Intuition in Army Planning”), it is incorrect to say that RPM involves no analysis; rather, a more accurate statement is that RPM involves a tighter integration of intuition and analysis than the multiattribute approach.

Regarding the mental process used by an experienced decision maker under RPD, there are two competing theories. As described by Brehmer and Kuylenstierna (“Towards an Understanding of the Commander’s Coup D’Oeil”), “the pattern recognition hypothesis assumes that experts have learned to categorize information in terms of recurring patterns in their domain. They then remember the patterns and use them in recall. The constraints hypothesis assumes that experts have learned to pick up information about the goal-related constraints in a domain, and use that information to quickly cut down on the number of possibilities (e.g., key variables, relationships between them, likely evolution, potential courses of action), when evaluating a given situation. Based on accumulated learning and experience, they reproduce what they know must be the case, given their understanding of the goals and constraints in a give situation.” The authors also note that “although these two theories sound very different, it is difficult to distinguish between them empirically, for they make the same predictions and they do so on a very similar basis. They both assume that the advantage enjoyed by experts is based on their having to store less information than novices do to perform well at recall. They differ in what is assumed to have been learned by the expert: typical goals and constraints or typical patterns.” While recognizing that more study of these theories is required, the authors tentatively conclude that “it seems more likely that expertise is a matter of learning constraints than patterns”, because the former are more general, while “learning patterns is a slow and laborious process.”

Intuition has also been the subject of studies of decision making in business organizations. For example, in “An Examination of the Role of Intuition in Individual

Decision Making in Organizations”, Martin and Hanlon note that it is widespread, and should be viewed as a complement to more “rational” or analytical approaches, particularly when decision problems are poorly structured (e.g., when uncertainty is high). Similarly, in “Exploring Intuition and Its Role In Decision Making”, Dane and Pratt define intuition as “affectively charged judgments that arise through rapid, nonconscious and holistic associations [i.e., the characteristics of situation are matched with patterns or constraints held in memory].” They note that in any study of intuitive decision making, it is critical “to distinguish between when intuitions are used and when they are used effectively.”

For example, “evidence suggests that individuals are likely to rely on intuitive thought processes when they face extreme time pressure. The mere use of intuition, however, is not a panacea for the speed-accuracy tradeoff, since its use may simply facilitate speed at the expense of accuracy. Therefore, we need to better understand those conditions that foster the effective use of intuition.” The authors also note the extensive overlap between the study of intuition and the study of expertise and expert reasoning, but note that “intuitive judgments often involve emotions” – i.e., they are “affectively charged.” This suggests a critical role for emotion, including the encoding of key information in long-term memory to facilitate its later recall (e.g., emotionally charged memories), and a decision-maker’s ability to quickly recall and combine such memories when a situation triggers an emotional response. This is closely related to the authors’ discussion of the effectiveness of intuitive decisions, where they draw a distinction between situations in which a decision maker has deep domain knowledge (i.e., is an expert) versus those where this is not the case. In broad terms, in emotionally charged situations are more likely to produce effective decisions in the first case, while in the latter it is more likely that strong emotions will produce biased and suboptimal decisions.

The findings in the traders paper are consistent with this perspective. The authors note their observation that “some traders see a more subtle and sophisticated role for emotions, which represent an unconscious drawing on experience...Feelings are seen as a kind of radar, directing attention and shaping perceptions around

opportunities, to enable them to be promptly seized... through rapid decision making under time pressure...Experienced traders made much more frequent references to intuition, or gut feel, than less experienced traders. However, again there were important differences between low and high paid traders in the high experience group. Low paid traders who talked about the use of intuition often talked of it in terms of a rather mysterious process. You either had a feeling or not. By contrast, the top paid group tended to reflect critically about the origins of their intuitions, and to bring them together with more objective information...to make judgments about the relevance of their feelings to the decision at hand.” The authors conclude that “traders emotions and cognition are inextricably linked...Overall, the data support a picture of expert traders having [n explicit engagement with their emotions], entailing a discrimination between emotions in terms of their relevance to the decision at hand and effective strategies for emotion regulation to enhance their performance.” Encouragingly, “this study also provides evidence that more effective emotion regulation strategies can be learned in a financial decision making context, and the key role of management in this process.”

## **Global Asset Class Valuation Analysis**

Our asset class valuation analyses are based on the belief that financial markets are complex adaptive systems, in which prices and returns emerge from the interaction of multiple rational, emotional and social processes. We further believe that while this system is attracted to equilibrium, it is generally not in this state. To put it differently, we believe 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, resulting in over or underpricing relative to fundamental value. The attraction of the system to equilibrium means that, at some point, these prices are likely to reverse in the direction of fundamental value. However, the very nature of a complex adaptive system makes it hard to forecast when such reversals will occur. It is also the case that, in a constantly evolving complex adaptive system like a financial market, any

---

estimate of fundamental value is necessarily uncertain. Yet this does not mean that valuation analyses are a fruitless exercise – far from it. For an investor trying to achieve a multiyear goal (e.g., accumulating a certain amount of capital in advance of retirement, and later trying to preserve the real value of that capital as one generates income from it), avoiding large downside losses is mathematically more important than reaching for the last few basis points of return. Investors who use valuation analyses to help them limit downside risk when an asset class appears to be substantially overvalued can substantially increase the probability that they will achieve their long term goals. This is the painful lesson learned by too many investors in the 2001 tech stock crash, and then learned again in the 2007-2008 crash of multiple asset classes.

We also believe that the use of a consistent quantitative approach to assessing fundamental asset class valuation helps to overcome normal human tendencies towards over-optimism, overconfidence, wishful thinking, and other biases that can cause investors to make decisions they later regret. Finally, we stress that our monthly market valuation update is only a snapshot in time, and says nothing about whether apparent over and undervaluations will in the future become more extreme before they inevitably reverse. That said, when momentum is strong and quickly moving prices far away from their fundamental values, it is usually a good indication a turning point is near.

### Equities

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. While this approach emphasizes fundamental valuation, it does have an implied linkage to the investor behavior factors that also affect valuations. On the supply side of our framework, investors under the influence of fear or euphoria (or social pressure) can deflate or inflate the long-term real growth rate we use in our analysis. Similarly, fearful

---

investors will add an uncertainty premium to our long-term risk premium, while euphoric investors will subtract an “overconfidence discount.” As you can see, euphoric investors will overestimate long-term growth, underestimate long-term risk, and consequently drive prices higher than warranted. In our framework, this depresses the dividend yield, and will cause stocks to appear overvalued. The opposite happens under conditions of intense fear. To put it differently, in our framework, it is investor behavior and overreaction that drive valuations away from the levels warranted by the fundamentals. As described in our November 2008 article “Are Emerging Market Equities Undervalued?”, people can and do disagree about the “right” values for the variables we use in our fundamental analysis.

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 31 Dec 10*

<i>Australia</i>	<b>Low Demanded Return</b>	<b>High Demanded Return</b>
<b>High Supplied Return</b>	72%	105%
<b>Low Supplied Return</b>	107%	145%

<i>Canada</i>	<b>Low Demanded Return</b>	<b>High Demanded Return</b>
<b>High Supplied Return</b>	60%	116%
<b>Low Supplied Return</b>	122%	192%

<i>Eurozone</i>	<b>Low Demanded Return</b>	<b>High Demanded Return</b>
<b>High Supplied Return</b>	56%	94%
<b>Low Supplied Return</b>	94%	138%

<i>Japan</i>	<b>Low Demanded Return</b>	<b>High Demanded Return</b>
<b>High Supplied Return</b>	68%	132%
<b>Low Supplied Return</b>	143%	225%

<i>United Kingdom</i>	<b>Low Demanded Return</b>	<b>High Demanded Return</b>
<b>High Supplied Return</b>	28%	72%
<b>Low Supplied Return</b>	68%	119%

<i>United States</i>	<b>Low Demanded Return</b>	<b>High Demanded Return</b>
<b>High Supplied Return</b>	71%	138%
<b>Low Supplied Return</b>	152%	239%

<i>Switzerland</i>	<b>Low Demanded Return</b>	<b>High Demanded Return</b>
<b>High Supplied Return</b>	55%	100%
<b>Low Supplied Return</b>	101%	254%

---



---

<i>India</i>	<b>Low Demanded Return</b>	<b>High Demanded Return</b>
<b>High Supplied Return</b>	56%	153%
<b>Low Supplied Return</b>	183%	330%

<i>Emerging Markets</i>	<b>Low Demanded Return</b>	<b>High Demanded Return</b>
<b>High Supplied Return</b>	51%	114%
<b>Low Supplied Return</b>	80%	143%

In our view, the key point to keep in mind with respect to equity market valuations is the level of the current dividend yield (or, more broadly, the yield of dividends and buybacks), which history has shown to be the key driver of long-term real equity returns in most markets. The rise in uncertainty that accompanied the 2007-2008 crisis undoubtedly increased many investors' required risk and uncertainty premium above the long-term average, while simultaneously decreasing their long-term real growth forecasts. The net result was a fall in equity prices that caused dividend yields to increase. From the perspective of an investor with long-term risk and growth assumptions in the range we use in our model, in some regions this increase in dividend yields more than offset the simultaneous rise in real bond yields, and caused the equity market to become undervalued (using our long-term valuation assumptions). On the other hand, in a still weak economy, many companies have been cutting dividends at a pace not seen since the 1930s. Hence the numerator of our dividend/yield calculation may well further decline in the months ahead, which, all else being equal, should further depress prices.

Despite this, the months since March 2009 have seen a very strong rally develop in many equity markets, which, in some cases, has caused our valuation estimates to rise into the "overvalued" region. Given the absence of progress in reducing the obstacles that block a return to sustainable economic growth (see our recent Economic Updates), we believe that these rallies reflect investor herding, rather

---

than a substantial improvement in the underlying fundamentals. In turn, we strongly suspect that the root causes of this herding phenomenon, which appears to have strengthened in recent years, lie in a combination of the rising percentage of assets (and even higher percentage of trading) accounted for by delegated asset managers (rather than the investors who own the assets being traded), the incentive structure faced by these delegated managers (e.g., 2 and 20 on this year's returns), and the rise of algorithmic trading.

### Real Return Bonds

Let us now move on to a closer look at the current level of real interest rates. In keeping with our basic approach, we will start by looking at the theoretical basis for determining the rate of return an investor should demand in exchange for making a one-year risk free investment. The so-called Ramsey equation tells us that this should be a function of a number of variables. The first is our "time preference", or the rate at which we trade-off a unit of consumption in the future for one today, assuming no growth in the amount of goods and services produced by the economy. The correct value for this parameter is the subject of much debate. For example, this lies at the heart of the debate over how much we should be willing to spend today to limit the worst effects of climate change in the future. In our analysis, we assume the long-term average time preference rate is two percent per year.

However, it is not the case that the economy does not grow; hence, the risk free rate we require also should reflect the fact that there will be more goods and services available in the future than there are today. Assuming investors try to smooth their consumption over time, the risk free rate should also contain a term that takes the growth rate of the economy into account. Broadly speaking, this growth rate is a function of the increase in the labor supply and the increase in labor productivity. However, the latter comes from both growth in the amount of capital per worker and from growth in "total factor productivity", which is due to a range of factors, including better organization, technology and education. Since capital/worker cannot be

increased without limit, over the long-run it is growth in total factor productivity that ultimately drives the increase in productivity. Hence, in our analysis, we assume that future economic growth reflects the growth in the labor force and TFP.

Unfortunately, future economic growth is not guaranteed; there is an element of uncertainty involved. Therefore we also need to take investors' aversion to risk and uncertainty into account when estimating the risk free rate of return they should require in exchange for letting others use their capital for one year. There are many ways to measure this, and unsurprisingly, many people disagree on the right approach to use. In our analysis, we have used Constant Relative Risk Aversion with an average value of three (see "How Risk Averse are Fund Managers?" by Thomas Flavin). The following table brings all these factors together to determine our estimate of the risk free rate investors in different currency zones should logically demand in equilibrium (for an excellent discussion of the issues noted above, and their practical importance, see "The Stern Review of the Economics of Climate Change" by Martin Weitzman):

Region	Labor Force Growth %	TFP Growth %	Steady State Econ Growth %	Std Dev of Econ Growth Rate %	Time Preference %	Risk Aversion Factor	Risk Free Rate Demanded* %
Australia	1.0	1.20	2.2	1.1	1.0	3.0	2.2
Canada	0.8	1.00	1.8	0.9	1.0	3.0	2.8
Eurozone	0.4	1.20	1.6	0.8	1.0	3.0	2.9
Japan	-0.3	1.20	0.9	0.5	1.0	3.0	2.8
United Kingdom	0.5	1.20	1.7	0.9	1.0	3.0	2.8
United States	0.8	1.20	2.0	1.0	1.0	3.0	2.5

- The risk free rate equals time preference plus (risk aversion times growth) less (.5 times risk aversion squared times the standard deviation of growth squared).

The next table compares this long-term equilibrium real risk free rate with the real risk free return that is currently supplied in the market. Negative spreads indicate that real return bonds are currently overvalued, as their prices must fall in order for their yields

(i.e., the returns they supply) to rise. The valuation is based on a comparison of the present values of ten year zero coupon bonds offering the rate demanded and the rate supplied, as of **31 Dec 10**:

Region	Risk Free Rate Demanded	Actual Risk Free Rate Supplied	Difference	Overvaluation (>100) or Undervaluation (<100)
Australia	2.2	2.7	0.6	95
Canada	2.8	1.1	-1.7	118
Eurozone	2.9	1.7	-1.2	112
Japan	2.8	1.1	-1.7	118
United Kingdom	2.8	0.5	-2.4	126
United States	2.5	1.1	-1.4	115

Note that in this analysis we have conservatively used 1%, rather than our normal 2%, as the rate of time preference. This is consistent with recent research findings that as investors' sense of uncertainty increases, they typically reduce their time preference discount rate – that is, they become less impatient to consume, and more willing to save (see, for example, “Uncertainty Breeds Decreasing Impatience” by Epper, Fehr-Duda, and Bruhin). Given our conservative time preference assumption, it is interesting to speculate what accounts for the current situation in which yields on real return bonds are significantly lower than what our model would suggest. Logically, answer must lie in some combination of reduced expectations for future economic growth, higher variability of future economic growth rates, and/or higher average levels of risk aversion.

Finally, we also recognize that certain structural factors can also affect the pricing (and therefore yields) of real return bonds. For example, some have argued that in the U.K., the large number of pension plans with liabilities tied to inflation has created a permanent imbalance in the market for index-linked gilts, causing their returns to be well below those that models (such as ours) suggest should prevail. A similar set of conditions may be developing in the United States, particularly as demand for inflation hedging assets increases. Finally, valuation of real return bonds is

---

further complicated by deflation, which affects different instruments in different ways. For example, US TIPS and French OATi adjust for inflation by changing the principal (capital) value of the bond. However, they also contain a provision that the redemption value of the bond will not fall below its face value; hence, a prolonged period of deflation could produce significant real capital gains (this is known as the “deflation put”). In light of these considerations, we have a neutral view on the valuation of real return bonds in all currency zones.

### Government Bonds

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 historical average inflation between 1989 and 2003 plus a premium for inflation uncertainty. We use the latter two variables as a proxy for the average rate of inflation likely to prevail over a long period of time. 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 31 Dec 10*

	<b>Current Real Rate</b>	<b>Average Inflation (89-03)</b>	<b>Inflation Uncertainty Premium</b>	<b>Required Nominal Return</b>	<b>Nominal Return Supplied (10 year Govt)</b>	<b>Return Shortfall or Excess</b>	<b>Asset Class Over or (Under) Valuation, based on 10 year zero coupon</b>	<b>Implied Annual Inflation Over 10 Year Horizon</b>
Australia	2.72%	2.96%	0.25%	5.93%	5.52%	-0.41%	<b>3.91%</b>	2.48%
Canada	1.08%	2.40%	0.25%	3.73%	3.12%	-0.61%	<b>6.07%</b>	1.77%
Eurozone	1.74%	2.37%	0.25%	4.36%	2.96%	-1.40%	<b>14.42%</b>	0.95%
Japan	1.09%	0.77%	0.25%	2.11%	1.12%	-0.99%	<b>10.27%</b>	-0.22%
UK	0.48%	3.17%	0.25%	3.90%	3.40%	-0.50%	<b>4.94%</b>	2.66%
USA	1.10%	2.93%	0.25%	4.28%	3.29%	-0.99%	<b>10.03%</b>	1.91%
Switzerland	1.37%	2.03%	0.25%	3.65%	1.74%	-1.91%	<b>20.41%</b>	0.12%
India	1.37%	7.57%	0.25%	9.19%	8.14%	-1.05%	<b>10.14%</b>	6.43%

\*For Switzerland and India, we use the average of real rates in other regions with real return bond markets

It is important to note some important limitations of this analysis. Our bond market analysis uses historical inflation as an estimate of expected future inflation over the long-term. This may not produce an accurate valuation estimate, if the historical average level of inflation is not a good predictor of future average inflation levels. This risk is especially acute today, when the world economy is operating in uncharted waters, and faces both deflationary pressures (from falling demand relative to productive capacity, and significant debt servicing problems in the private sector) and inflationary pressures (from unprecedented peacetime government deficits, that are largely being financed by central banks under the “quantitative easing” programs). Under these circumstances, one could argue that many nominal return government bonds might in fact be underpriced today, over a shorter time horizon (more likely to experience deflation), while overpriced over a longer time horizon (that is more likely to see higher levels of inflation – e.g., see the recent IMF study, “Fiscal Deficits, Public Debt, and Sovereign Bond Yields” by Baldacci and Kumar). As we like to point out, in the absence of public policy interventions, overindebtedness on the part of private

borrowers typically results in widespread bankruptcies and deflation caused by the accelerating liquidation of collateral. In contrast, overindebtedness on the part of governments more often results in some combination of inflation and exchange rate depreciation (e.g., look at the history of Argentina, which we know all too well).

The following two pieces of information may help your to put the current situation in perspective. The last column of the table above shows the average annual inflation rate implied by the current spread between ten-year nominal rates and average real rates (note that research has shown that the real yield curve tends to be quite flat, which is consistent with economic theory). As you can see, apart from Japan and India, government bond markets do not appear to be incorporating either deflation or levels of inflation substantially above historical norms. This is not consistent with our view of how the future is likely to unfold. On the one hand, this may be due to wishful thinking by some investors. On the other hand, it may reflect efforts by central banks to maintain interest rates at a constant level, to maximize the impact of fiscal stimulus programs on aggregate demand.

The second piece of information that can help to put our government bond valuation analysis into a larger context is presented in the following table. It shows historical average inflation rates (and their standard deviations) for the U.K. and U.S. over very long periods of time:

	<i>U.K.</i>	<i>U.S.</i>
<i>Avg. Inflation, 1775-2007</i>	2.19%	1.62%
Standard Deviation	6.60%	6.51%
<i>Avg. Inflation, 1908-2007</i>	4.61%	3.29%
Standard Deviation	6.24%	5.03%
<i>Avg. Inflation, 1958-2007</i>	5.98%	4.11%
Standard Deviation	5.01%	2.84%

Assuming inflation levels revert to their long-term averages over a long time horizon, many government bond markets appear overpriced today (i.e., prevailing nominal yields appear to be too low). However, over a short-term time horizon, it may well be the case that many countries will first experience declining prices (deflation) before

---

they experience a substantial rise in inflation. From this perspective, government bonds may be underpriced over the expected time horizon for deflation, but overpriced in the context of the substantial reflations that governments will eventually attempt (given that the economic consequences of deflation seem to be much worse than those associated with higher than normal inflation). In sum, when it comes to questions about bond market valuation, one's time horizon assumption is critical.

### Credit Spreads

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 primarily reflects 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 BAA and AAA rated bonds, which tells us more about the level of compensation required by investors for bearing relatively high quality credit risk. Research has also shown that credit spreads on longer maturity intermediate risk bonds has predictive power for future economic demand growth, with a rise in spreads signaling a future fall in demand (see "Credit Market Shocks and Economic Fluctuations" by Gilchrist, Yankov, and Zakrajsek).

The following table shows the statistics of the distribution of these spreads between January, 1986 and December, 2009. The average standard deviation measures the extent to which observed values vary around the average; about 67% of the time, the outcome should be within one standard deviation, assuming the outcomes are normally distributed (i.e., have a "bell curve" shape); 95% of the time, the outcome should be within two standard deviations. Skewness measures the extent to which the distribution is non-symmetrical around the mean (i.e., departs from the normal distribution); a normal distribution has skewness equal to zero. Positive values indicate that more than half the outcomes are above the average. Kurtosis measures the extent to which a distribution has more or fewer extreme outcomes than

a normal distribution, or, put differently, the extent to which the size of the variance (the standard deviation squared) is driven by extreme outcomes. Kurtosis above zero indicates that a distribution has more extreme outcomes than a normal distribution.

Particularly in the case of the BAA spread, it is clear we are not dealing with a normal distribution!

	<b>AAA – 10 Year Treasury</b>	<b>BAA-AAA</b>
Average	1.24	0.98
Standard Deviation	.47	.42
Skewness	0.90	3.00
Kurtosis	0.39	12.29

At **31 Dec 10**, the AAA minus 10 year Treasury spread was 1.59%. The AAA minus BAA spread was 1.10%. Since the distributions of AAA and BAA credit spreads are not normal (i.e., they do not have a “bell curve” shape), we need to look at history rather than Gaussian (normal curve) statistics to put them into perspective. Over the past twenty-four years, about 20% of all trading days had a higher AAA-Treasury spread. Over the same period, about 27% of all trading days had a higher AAA-BBB spread.

Over a longer-term time horizon, when liquidity and credit risk premiums would be expected to return to their historical averages, one can argue that credit is underpriced today, given high prevailing yields (i.e., falling bond yields mean rising bond prices). However, the validity of that conclusion critically depends on one’s assumptions about future default rates and loss rates conditional upon default. A decision to buy 50,000 in bonds at what appears to be a very attractive yield from a long-term perspective can still generate negative total returns if the future default rate (and losses conditional upon default) more than wipes out the apparently attractive extra yield. And since the differences between current AAA and BBB spreads and their long-term averages (those averages being 1.24% and .98%, respectively) are

---

well under 100 basis points today, it doesn't take much mis-estimation of future default rates (and/or losses conditional on default) to turn today's apparently good decision into tomorrow's painful outcome. And the "historically attractive yields" argument gets (non-linearly) less convincing the further down the credit ratings ladder you go. On balance, we think that even on a long-term view, credit likely overpriced today, given the increasingly uncertain economic outlook and difficulty in accurately estimating future default and loss given default rates.

### Currencies

Let us now turn to currency prices and valuations. 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, especially over short periods of time (for a logical approach to forecasting equilibrium exchange rates over longer horizons, see "2009 Estimates of Fundamental Equilibrium Exchange Rates" by Cline and Williamson).

In our case, 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 (for an excellent analysis of the sources of carry trade profits – of which 25% may represent a so-called "disaster risk premium", see "Crash

Risk in Currency Markets” by Farhi, Frailberger, Gabaix, Ranciere and Verdelhan). 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 31 Dec 10*

	To AUD	To CAD	To EUR	To JPY	To GBP	To USD	To CHF	To INR
From								
<b>AUD</b>	0.00%	-2.40%	-2.56%	-4.40%	-2.12%	-2.23%	-3.78%	2.62%
<b>CAD</b>	2.40%	0.00%	-0.16%	-2.00%	0.28%	0.17%	-1.38%	5.02%
<b>EUR</b>	2.56%	0.16%	0.00%	-1.84%	0.44%	0.33%	-1.22%	5.18%
<b>JPY</b>	4.40%	2.00%	1.84%	0.00%	2.28%	2.17%	0.62%	7.02%
<b>GBP</b>	2.12%	-0.28%	-0.44%	-2.28%	0.00%	-0.11%	-1.66%	4.74%
<b>USD</b>	2.23%	-0.17%	-0.33%	-2.17%	0.11%	0.00%	-1.55%	4.85%
<b>CHF</b>	3.78%	1.38%	1.22%	-0.62%	1.66%	1.55%	0.00%	6.40%
<b>INR</b>	-2.62%	-5.02%	-5.18%	-7.02%	-4.74%	-4.85%	-6.40%	0.00%

### Commercial Property

Our approach to valuing commercial property securities as an asset class is also based on the expected supply of and demand for returns, utilizing the same mix of fundamental and investor behavior factors we use in our approach to equity valuation. Similar to equities, the supply of returns equals the current dividend yield on an index covering publicly traded commercial property securities, plus the expected real growth rate of net operating income (NOI). A number of studies have found that real NOI growth has been basically flat over long periods of time (with apartments showing the strongest rates of real growth). This is in line with what economic theory predicts, with increases in real rent lead to an increase in property supply, which eventually causes real rents to fall. However, it is entirely possible – as we have seen in recent months – that rents can fall sharply over the short term during an economic downturn.

Our analysis also assumes that over the long-term, investors require a 3.0% risk premium above the yield on real return bonds as compensation for bearing the risk

of securitized commercial property as an asset class. Last but not least, there is significant research evidence that commercial property markets are frequently out of equilibrium, due to slow adjustment processes as well as the interaction between fundamental factors and investors' emotions (see, for example, "Investor Rationality: An Analysis of NCREIF Commercial Property Data" by Hendershott and MacGregor; "Real Estate Market Fundamentals and Asset Pricing" by Sivitanides, Torto, and Wheaton; "Expected Returns and Expected Growth in Rents of Commercial Real Estate" by Plazzi, Torous, and Valkanov; and "Commercial Real Estate Valuation: Fundamentals versus Investor Sentiment" by Clayton, Ling, and Naranjo). Hence, it is extremely hard to forecast how long it will take for any over or undervaluations we identify to be reversed. The following table shows the results of our valuation analysis as of **31 Dec 10**: We use the dividend discount model approach to produce our estimate of whether a property market is over, under, or fairly priced today, assuming a long-term perspective on property market valuation drivers. The specific formula is  $(\text{Current Dividend Yield} \times 100) \times (1 + \text{Forecast NOI Growth})$  divided by  $(\text{Current Yield on Real Return Bonds} + \text{Property Risk Premium} - \text{Forecast NOI Growth})$ . Our estimates are shown in the following tables, where a value greater than 100% implies overpricing, and less than 100% implies underpricing.

Country	Dividend Yield	Plus LT Real Growth Rate	Equals Supply of Returns	Real Bond Yield	Plus LT Comm Prop Risk Premium	Equals Returns Demanded	Over or Undervaluation (100% = Fair Value)
Australia	5.7%	0.2%	5.9%	2.7%	3.0%	5.7%	97%
Canada	4.7%	0.2%	4.9%	1.1%	3.0%	4.1%	83%
Eurozone	4.6%	0.2%	4.8%	1.7%	3.0%	4.7%	98%
Japan	5.7%	0.2%	5.9%	1.1%	3.0%	4.1%	68%
Switzerland*	3.0%	0.2%	3.2%	1.4%	3.0%	4.4%	141%
U.K.	4.2%	0.2%	4.4%	0.5%	3.0%	3.5%	78%
U.S.A.	3.9%	0.2%	4.1%	1.1%	3.0%	4.1%	99%

*\*Using the current dividend yield, the valuation of the Swiss property market appears to be significantly out of line with the others. Hence, our analysis is based on the*

---

*estimated income yield on directly owned commercial property in Switzerland instead of the dividend yield on publicly traded property securities.*

As you can see, on a long-term view, few commercial property markets look underpriced today. Over the next twelve months, however, we believe the balance of risks points in a negative direction. Consumer spending remains weak in many markets, occupancy rates are declining, rents are stagnant at best, and landlords continue to struggle with debt refinancings (indeed, the press is full of stories about the declining quality of commercial mortgage backed securities). It is hard to see how government fiscal stimulus, strong though it is, will improve this situation very much, as long as the underlying problems – high consumer leverage, a weak financial system, and continuing international imbalances – remain unresolved. Moreover, the development of real return bond and commodity markets has weakened, to some extent, property's traditional attraction as an inflation hedge. While these factors tend to undermine one source of support for property prices, we also recognize that, at least in some markets, they can be offset by property's historical attraction as a means of preserving wealth in very difficult and uncertain times. In sum, we believe that the sharp run up in property security prices in recent months is due to some combination of investor over-optimism about the speed and size of economic recovery, and/or the tendency of institutional investors to herd rather than risk losing assets (or their jobs) due to their underperforming an asset class benchmark. Switzerland and the Eurozone may be exceptions to this view, in that rising uncertainty may have triggered increased demand for property in these markets.

### Commodities

Let us now turn to the Dow Jones AIG Commodity Index (now known as the DJ UBS Commodity Index), our preferred benchmark for this asset class because of the roughly equal weights it gives to energy, metals and agricultural products. One of our core assumptions is that financial markets function as a complex adaptive system

---

which, while attracted to equilibrium (which generates mean reversion) are seldom in it. To put it differently, we believe that investors' expectations for the returns an asset class is expected to supply in the future are rarely equal to the returns a rational long-term investor should logically demand. Hence, rather than being exceptions, varying degrees of over and under pricing are simply a financial fact of life. We express the demand for returns from an asset class as the current yield on real return government bonds (ideally of intermediate duration) plus an appropriate risk premium. While the former can be observed, the latter is usually the subject of disagreement. In determining the risk premium to use, we try to balance a variety of inputs, including historical realized premiums (which may differ considerably from those that were expected, due to unforeseen events), survey data and academic theory (e.g., assets that payoff in inflationary and deflationary states should command a lower risk premium than those whose payoffs are highest in "normal" periods of steady growth and modest changes in the price level). In the case of commodities, Gorton and Rouwenhorst (in their papers "Facts and Fantasies About Commodity Futures" and "A Note on Erb and Harvey") have shown that (1) commodity index futures provide a good hedge against unexpected inflation; (2) they also tend to hedge business cycle risk, as the peaks and troughs of their returns tend to lag behind those on equities (i.e., equity returns are leading indicators, while commodity returns are coincident indicators of the state of the real business cycle); and (3) the realized premium over real bond yields has historically been on the order of four percent. We are inclined to use a lower ex-ante risk premium in our analysis (though reasonable people can still differ about what it should be), because of the hedging benefits commodities provide relative to equities. This is consistent with the history of equities, where realized ex-post premiums have been shown to be larger than the ex-ante premiums investors should logically have expected.

The general form of the supply of returns an asset class is expected to generate in the future is its current yield (e.g., the dividend yield on equities), plus the rate at which this stream of income is expected to grow in the future. The key challenge with applying this framework to commodities is that the supply of commodity returns

---

doesn't obviously fit into this framework. Broadly speaking, the supply of returns from an investment in commodity index futures comes from four sources. First, since commodity futures contracts can be purchased for less than their face value (though the full value has to be delivered if the contract is held to maturity), a commodity fund manager doesn't have to spend the full \$100 raised from investors to purchase \$100 of futures contracts. The difference is invested – usually in government bonds – to produce a return.

The second source of the return on a long-only commodity index fund is the so-called “roll yield.” Operationally, a commodity index fund buys futures contracts in the most liquid part of the market, which is usually limited to the near term. As these contracts near their expiration date, they are sold and replaced with new futures contracts. For example, a fund might buy contracts maturing in two or three months, and sell them when they approached maturity. The “roll yield” refers to the gains and losses realized by the fund on these sales. If spot prices (i.e., the price to buy the physical commodity today, towards which futures prices will move as they draw closer to expiration) are higher than two or three-month futures, the fund will be selling high and buying low, and thus earning a positive roll yield. When a futures market is in this condition, it is said to be in “backwardation.” On the other hand, if the spot price is lower than the two or three month's futures price, the market is said to be in “contango” and the roll yield will be negative (i.e., the fund will sell low and buy high). The interesting issue is what causes a commodity to be either backwardated or contangoed. A number of theories have been offered to explain this phenomenon. The one that seems to have accumulated the most supporting evidence to date is the so-called “Theory of Storage”: begins with the observation that, all else being equal, contango should be the normal state of affairs, since a person buying a commodity at spot today and wishing to lock in a profit by selling a futures contract will have to incur storage and financing costs. In addition to his or her profit margin, storage and financing costs should cause the futures price to be higher than the spot price, and normal roll yields to be negative.

However, in the real world, all things are not equal. For example, some commodities are very difficult or expensive to store; others have very high costs if you run out of them (e.g., because of rapidly rising demand relative to supply, or a potential disruption of supply). For these commodities, there may be a significant option value to holding the physical product (the Theory of Storage refers to this option value as the “convenience yield”). If this option value is sufficiently high, spot prices may be bid up above futures prices, causing “backwardation” and positive roll-yields for commodity index funds. Hence, a key question is the extent to which different commodities within a given commodity index tend to be in backwardation or contango over time. Historically, most commodities have spent time in both states. However, contango has generally been more common, but not equally so for all commodities. For example, oil has spent relatively more time in backwardation, as have copper, sugar, soybean meal and lean hogs. Moreover, because of changing supply and demand conditions in many physical commodity markets (e.g., global demand has been growing, while marginal supplies are more expensive to develop and generally have long lead times), it is not clear that historical tendencies toward backwardation or contango are a good guide to future conditions.

To the extent that any generalizations can be made, higher real option values, and hence backwardation and positive roll returns are more likely to be found when demand is strong and supplies are tight, and/or when there is a rising probability of a supply disruption in a commodity where storage is difficult. For example, ten commodities make up roughly 75% of the value of the Dow Jones AIG Commodities Index. The current term structures of their futures curves are as follows on **31 Dec 10**:

<b>Commodity</b>	<b>DJAIG Weight</b>	<b>Current Status</b>
Crude Oil	13.8%	Contango
Natural Gas	11.9%	Contango
Gold	7.9%	Contango
Soybeans	7.6%	Contango
Copper	7.3%	Neutral
Aluminum	7.0%	Contango
Corn	5.7%	Contango

---



---

<b>Commodity</b>	<b>DJAIG Weight</b>	<b>Current Status</b>
Wheat	4.8%	Contango
Live Cattle	4.3%	Contango
Unleaded Gasoline	3.7%	Contango
	<i>74.0%</i>	

However (and this is a critical however), this Theory of Storage analysis assumes that there is no change in the relative supply of investors willing to purchase futures contracts sold by commodity producers. This assumption has been violated in recent years, which have seen a dramatic increase in the amount of investment committed to long-only commodity futures based index funds. Some observers have argued that this increase in demand for commodity futures has overwhelmed any changes that have taken place on the supply side that are driven by the Theory of Storage. They conclude that this has resulted in a permanent change in the structure of many commodity futures markets that has made contangoed conditions, and hence negative roll returns, much more likely. We are persuaded of the logic of this argument, which is why in our model portfolios we now use products (e.g., the ETF LSC), that can take both long and short positions in commodity futures, based on market supply and demand conditions as evaluated by an algorithm (technically, this produces an index that the fund tracks; however, for all intents and purposes, these are active quantitative strategies).

Given the continued presence of so many contangoed futures curves, expected near term roll returns on the DJAIG as a whole are still negative, absent major supply side shocks. On a weighted basis (using the DJAIG weights), the forward premium (relative to the spot price) at **31 Dec 10** was 0.64%, compared to 1.09% one month previously, 1.51% two months ago, and 1.64% three months ago. Remember, a forward premium means the roll return will be negative (because the futures investor will be selling the maturing contract at a lower price than he or she must pay to replace it with a longer-dated contract). Roll returns are positive only when there is a forward discount (when the average price of a futures contract with a long maturity is lower than the price of a contract with a very short maturity).

---

This brings us to the third source of return for long-only commodity futures funds: unexpected changes in the price of the commodity during the term of the futures contract. It is important to stress that the market's prevailing consensus about the expected change in the spot price is already included in the futures price that is paid when the contract is purchased. The source of return we are referring to here is the portion of the final realized price change that was unexpected when the futures contract was purchased. Given the large increase in funds committed to long-only, commodity futures based index investments, unexpected price changes have become a much more important source of return than they have been in the past. The good news is that this return driver probably offers skilled active investors the best chance of making profitable forecasts, since most human beings find it extremely difficult to accurately understand situations where cause and effect are significantly separated in time (e.g., failure to recognize how fast rising house prices would – albeit with a time delay – trigger an enormous increase in new supply). In this regard, large price surprises seem to be more frequent when supply and demand for a commodity are finely balanced – the same conditions which can also give rise to changes in real option values and positive roll returns, under the Theory of Storage. However, given our economic outlook, at this point in time we view negative surprises on the demand side that depress commodity prices as more likely than demand or supply surprises that have the opposite effect. Put differently, on balance we expect price surprises to have a negative impact on commodity returns over the next year.

The fourth source of returns for a diversified commodity index fund is generated by rebalancing a funds portfolio of futures contracts back to their target commodity weightings as prices change over time. This is analogous to an equity index having a more attractive risk/return profile than many individual stocks. This rebalancing return will be higher to the extent that price volatilities are high, and the correlations of price changes across commodities are low. Historically, this rebalancing return has been estimated to be around 2% per year, for an equally weighted portfolio of different commodities. However, as correlations have risen in recent years, the size of this return driver has probably declined – say to 1% per year.

---

So, to sum up, the expected supply of returns from a commodity index fund over a given period of time equals (1) the current yield on real return bonds, reduced by the percentage of funds used to purchase the futures contracts; (2) expected roll yields, adjusted for commodities' respective weights in the index; (3) unexpected spot price changes; and (4) the expected rebalancing return. Of these, the yield on real return bonds can be observed, and we can conservatively assume a long-term rebalancing return of, for example, 1.0%. These two sources of return are clearly less than the demand for returns that are equal to the real rate plus a risk premium of, say, 3.0%. The difference must be made up by a combination of roll returns (which, given the current shape of futures curves, are likely to be negative in the near term) and unexpected price changes, due to unanticipated changes in demand (where downside surprises currently seem more likely than upside surprises) and/or unanticipated changes in supply conditions (e.g., incomplete investor recognition of slowing oil production from large reservoirs, a major disruption due to war/terrorism or a significant accident, discovery of significant new deposits, or a major breakthrough that makes biofuels much more cost competitive). On balance, at **31 Dec 10**, we believe that returns on many commodity futures are more likely to be negative over the next year than positive; hence, using this analytical framework we conclude that commodities are likely overpriced today, using a one-year time horizon.

Another approach to assessing the valuation of commodities as an asset class is to compare the current value of the DJAIG Index to its long-term average. Between 1991 and 2009, the inflation adjusted (i.e., real) DJAIG had an average value of 90.99, with a standard deviation of 15.92 (skewness of .57, and kurtosis of -.07; i.e., it was close to a normal distribution). The inflation adjusted **31 Dec 10** closing value of 101.31 was an estimated .65 standard deviations above the long term average. Assuming the value of the index is normally distributed around its historical average (which in this case is approximately correct), a value within one standard deviation of the average should occur about 67% of the time, and a value within two standard deviations 95% of the time.

---

Whether the current level of the inflation adjusted DJAIG signifies that commodities are undervalued depends upon the time horizon being used. There are three arguments that, on a medium term (three to five year) view, commodities are underpriced today. The first is the large amount of monetary easing underway in the world, which, at some point, could lead to higher inflation. The second is the recovering growth in the world economy, which is causing demand for many commodities to bump up against supply side constraints (because it takes time to increase the supply of most commodities, in the short term increases in demand beyond a certain point trigger rapid price increases). The third is that the possibility that we will see a substantial fall in the value of the US Dollar versus other currencies, causing investors to increase their holdings of commodities as confidence in fiat currencies wanes.

The argument that commodities are overpriced today on a medium term view is based on the belief that (a) investment in clean fuels and the electrification of an increasing share of the transport sector will cause a permanent reduction in global demand for oil relative to supply (and oil receives a relatively heavy weight in most commodity indexes); (b) The inability to quickly resolve the economic challenges facing the world economy will result in a prolonged period of weak or no growth (including a major slowdown in Chinese growth), which will reduce the demand for commodities; and (c) That in a scenario of prolonged global stagnation, investors will prefer to increase their holdings of short term government bonds, and perhaps gold, rather than increasing their holdings of a broader range of commodities.

On balance, we continue believe that, over the next three to five years, a fall in global aggregate demand is more likely than an inflation and/or US Dollar crisis, as the High Uncertainty Regime typically sees a flight into U.S. dollars rather than a flow out of them. On that basis, we conclude that, over this time horizon, commodities are likely overpriced today.

---

---

## Gold

Our approach to asset pricing theory is based on a few key assumptions: (1) Asset prices reflect the interaction of the supply of and demand for real returns from a given asset class; (2) The supply of returns reflects the current yield provided by an asset class, plus expected changes in its price over a given period of time; (3) The demand for returns reflects the prevailing real risk free rate plus a required risk premium; (4) Imbalances between the supply of and demand for returns are normal feature of asset markets; (5) While asset markets are drawn to an equilibrium where the supply of returns equals the demand for returns, they can operate far from equilibrium for extended periods of time; and (6) Asset markets return to equilibrium due to changes in all four underlying variables – the current yield of the asset, expectations for future price changes, the real risk free interest rate, and required risk premiums.

In an article in our January 2010 issue, we described why we would expect the real price of gold to increase by about 1.75% per year under normal conditions. This is the difference between our assumed long-term growth rate of real global GDP of 3.25% per year and our assumed long-term growth rate of the world stock of gold of 1.50% per year. We can further expand our description of the supply of gold returns, viewing 1.75% per year as the normal “income return” from holding gold, and adding to it the change in the price of gold that is driven by regime changes – i.e., changes in perceived uncertainty and expected inflation.

When we looked at the return for holding gold that an investor would logically demand, in terms of a risk premium above the real risk free interest rate, we found that it varied considerably depending on the regime that prevailed. In normal times, the risk premium has been negative (about 2.0% annually), reflecting the fact that gold plays the role of portfolio insurance, for which, in normal times, an investor should logically expect to pay, rather than receive, a risk premium. However, this insurance policy is expected to pay off under the high inflation and high uncertainty regimes, when the

---

risk premium above the real risk free rate turns positive, ranging between 2.5% in the high inflation regime to 2.0% in the high uncertainty regime.

We thus have a fully specified (if still rough) supply and demand equation for gold returns, with the return supplied equal to 1.75% plus changes in price caused by a perceived or expected change in regime, and the return demanded equal to the risk free rate plus the required risk premium, with the latter also varying under different regimes.

This raises the obvious question of how these variables change to restore the system to equilibrium when supply and demand are out of balance. That is not an easy question to answer. Under the normal (steady state) regime, the supply/demand balance is defined by the difference between 1.75% and the risk free rate less the “insurance premium” investors are willing to pay for gold. If the latter sum is greater than 1.75%, the price of gold should tend to increase. If it is less than 1.75%, the real price of gold should fall. So far, so good – and, more important, usually quite a stable return generating process. However, when the system shifts out of the normal regime, the relationship between the supply of and demand for returns from holding gold gets considerably more exciting. On the demand side there is a shift from a negative required risk premium to a positive risk premium, as the portfolio insurance provided by gold is expected to pay off. On the supply side, that should cause prices to rise by more than their long-term normal regime rate of 1.75% per year. The excitement comes when that price increase triggers investor herding, and the price increase exceeds the amount required to match the supply of returns to the demand for returns. As the system is driven further away from equilibrium, with the apparent supply of gold returns exceeding the fundamental demand for gold returns by ever-greater amounts, it becomes more fragile, as maintaining a constant annual percentage increase in price of gold requires ever larger annual dollar increases in the price of gold. Eventually the system is driven back towards equilibrium, via a sharp decline in the price of gold.

We have also noted our view that gold is ultimately a hedge against declining trust in short term U.S. Treasury Bills (and, for some investors, the U.S. Dollar) as the

---

safest and most liquid means of preserving the real value of one's wealth. But consider what happens to the gold supply/demand equation if that trust is eroded. In terms of the supply of returns, the price of gold is driven up, and with it the associated annual return from holding it. But on the demand side, declining faith in U.S. Treasuries should logically lead to a decline in the risk premium investor require to hold gold even under the high uncertainty or high inflation regimes. In this manner, declining faith in Treasuries only worsens the imbalance between the supply of and demand for returns from holding gold, and causes the gold asset pricing system to become more fragile, likely in a non-linear manner. The process should then reverse (perhaps violently) when either confidence in U.S. Treasuries and the U.S. Dollar is restored, or when the securities and currency of another country replace those issues by the United States as the world's long-term, liquid store of value. At the very least, this dynamic suggests that a commitment to systematic portfolio rebalancing is a critical requirement for anyone choosing to use gold as an asset class (as opposed to adding gold coins to the mix of currencies they hold to meet their need for liquidity and precautionary savings, rather than long-term investment needs). Moreover, our analysis also shows that, if one wants to make a long-term allocation to gold as a type of portfolio insurance, the right time to add it to a portfolio is when its price is very cheap, and not when its price has started to rapidly increase.

At **31 Dec 10**, the yield on a 10-year USD real return bond was 1.00%, and we believe that the chances are high we are not in the normal regime, but rather in a situation in which most investors expect gold to pay a positive risk premium. So the real return demanded for holding gold should be around 3.50% per year. According to our approach, fair valuation of gold would require that the expected supply of real gold returns be of the same magnitude. However, over the last 12 months, the actual real return from holding gold (calculated using the change in the GLD ETF less the change in the US CPI) has been about 27%.

The recent pause in the accelerating upward climb in gold prices further reinforces the impression that the gold market may indeed be in a very fragile state. Conditions in the gold futures market further reinforce this view. Over the past few

---

months, gold futures have become much less contangoed, with a recent forward premium (based on the price difference between the two nearest month contracts) of only .22%. While further negative surprises that raise perceived uncertainty could yet drive gold prices higher (the most powerful of which would be increased worries about the creditworthiness of U.S. Treasury securities), we conclude that at present gold is likely overpriced today, based on our fundamental valuation methodology. That said, when the inevitable price decline will occur is anybody's guess. This is very much a "beat the gun" market.

### Timber

The underlying diversification logic for investing in timber is quite simple: the key return driver is biological growth, which has essentially no correlation with factors driving returns on other asset classes. That said, the correlation of timber returns with other asset classes should be different from zero, as it also depends on the price of timber products (which depends, in part, on GDP growth) as well as changes in real interest rates and investor behavior – factors affect returns on other asset classes as well as timber.

However, in valuing timber as a global asset class, we face a number of significant challenges. First, the underlying assets are not uniform – they are divided between softwoods and hardwoods, at different stages of maturity, located in different countries, face different supply conditions (e.g., development, harvesting, and environmental regulations and pest risks), and different demand conditions in end-user markets. Second, the majority of investment vehicles containing these assets are illiquid limited partnerships, and the few publicly traded timber investment vehicles (e.g., timber REITs) provide insufficient liquidity to serve as the basis for indexed investment products. Finally, the two indexes that attempt to measure returns from timberland investing (the NCREIF Index in North America, and IPD Index in Europe) are regional in coverage and utilize an appraisal based valuation methodology based on timber limited partnerships, which tends to understate the volatility of returns and

---

their correlation with other asset classes. Given these challenges, the result of any valuation estimate for timber as a global asset class must be regarded as, at best, a rough approximation.

Our valuation approach is based on two timber REITs that are traded in the United States: Plum Creek (PCL) and Rayonier (RYN). We chose this approach because both of these REITs are liquid, publicly traded vehicles, and both derive most of their revenues from their timberland operations. This avoids many of the problems created by appraisal-based approaches such as the NCREIF and IPD indexes. That said, for the reasons noted above, this approach is still far from a perfect solution to the asset class valuation problem presented by timber.

As in the case of equities, we compare the returns that a weighted mix of PCL and RYN 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). We note that, since PCL and RYN are listed securities, investors should not demand a liquidity premium for holding them, as they would in the case of an investment in a TIMO Limited Partnership (Timber Management Organization). Two of the variables we use in our valuation analysis are readily available: the dividend yields on the timber REITS and the yield on real return bonds. The other two variables, the expected rate of growth and the appropriate risk premium, have to be estimated. The former presents a particularly difficult challenge.

In broad terms, the rate of dividend growth results from the interaction of physical, economic, and regulatory processes. Physically, trees grow, adding a certain amount of mass each year. The exact rate depends on the mix of trees (e.g., southern pine grows much faster than northern hardwoods), on silviculture techniques employed (e.g., fertilization, thinning, etc.), and weather and other natural factors (e.g., fires, drought, and beetle invasions). Another aspect of the physical process is that a certain number of trees are harvested each year, and sold to provide revenue to the timber REIT. A third aspect of the physical process is that trees are exposed to certain

---

risks, such as fire, drought, or disease (e.g., the mountain pine beetle in the northwest United States and Canada). And fourth physical process is that, through photosynthesis, trees sequester a portion of the carbon dioxide that would otherwise be added to the earth's atmosphere.

In the economic area, three processes are important. First, as trees grow, they can be harvested to make increasingly valuable products, starting with pulpwood when they are young, and sawtimber when they reach full maturity. This value-increasing process is known as "in-growth." The speed and extent to which in-growth occurs depends on the type of tree; in general, this process produces greater value growth for hardwoods (whose physical growth is slower) than it does for pines and other fast-growing softwoods. At the level of individual timber investments, the rate of in-growth is a key driver of returns; however, at the asset class level, we have decided to assume a constant mix of grades over time. The second economic process (or, more accurately, processes) is the interaction of supply and demand that determines changes in real prices for different types and grades of timber. As is true in the case of commodities, there is likely to be an asymmetry at work with respect to the impact of these processes, with prices reacting more quickly to more visible changes in demand, while changes in supply side factors (which only happen with a significant time delay) are more likely to generate surprises. In North America., a good example of this may be the eventual supply side and price impact of the mountain pine beetle epidemic that has been spreading through the northwestern forests of the United States and Canada. The IMF produces a global timber price index that captures the net impact of demand and supply fluctuations. The average annual change in real prices (derived by adjusting the IMF series for changes in U.S. inflation) between 1981 and 2007 was 0.1% (i.e., average prices over the period remained essentially constant in real terms), but with a significant standard deviation of 9.2% -- i.e., it is normal for real timber prices to be quite volatile from year to year.

The third set of economic processes that affects the growth rate of dividends includes changes in a timber REIT's cost structure, and in its non-timber related revenue streams (e.g., proceeds from selling timber land for real estate development

or conservation easements). For example, if wood prices decline, and non-timber sources of revenue dry up (as is happening during the current recession), a timber REIT (or timber LP) will have to either cut operating costs and/or distributions to investors, or increase the physical volume of trees that are harvested.

Regulatory processes also affect the future growth rate for timber REIT dividends. In the past, the most important of these included restrictions on harvesting or land development. In the future, the most important regulatory factor is likely to be the imposition of carbon taxes or a cap and trade systems to limit carbon emissions. These new environmental regulations could provide an additional source of revenue for timber REITs in the future (for an early attempt at establishing the CO2 sequestration value of timberland, see “Economic Valuation of Forest Ecosystem Services” by Chiabai, Traversi, Ding, Markandya and Nunes. For a review of similar studies, see “Estimates of Carbon Mitigation Potential from Agricultural and Forestry Activities” by the U.S. Congressional Research Service).

The following table summarizes the assumptions we make about these physical and economic variables in our valuation model:

<b>Growth Driver</b>	<b>Assumption</b>
Biological growth of trees	We assume 6% as the long term average for a diversified timberland portfolio. We stress that biological growth rates can vary widely for different types of timber investment (with softwoods and timber located in tropical countries delivering the highest growth, and hardwoods and timber in more temperate climates delivering the slowest growth rates). We have also changed our valuation model to assume a constant mix of product grades, to present a better approximation for timber as a global asset class.
Harvesting rate	As a long term average, we assume that 5% of tree volume is harvested each year. As a practical matter, this should vary with

Growth Driver	Assumption
	timber prices and the REITs prevailing dividend level. So 5% is a “noisy” long-term estimate for timber as a global asset class.
Change in prices of timber products	In line with IMF data, we assume that over the long term, average timber prices will just keep pace with inflation. Again, this is a “noisy” estimate, because the IMF data also shows that real prices are highly volatile. Moreover, there are indications that climate change is causing increasing tree deaths in some areas, which should lead to future real price increases (see “Western U.S. Forests Suffer Death by Degrees” by E. Pennisi, <i>Science</i> , 23Jan09). Hence we believe our long-term price change assumption is conservative.
Carbon credits	Until more comprehensive regulations are enacted, we assume no additional return to timberland owners from the CO2 sequestration service they provide (or for timber’s use in various biomass energy applications). Again, given the high level of global concern with limiting the increase in atmospheric CO2 levels, we believe this is a conservative assumption.

This leaves the question of the appropriate return premium that investors should demand to compensate them for bearing the 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, and since timber has displayed a very low correlation with returns on other asset classes (particularly during the worst of the 2008 crisis, even in the case of liquid timber vehicles), we use three percent as the required return premium for investing in liquid timberland assets. Arguably, because a portion of timber’s return generating process (physical growth) has zero correlation with the return generating

processes for other asset classes, we should use an even lower risk premium. Again, we believe our approach is conservative in this regard. Given these assumptions, our assessment of the valuation of the timber asset class at **31 Dec 10** is shown in the following table. We use the dividend discount model approach to produce our estimate of whether timber is over, under, or fairly valued today. The specific formula is  $(\text{Current Dividend Yield} \times 100) \times (1 + \text{Forecast Dividend Growth})$  divided by  $(\text{Current Yield on Real Return Bonds} + \text{Timber Risk Premium} - \text{Forecast Dividend Growth})$ . A value greater than 100% implies overvaluation, and less than 100% implies undervaluation.

Average Dividend Yield (70% PCL + 30% RYN)	4.35%
Plus Long Term Annual Biological Growth	6.00%
Less Percent of Physical Timber Stock Harvested Each Year	(5.00%)
Plus Long Term Real Annual Price Change	0.00%
Plus Other Sources of Annual Value Increase (e.g., Carbon Credits)	0.00%
Equals Average Annual Real Return Supplied	<b><u>5.35%</u></b>
Average Real Return Bond Yield	1.10%
Plus Risk Premium for Timber	3.00%
Equals Average Annual Real Return Demanded	<b><u>4.10%</u></b>
Ratio of Returns Demanded/Returns Supplied Equals Valuation Ratio (less than 100% implies undervaluation)	<b><u>71%</u></b>

We stress that this is a long-term valuation estimate that contains a higher degree of uncertainty than valuation estimates for larger and more liquid asset classes. Over a one-year time horizon, you could easily reach a different valuation conclusion. For example, if you believe that real timber prices will decline over the next year, and/or that physical harvesting rates will increase to cover costs and dividends, then you could argue that, in so far as PCL and RYN are roughly accurate proxies for the asset

---

class as a whole, timber, as measured by PCL and RYN, is likely overpriced today. On the other hand, whether looking over a short or long-term time horizon, if you believe that future revenues from timber's CO<sub>2</sub> sequestration service are likely to be significant, and/or that four percent is too high a risk premium to use, then you could argue that timber is likely underpriced today.

In sum, timber valuation is an issue upon which reasonable people can and do disagree, in no small measure because of their different time horizons and the different underlying assumptions and methodologies they use to reach their conclusions. On balance, taking a long-term view, we continue to believe that timberland is likely underpriced today, for three reasons: (1) future revenue growth related to CO<sub>2</sub> sequestration is likely to be significant; (2) the negative impact on timber prices caused by the recession and long-term slowdown in North American housing construction will be moderated or offset by the impact of supply side changes, such as the mountain pine beetle problem, and by rising demand for wood products that will accompany rising incomes in China.

### Volatility

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 31, 2009, the average daily value of the VIX Index was 20.29 (median 18.77), with a standard deviation of 8.36 (skewness 2.05, kurtosis 7.28 – i.e., a very “non-normal” distribution). On **31 Dec 10**, the VIX closed at 17.75. To put this in perspective, 58% of the trading days in our sample had higher closing values of the VIX. In sum, at the end of last month, volatility was at a level that we believe is inconsistent with the high uncertainty regime that we expect to prevail in global financial markets over the next year. For these reasons we concluded that volatility is probably underpriced over a one year time horizon.

---

Over a longer-term time horizon, we are neutral at the current level of volatility. The logic behind this view is that structural changes – such as electronic trading, faster dispersal of information to investors, and the substantial amount of money committed to various quantitative trading strategies -- may well have made equity prices permanently more volatile than they have been in the past.

### **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, 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 (for three good papers on rotation strategies, see “Sector Rotation Over Business Cycles” by Stangl, Jacobsen and Visaltanachoti; “Can Exchange Traded Funds Be Used to Exploit Industry Momentum?” by Swinkels and Tjong-A-Tjoe; and “Mutual Fund Industry Selection and Persistence” by Busse and Tong).

That being said, the highest rolling three month returns in the table do provide us with 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 a plurality of investors (as measured by the value of the assets they manage) 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 (although some might argue that the growth of the credit derivatives market has undermined this discipline). As we

have written many times, investors seeking to achieve a funding goal over a multi-year time horizon, avoiding big downside losses is mathematically 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*

<i>Rolling 3 Month Returns Through</i>	<i>31Dec10</i>			
<b><i>Economy</i></b>	Bottoming	Strengthening	Peaking	Weakening
<b><i>Interest Rates</i></b>	Falling	Bottom	Rising	Peak
<b><i>Style and Size Rotation</i></b>	Small Growth (DSG) <b>17.68%</b>	Small Value (DSV) <b>12.39%</b>	Large Value (ELV) <b>8.04%</b>	Large Growth (ELG) <b>10.82%</b>
<b><i>Sector Rotation</i></b>	Cyclicals (RXI) <b>10.95%</b>	Industrials (EXI) <b>11.22%</b>	Staples (KXI) <b>5.03%</b>	Utilities (JXI) <b>1.45%</b>
<b><i>Bond Market Rotation</i></b>	Higher Risk (HYG) <b>3.29%</b>	Short Maturity (SHY) <b>-0.15%</b>	Low Risk (TIP) <b>-0.65%</b>	Long Maturity (TLT) <b>-9.50%</b>

## **Advisors' Corner: Talking to Clients Who Are (or Want to Be) Entrepreneurs**

What do you say to a client who is thinking about starting a business? Or to a client who has already become an entrepreneur? The answers to these questions are becoming more and more important, as developed nations confront two critical issues: inadequate job creation and slowing growth in total factor productivity. Recent

---

research by the Kauffman Foundation found that, “without startups [firms in existence for less than one year], there would have been no net job growth in the U.S. economy between 1977 and 2005” (“The Importance of Startups in Job Creation and Job Destruction:” by Tim Kane). Another recent Kauffman study found that, “fast-growing young firms, comprising less than 1 percent of all companies, generate roughly 10 percent of new jobs in any given year” (“High Growth Firms and the Future of the American Economy” by Dane Stangler). However, as a recent Wall Street Journal article noted, “in the early months of the economic recovery, start-ups of job-creating companies have failed to keep pace with closings, and even those concerns that do get launched are hiring less than in the past” (“Few Businesses Sprout, With Even Fewer Jobs” by Lahart and Whitehouse, *The Wall Street Journal*, 10Nov2010).

While employment growth is critical to short-term social and political stability, over the medium and long-term increasing living standards in developed nations depends on increasing the rate of total factor productivity growth. To briefly summarize economic theory, over the long-term, there should be a strong relationship between changes in real income and changes in labor productivity (though in the short-term, this relationship can be noisy, as evidenced by fluctuations over time in the ratio of corporate profits to Gross Domestic Product). Broadly speaking, there are two ways to increase labor productivity – by increasing the amount of capital per worker (e.g., giving a toolmaker a computer controlled lathe, rather than a metal file), and by increasing the amount of output produced from a given amount of input (labor hours and purchased materials), holding the amount of capital per worker constant. The former approach is known as “increasing capital intensity” while the latter is known as “increasing total factor productivity”, or TFP. While in the short-term, increasing capital/worker can deliver great productivity improvements (as we have recently seen in China), over longer periods increasing the amount of capital/worker is subject to diminishing marginal benefits (again as we are seeing in China), and it is rising TFP that must carry the day. This raises the question, what drives TFP growth? The answer is far from simple, and includes a wide range of causal factors, including improvements to the educational system, changes in organization (e.g., to obtain the

---

full benefits of information and communication technologies), funding and processes governing basic and applied research, changes in political institutions (e.g., laws governing contracts and the protection of intellectual property, business taxes and regulations, the extent of corruption, etc.), and the availability of financing for riskier investments. Researchers have also found that the extent of entrepreneurial activity in an economy has a strong impact on TFP (see, for example, “Total Factor Productivity and the Role of Entrepreneurship” by Erken, Donselaar, and Thurik, and “Do Economic Freedom and Entrepreneurship Impact Total Factor Productivity?” by Bjornskov and Foss). The OECD has estimated that, in eight industrialized countries, up to 40 percent of TFP growth may be due to entrepreneurship (“Understanding Economic Growth” OECD, 2005).

In sum, the entrepreneurs advised by financial advisers play a critical role in our economic future. Of course, that raises the further question of what the research says about who is likely to become an entrepreneur, and who is likely to achieve financial success in this area. At the macro level, the evidence suggests that while individual unemployment and underemployment tends to encourage people to think about starting a business, higher aggregate levels of unemployment tend to slow new business creation, presumably because of higher perceived uncertainty and risk (see “Entrepreneurship: Origins and Returns” by Berglann, Moen, Roed, and Skogstrom). At the micro level, there is evidence that entrepreneurship generates higher financial returns in some areas than others. Researchers have found that entrepreneurs are more likely to succeed when their new ventures are based on existing knowledge gained through extensive formal education and experience (“Where Does Entrepreneurship Pay?” by Braguinsky and Oyama). Other researchers have found that the level of entrepreneurial income is closely related to both general ability (as entrepreneurs are frequently called on to be “Jacks of All Trades”), and specific mathematical, technical and social abilities (“If You Are So Smart, Why Aren’t You an Entrepreneur?” by Hartog, van Praag, and van der Sluis). Nocolaou, Shane, Cherkas and Spector present interesting evidence that there is an important genetic component to entrepreneurship that manifests itself through the development of personality.

---

Specifically, they find that “between 37 and 42 percent of the variance in the tendency of people to engage in entrepreneurship is accounted for by genetic factors”, with a substantial part of this manifested in differences in people’s “sensation seeking”, which is defined as “the need for varied, novel, and complex sensations and experiences and the willingness to take risks for the sake of such experience.” Finally, in “Lean and Hungry, or Fat and Content?”, Hvide and Moen report that while the propensity to engage in entrepreneurship is constrained by the availability of financial resources (of which some, such as borrowing on credit cards and against home values, have recently experienced severe contractions), diminishing marginal returns are involved. Specifically, they conclude that “the relationship between prior wealth and start-up performance, as measured by return on assets, increases with the first three quartiles of prior wealth. However, in the top prior wealth quartile, profitability drops sharply, perhaps because higher wealth induces a less alert or less dedicated management.”

So far, so good. Thus far we have established that entrepreneurship is critical at the macroeconomic level, and identified some criteria that can be used to predict the future financial success of an entrepreneurial venture. So what can an advisor say to clients who are already entrepreneurs, or are thinking about becoming one? Let’s start with the obvious: an advisor is unlikely to have deep knowledge of an entrepreneur’s industry. But that doesn’t mean that an advisor cannot add value to an entrepreneur’s business, by helping him or her think systematically about it. In particular, experience has taught us that in most businesses, success and failure are not two sides of the same coin; rather, they are wholly different concepts. Avoiding failure means staying out of the left tail of the distribution of company performance, where the probability of not surviving as an independent entity is highest. More than anything else, the key to staying out of the left tail is getting the basics right, which, judging by the very high mortality rates for young companies, most entrepreneurs fail to do. Put differently, getting the basics right should ensure that a company lands in the middle of the performance distribution, earning approximately a rate of return commensurate with its risk, but not creating substantial value for its investors and employees. Achieving this result, and getting into the right tail of the performance

---

distribution, is based on an entirely different set of factors, which we will describe below.

So let's move on to the scene in an advisor's office, where he or she is meeting with a client who wants to become or already is an entrepreneur. Let's further assume that our advisor and client have already discussed the research on who is most likely to succeed as an entrepreneur. What's the next topic for discussion? As noted above, an advisor is unlikely to have an in-depth understanding of a particular industry. But what they can do is "pressure test" a potential entrepreneur's plans, to see how well they hold together, and highlight those areas where more work seems to be needed. Here are some ways an advisor could approach this.

#### Talk About the Different Types of Entrepreneurial Opportunity

- There is a world of difference between entering an existing market and creating a new market.
- The former lends itself to an analytical, predictive, planning-based approach. For example, the market can be broadly segmented into customers, non-users, and users of substitute product or service offerings. Each of these broad segments can be further analyzed on the basis of the way they rank different needs and desires, as well as by their purchasing power. For example, at a high level, customer segments can be defined by their ranking of the functionality they seek (what do they want the product or service to do?), the performance they seek (how well do they want it to perform different functions?), the form factor they seek, and the convenience they seek, all relative to the price they are willing or able to pay. The assumption here is that, provided they know about it, customers will choose the superior value proposition, which is defined as the benefit of a given package of functionality, performance, form and convenience that is available for a given price.
- In contrast, taking an analytical, predictive approach to the creation of a new market (e.g., a product or service that enables customers to do something they

---

could never do before), or any opportunity in which uncertainty is high, is too often a recipe for failure. Rather than gaining control of these situations by superior forecasting (which, as all advisors know, is extremely difficult), entrepreneurs pursuing so-called “disruptive innovations” attempt to gain control (and limit risk) through an approach that is variously known as “sense and respond”, “iterate and learn”, “lean start-ups”, or “effectual strategy” (for example, see “Effectual versus Predictive Logics in Entrepreneurial Decision Making: Differences Between Experts and Novices” and “What To Do Next? The Case for Non-Predictive Strategy” by Dew, Read, Sarasvathy, and Witbank). In essence, this approach accepts that in the face of high uncertainty, prediction is impossible, and instead assumptions can only be validated through a process of trial, error, and rapid adaptation. Put differently, in these circumstances, there is no substitute for getting out in the market, interacting with real customers, and seeing what sells. A key point here is that researchers have found that more often than not, the best way to approach these markets is to be a fast follower, rather than the first mover (see, for example, “Pioneer Advantage: Marketing Logic or Marketing Legend?” by Golder and Tellis).

### Talk About the “4Ms”

- Macro: How big is the potential market the company plans to serve? How fast is it growing? How are key customer segments defined? What are the demand drivers in these segments? Who are the most important competitors? What segments do they target, and how well do their offerings perform? What drives pricing? What drives input costs? What are the most important technological and regulatory trends and uncertainties, and what are their implications for your business model?

- Micro: Which customer segments are you targeting? What is your value proposition to them? Who do you compete against? Why will target customers choose you over competitors? What makes your offering hard to copy?
- Model: How will you create value for your investors? Why will your return on capital be substantially higher than your cost of capital? Where in your economic model will you have a price or cost advantage over competitors (put differently, where do your model assumptions differ from industry averages)? Which of the assumptions in your model are most critical to the returns you expect to generate? Which of these are most uncertain? What is your plan for validating them? What will you do if they prove not to be accurate? What will enable your team and business model to rapidly adapt?
- Management: What business processes are critical to implementing your business model? How are they defined? Who is responsible for performing each step in these processes? Which decisions are critical? What skills and experience are critical to making these decisions? Who on your team will make these decisions? How do their skills and experience align with the requirements for making good decisions? How will you attract, motivate, and retain the talented people you need to implement your business model? Why should they join your company instead of \_\_\_\_\_? What are the most important metrics you will use to measure your company's performance?
- We like to use the following framework to think about metrics and performance measurement. First, strategy can be defined as (a) the ends/goals to be pursued (contingent on survival, which, though not often stated, is always the primary goal); (b) the scarce resources/means that are available to achieve them; and (c) the ways these resources will be employed to achieve the stated ends; and (d) the critical uncertainties you face, the assumptions about them that underlie your plan; and (e) how you will validate those critical assumptions. Given this definition of strategy, there are, fundamentally, three types of metrics you can use to measure your performance: (1) Effectiveness, or results versus goals; (2) Efficiency, or resources expended to achieve those results; and (3)

---

Adaptability, or the extent to which Effectiveness and Efficiency metrics change when the environment changes – for example, for different outcomes for your critical assumptions. Another take on metrics is that the likelihood of failure increases by the amount by which the performance metrics used by an organization differ from the selection metrics used in the external environment to decide which firms survive.

### Conduct Two Pre-Mortems

- Tell your client to assume it is a year from now, and his or her business model has failed. Have them write you a story about why it happened, and what could have been done differently to avoid it. More often than not, this story will help to highlight the importance of avoiding failure by getting basic business processes right, early testing of critical assumptions, and quick adaptation if they prove to be wrong.
- Tell your client it is a year from now, and his or her initial business model has failed – yet the company has become a great success. Have them write another story about how this happened. This story helps to highlight some important keys to success in highly uncertain environments, including accepting that your initial business model will prove to be wrong, the need for proactive learning and adaptation (and learning from real customers and product offerings in particular), the importance of facilitating fast adaptation by buying low cost options that have high payoffs under different future scenarios, and the recognition that an organization's decision process is critical, and must involve a balance between intuitive and analytical approaches (in fact, those situations in which the two are in conflict and must be reconciled are great learning opportunities for a team).

### Keep Your Client Focused

- More often than not, your entrepreneur clients will arrive in your office feeling overwhelmed by the number of issues on their plate. You can quickly add value

---

(and help them gain a sense of control) by asking them to write down (a) their three biggest worries, and then (b) their current priorities, including 3 “To Do” items they must complete by the end of the week/month/quarter, 3 items they should complete, and four items they would like to complete. Then discuss how their priorities align with resolution of their top three worries. This never fails to be a productive conversation.

- A second aspect of keeping your client focused is to maintain a record of his or her answers to the questions noted above, and keep referring back to them in subsequent meetings – in effect, helping your client to continually re-validate or adapt the key assumptions that underlie his or her business model, to help them avoid the tendency toward denial that too often sinks start-ups (for an excellent client gift, see [Denial: Why Business Leaders Fail to Look Facts in the Face – And What to Do About It](#) by Richard Tedlow).

In sum, entrepreneurship is more critical today than ever before, and there are many steps that financial advisors can take to foster it, and in the process build stronger relationships with their entrepreneur clients.

## **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 uncorrelated alpha strategy 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 2010, our USD cash benchmark is 0.44% (in nominal terms). The second benchmark we use is a portfolio equally allocated between the ten asset classes we use (it does not include uncorrelated alpha). 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 at:  
<http://www.indexinvestor.com/Members/YTDReturns/USA.php>