# The Index Investor

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

## Contents



## March 2010 Issue: Key Points

"Having the bubble" is a phrase that is typically used among pilots and air traffic controllers to connote a high degree of "situational awareness", which is defined as an understanding of the key elements in a situation, their interrelationships, and the way the situation could evolve over time. To "have the bubble" requires the formation of a mental model of complex system, and the constant updating of that model as the underlying system and situations it creates constantly evolve. It is possible to "lose the bubble", whether due to disruptions to the updating process, or to surprising system behavior that causes you to lose confidence in your mental model. Whether you are responsible for managing many airplanes in a confined space, flying an airplane in combat, performing a complex operation, or managing a large amount of money, "losing the bubble" can be very dangerous, if not catastrophic. Here at *The Index*



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*Investor* and *Retired Investor*, we constantly worry about whether we still have the bubble, as the world economic and political system enters a period of heightened uncertainty. Quite honestly, over the past month or so, we have read an increasing number of articles by commentators we highly respect that indicate that a number of our long-held views are moving into the mainstream. And that nags at us. If the past thirty years have taught us anything, it is that when your views are the conventional wisdom, it is time to step back and take a good hard look for what you might be missing – because more often than not, the conventional wisdom turns out to be wrong.

With that in mind, we have been trying to break down the rising uncertainty we (and we're sure you too) feel into the key factors that are driving the evolution of our situation. We've used a framework we have profitably employed over the years to help us evaluate investments in different companies, which includes an examination of the key macro elements in the story, the micro elements, the plan that ties them together to create value, and our confidence in the management team that will execute, and inevitably have to adapt the plan. On balance, we conclude that the conventional wisdom is still missing some very important elements that could have very substantial effects on asset class returns in the years ahead.

In this month's product and strategy notes we highlight new research into how skilled managers allocate their attention differently during recessions and expansions, new products, and how advances in quantitative trading have exponentially complicated the already nearly impossible task of identifying skilled active managers in advance. Finally, in this month's Advisers' Corner, we summarize new research into the age old question, "what makes clients tick?", as well as new findings on what drives word of mouth referals.

## Global Asset Class Returns

| ***YTD 26Feb10*** | **In USD** | **In AUD** | **In CAD** | **In EUR** | **In JPY** | **In GBP** | **In CHF** | **In INR** |
|---|---|---|---|---|---|---|---|---|
| Asset Held | | | | | | | | |
| **USD Bonds** | 2.11% | 2.54% | 2.92% | 7.00% | -2.65% | 7.84% | 5.75% | 1.18% |



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| *YTD 26Feb10* | In USD | In AUD | In CAD | In EUR | In JPY | In GBP | In CHF | In INR |
|---|---|---|---|---|---|---|---|---|
| **USD Prop.** | -0.07% | 0.36% | 0.74% | 4.82% | -4.83% | 5.66% | 3.57% | -1.01% |
| **USD Equity** | -0.26% | 0.17% | 0.55% | 4.63% | -5.02% | 5.47% | 3.38% | -1.20% |
| | | | | | | | | |
| **AUD Bonds** | 1.86% | 2.30% | 2.67% | 6.75% | -2.89% | 7.59% | 5.50% | 0.93% |
| **AUD Prop.** | -1.28% | -0.85% | -0.47% | 3.60% | -6.04% | 4.45% | 2.36% | -2.22% |
| **AUD Equity** | -4.71% | -4.28% | -3.90% | 0.18% | -9.47% | 1.02% | -1.07% | -5.65% |
| | | | | | | | | |
| **CAD Bonds** | 0.82% | 1.25% | 1.63% | 5.71% | -3.94% | 6.55% | 4.46% | -0.11% |
| **CAD Prop.** | 2.64% | 3.07% | 3.45% | 7.53% | -2.12% | 8.37% | 6.28% | 1.71% |
| **CAD Equity** | -1.19% | -0.75% | -0.38% | 3.70% | -5.94% | 4.54% | 2.45% | -2.12% |
| | | | | | | | | |
| **CHF Bonds** | -2.46% | -2.02% | -1.65% | 2.43% | -7.21% | 3.27% | 1.18% | -3.39% |
| **CHF Prop.** | 2.02% | 2.45% | 2.83% | 6.91% | -2.74% | 7.75% | 5.66% | 1.09% |
| **CHF Equity** | -1.66% | -1.23% | -0.85% | 3.22% | -6.42% | 4.07% | 1.98% | -2.60% |
| | | | | | | | | |
| **INR Bonds** | -1.07% | -0.64% | -0.26% | 3.82% | -5.83% | 4.66% | 2.57% | -2.01% |
| **INR Equity** | -6.00% | -5.56% | -5.19% | -1.11% | -10.75% | -0.27% | -2.36% | -6.93% |
| | | | | | | | | |
| **EUR Bonds** | -1.94% | -1.50% | -1.13% | 2.95% | -6.69% | 3.79% | 1.70% | -2.87% |
| **EUR Prop.** | -3.39% | -2.95% | -2.58% | 1.50% | -8.14% | 2.34% | 0.25% | -4.32% |
| **EUR Equity** | -10.70% | -10.27% | -9.89% | -5.82% | -15.46% | -4.97% | -7.06% | -11.64% |
| | | | | | | | | |
| **JPY Bonds** | 4.56% | 4.99% | 5.37% | 9.45% | -0.20% | 10.29% | 8.20% | 3.62% |
| **JPY Prop.** | 8.16% | 8.59% | 8.96% | 13.04% | 3.40% | 13.88% | 11.79% | 7.22% |
| **JPY Equity** | 2.05% | 2.49% | 2.86% | 6.94% | -2.70% | 7.78% | 5.69% | 1.12% |
| | | | | | | | | |
| **GBP Bonds** | -5.43% | -5.00% | -4.63% | -0.55% | -10.19% | 0.29% | -1.80% | -6.37% |
| **GBP Prop.** | -11.30% | -10.87% | -10.49% | -6.42% | -16.06% | -5.57% | -7.66% | -12.24% |
| **GBP Equity** | -6.19% | -5.76% | -5.39% | -1.31% | -10.95% | -0.47% | -2.55% | -7.13% |
| | | | | | | | | |
| **1-3 Yr USGvt** | 0.96% | 1.39% | 1.76% | 5.84% | -3.80% | 6.69% | 4.60% | 0.02% |
| **World Bonds** | -0.01% | 0.42% | 0.80% | 4.87% | -4.77% | 5.72% | 3.63% | -0.95% |
| **World Prop.** | -2.27% | -1.84% | -1.46% | 2.61% | -7.03% | 3.46% | 1.37% | -3.21% |
| **World Equity** | -3.13% | -2.70% | -2.33% | 1.75% | -7.89% | 2.59% | 0.51% | -4.07% |
| **Commod Long Futures** | -4.26% | -3.83% | -3.45% | 0.63% | -9.02% | 1.47% | -0.62% | -5.19% |
| **Commod L/Shrt** | -10.49% | -10.05% | -9.68% | -5.60% | -15.24% | -4.76% | -6.85% | -11.42% |
| **Gold** | 1.98% | 2.41% | 2.78% | 6.86% | -2.78% | 7.70% | 5.61% | 1.04% |
| **Timber** | -3.40% | -2.97% | -2.60% | 1.48% | -8.16% | 2.32% | 0.23% | -4.34% |
| **Uncorrel Alpha** | 0.58% | 1.02% | 1.39% | 5.47% | -4.17% | 6.31% | 4.22% | -0.35% |
| **Volatility VIX** | 0.15% | 0.59% | 0.96% | 5.04% | -4.60% | 5.88% | 3.79% | -0.78% |
| ***Currency*** | | | | | | | | |
| **AUD** | -0.43% | 0.00% | 0.37% | 4.45% | -5.19% | 5.29% | 3.21% | -1.37% |
| **CAD** | -0.81% | -0.37% | 0.00% | 4.08% | -5.56% | 4.92% | 2.83% | -1.74% |
| **EUR** | -4.89% | -4.45% | -4.08% | 0.00% | -9.64% | 0.84% | -1.25% | -5.82% |
| **JPY** | 4.76% | 5.19% | 5.56% | 9.64% | 0.00% | 10.48% | 8.40% | 3.82% |



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| *YTD 26Feb10* | In USD | In AUD | In CAD | In EUR | In JPY | In GBP | In CHF | In INR |
|---|---|---|---|---|---|---|---|---|
| **GBP** | -5.73% | -5.29% | -4.92% | -0.84% | -10.48% | 0.00% | -2.09% | -6.66% |
| **USD** | 0.00% | 0.43% | 0.81% | 4.89% | -4.76% | 5.73% | 3.64% | -0.94% |
| **CHF** | -3.64% | -3.21% | -2.83% | 1.25% | -8.40% | 2.09% | 0.00% | -4.57% |
| **INR** | 0.94% | 1.37% | 1.74% | 5.82% | -3.82% | 6.66% | 4.57% | 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):

| *YTD 26Feb10* | In USD | In AUD | In CAD | In EUR | In JPY | In GBP | In CHF | In INR |
|---|---|---|---|---|---|---|---|---|
| ***Eq Mkt Neutral*** | | | | | | | | |
| HSKAX | 1.15% | 1.59% | 1.96% | 6.04% | -3.61% | 6.88% | 4.79% | 0.22% |
| OGNAX | -0.10% | 0.33% | 0.71% | 4.79% | -4.86% | 5.63% | 3.54% | -1.03% |
| ***Arbitrage*** | | | | | | | | |
| ARBFX | 1.10% | 1.54% | 1.91% | 5.99% | -3.65% | 6.83% | 4.74% | 0.17% |
| ADANX | -0.09% | 0.34% | 0.71% | 4.79% | -4.85% | 5.64% | 3.55% | -1.03% |
| ***Currency*** | | | | | | | | |
| DBV | -2.25% | -1.82% | -1.44% | 2.63% | -7.01% | 3.48% | 1.39% | -3.19% |



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| *YTD 26Feb10* | In USD | In AUD | In CAD | In EUR | In JPY | In GBP | In CHF | In INR |
|---|---|---|---|---|---|---|---|---|
| ICI | 2.04% | 2.47% | 2.85% | 6.93% | -2.72% | 7.77% | 5.68% | 1.11% |
| ***Equity L/S*** | | | | | | | | |
| HSGFX | 0.23% | 0.67% | 1.04% | 5.12% | -4.52% | 5.96% | 3.87% | -0.70% |
| PTFAX | 3.82% | 4.25% | 4.63% | 8.71% | -0.94% | 9.55% | 7.46% | 2.88% |
| ***GTAA*** | | | | | | | | |
| MDLOX | -1.40% | -0.96% | -0.59% | 3.49% | -6.15% | 4.33% | 2.24% | -2.33% |
| PASAX | 1.31% | 1.75% | 2.12% | 6.20% | -3.44% | 7.04% | 4.95% | 0.38% |

## 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



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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



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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



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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



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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 believed was the most likely to develop.

For the time series perspective, we vertically compare this month's average rolling three month return for a given regime to the regime's rolling three month average 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.

| *Rolling Three Month Returns in USD* | | 26Feb10 |
|---|---|---|
| ***High Uncertainty*** | ***High Inflation*** | ***Normal Growth*** |
| Short Maturity US Govt Bonds (SHY) **0.11%** | US Real Return Bonds (TIP) **-1.88%** | US Equity (VTI) **2.61%** |
| 1 - 3 Year International Treasury Bonds (ISHG) **-6.41%** | Long Commodities (DJP) **-2.11%** | EAFE Equity (EFA) **-4.11%** |
| Equity Volatility (VIX) **-19.98%** | Global Commercial Property (RWO) **1.46%** | Emerging Equity (EEM) **-3.02%** |
| Gold (GLD) **-5.37%** | Long Maturity Nominal Treasury Bonds (TLT)* **-4.15%** | High Yield Bonds (HYG) **3.65%** |
| ***Average*** ***-7.91%*** ***Three Months Ago:*** ***5.78%*** | ***Average (with TLT short)*** ***0.41%*** ***Three Months Ago:*** ***5.15%*** | ***Average*** ***-0.22%*** ***Three Months Ago:*** ***8.49%*** |

* Falling returns on TLT indicate rising inflation expectations

As you can see, at the end of last month, the conventional wisdom appeared to marginally favor a return to the high inflation regime. It also appeared that investors (in aggregate) reduced the probability they attached to a return to the high uncertainty



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regime. As noted elsewhere in this issue, our view of the future is exactly the opposite.

At the request of many readers, we will now publish forecasts for real returns on different asset classes. 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



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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., averaging) forecasts produced using different methodologies. With that admonition, our results are as follows:

| **Regime** | **Normal Regime** | **High Uncertainty Regime** | **High Inflation Regime** | ***Forecast Annualized USD Real Return*** |
|---|---|---|---|---|
| *Assumed Regime Probability Over Next 36 Months* | *20%* | *50%* | *30%* | |
| *Real Rate Under Regime* | *3.50%* | *2.50%* | *1.50%* | ***2.40%*** |
| **Asset Class Premia** | | | | |
| Domestic Bonds | 1.0% | 1.0% | -3.0% | ***2.20%*** |
| Foreign Bonds | 0.5% | 2.0% | 0.5% | ***3.65%*** |
| Domestic Property | 3.0% | -10.0% | 1.0% | ***-1.70%*** |
| Foreign Property | 3.0% | -10.0% | -1.5% | ***-2.45%*** |
| Commodities | 2.0% | -6.0% | 3.0% | ***0.70%*** |
| Timber | 2.0% | -8.0% | 1.0% | ***-0.90%*** |
| Domestic Equity | 3.5% | -12.0% | -5.0% | ***-4.40%*** |
| Foreign Equity | 3.5% | -12.0% | -7.0% | ***-5.00%*** |
| Emerging Equity | 4.5% | -15.0% | 1.0% | ***-3.90%*** |
| Gold | -2.0% | 2.0% | 2.5% | ***3.75%*** |



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| Regime | Normal Regime | High Uncertainty Regime | High Inflation Regime | *Forecast Annualized USD Real Return* |
|---|---|---|---|---|
| Volatility | -25.0% | 50.0% | 25.0% | ***29.90%*** |

## 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 **26 Feb 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.



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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



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they should move under interest rate parity indicates a rising risk of sudden reversal (il.e., crash risk).

The table also shows return momentum for different asset classes over the preceeding three months, as well as the previous three month period, 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.

| ***Valuation at 26Feb10*** | ***Current Price versus Long-Term Fundamental Valuation Estimate*** | ***Return Momentum (Most Dangerous Conditions are Positive Accelerating Momentum and Fundamental Overvaluation)*** | ***Rolling 3 Month Return in Local Currency*** | ***Rolling 3 Month Return 3 Months Ago*** |
|---|---|---|---|---|
| | | | | |
| **AUD Real Bonds** | Neutral | Positive, Slowing | 0.80% | 5.51% |
| **AUD Bonds** | Neutral | Negative Reversal | -2.07% | 2.11% |
| **AUD Property** | Neutral | Positive Reversal | 1.10% | -0.94% |
| **AUD Equity** | Neutral | Negative Reversal | -0.78% | 5.10% |
| | | | | |
| **CAD Real Bonds** | Neutral | Positive, Slowing | 1.33% | 3.86% |
| **CAD Bonds** | Possibly Overvalued | Negative Reversal | -0.02% | 2.01% |
| **CAD Property** | Likely Undervalued | Positive, Accelerating | 11.76% | 8.53% |



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| *Valuation at 26Feb10* | *Current Price versus Long-Term Fundamental Valuation Estimate* | *Return Momentum (Most Dangerous Conditions are Positive Accelerating Momentum and Fundamental Overvaluation)* | *Rolling 3 Month Return in Local Currency* | *Rolling 3 Month Return 3 Months Ago* |
|---|---|---|---|---|
| **CAD Equity** | Possibly Overvalued | Positive, Slowing | 1.79% | 6.33% |
| | | | | |
| **CHF Bonds** | Likely Overvalued | Negative Reversal | -0.59% | 1.78% |
| **CHF Property** | Possibly Overvalued | Positive, Accelerating | 7.28% | 0.97% |
| **CHF Equity** | Probably Overvalued | Positive Reversal | 5.68% | -0.02% |
| | | | | |
| **EUR Real Bonds** | Neutral | Negative Reversal | -1.05% | 1.82% |
| **EUR Bonds** | Possibly Overvalued | Positive, Slowing | 0.49% | 0.78% |
| **EUR Prop.** | Neutral | Positive, Slowing | 4.41% | 5.30% |
| **EUR Equity** | Likely Undervalued | Negative Reversal | -2.72% | 11.73% |
| | | | | |
| **GBP Real Bonds** | Possibly Overvalued | Negative Reversal | -2.52% | 4.20% |
| **GBP Bonds** | Neutral | Negative Reversal | -2.28% | 0.70% |
| **GBP Property** | Possibly Undervalued | Negative, Slowing | -1.46% | -1.51% |
| **GBP Equity** | Likely Undervalued | Positive, Accelerating | 7.47% | 5.70% |
| | | | | |
| **INR Bonds** | Likely Overvalued | Negative, Slowing | -1.60% | -2.44% |
| **INR Equity** | Probably Overvalued | Negative Reversal | -3.97% | 8.04% |
| | | | | |
| **JPY Real Bonds** | Neutral | Positive, Slowing | 1.44% | 3.29% |
| **JPY Bonds** | Possibly Overvalued | Negative Reversal | -0.49% | 0.40% |
| **JPY Property** | Likely Undervalued | Positive Reversal | 11.30% | -15.59% |
| **JPY Equity** | Probably Overvalued | Positive Reversal | 8.19% | -13.15% |
| | | | | |
| **USD Real Bonds** | Neutral | Negative Reversal | -1.92% | 6.18% |
| **USD Bonds** | Possibly Overvalued | Negative, Slowing | -0.39% | -3.65% |
| **USD Property** | Neutral | Positive, Slowing | 6.96% | 8.70% |
| **USD Equity** | Probably Overvalued | Positive, Slowing | 2.59% | 7.22% |
| ***Following in USD:*** | | | | |
| **Investment Grade Credit (CIU)** | Possibly Overvalued | Positive, Slowing | 0.83% | 2.88% |
| **High Yield Credit (HYG)** | Probably Overvalued | Positive, Slowing | 3.37% | 6.52% |
| **Emerging Mkt Equity (EEM)** | Probably Overvalued | Positive, Slowing | 9.07% | 14.03% |
| **Commodities Long** | Likely Overvalued | Negative Reversal | -2.11% | 9.22% |



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| ***Valuation at 26Feb10*** | ***Current Price versus Long-Term Fundamental Valuation Estimate*** | ***Return Momentum (Most Dangerous Conditions are Positive Accelerating Momentum and Fundamental Overvaluation)*** | ***Rolling 3 Month Return in Local Currency*** | ***Rolling 3 Month Return 3 Months Ago*** |
|---|---|---|---|---|
| **Gold** | Likely Undervalued | Negative Reversal | -5.37% | 23.81% |
| **Timber** | Possibly Undervalued | Positive, Accelerating | 5.48% | 5.08% |
| **Uncorrelated Alpha** | N/A | Positive, Slowing | 1.04% | 1.78% |
| **Volatility (VIX)** | Probably Undervalued | Negative, Accelerating | -19.98% | -6.31% |
| ***Future Return in Local Currency from holding USD:*** | ***Based on Covered Interest Parity*** | | | |
| **Returns to AUD Investor** | Positive | Positive Reversal | 3.77% | -13.11% |
| **Returns to CAD Investor** | Neutral | Positive Reversal | 0.01% | -5.36% |
| **Returns to EUR Investor** | Neutral | Positive Reversal | 10.35% | -4.93% |
| **Returns to JPY Investor** | Negative | Positive Reversal | 3.13% | -7.34% |
| **Returns to GBP Investor** | Neutral | Positive Reversal | 7.97% | -0.91% |
| **Returns to CHF Investor** | Negative | Positive Reversal | 6.97% | -7.01% |
| **Returns to INR Investor** | Positive | Negative, Slowing | -0.89% | -4.94% |

## 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 Thurner, 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



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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 are switching 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:

| Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec09 | Jan10 | Feb10 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.41 | 0.35 | 0.33 | 0.33 | 0.51 | 0.51 | 0.56 | (0.30) | 0.72 | 0.24 | (0.03) | 0.30 |



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As you can see, in recent months global financial markets appear to have gone from a highly ordered and fragile state in November to one that was highly disordered by the end of January, and therefore at lower risk of a sudden, substantial, and highly correlated change in prices across multiple asset classes. In February, global financial markets became more ordered, but not to the extent of the high degree seen last summer.

## This Month's Letters to the Editor

*My approach to asset allocation, formed in the days before Greenspan, et. al. was that buying a growing income was the predominant driver of equity investment management, that insurance against the unknown was provided by cash and government bonds, and that to keep the client's money safe over the years was all that could be expected of investment management. What changed, and made investors so mad for alpha?*

Thank you for an excellent question that highlights some timeless points. As you note, and we have once again highlighted in this month's Product and Strategy notes, the basic "investment return" on equities comes from a combination of the dividend yield and the rate of dividend or earnings growth (which are equal, assuming a constant dividend payout ratio). The so-called "speculative return" comes from the changes in the price/earnings ratio – how much an investor will pay for $1 in earnings or dividends, regardless of how fast they are growing. Whereas the investment return is driven by the fundamental competitiveness of the business, the speculative return reflects changing investor emotions. So we completely agree with you on what constitutes a sound approach to investing in equities. Where we might disagree a bit is with regard to what you term "insurance against the unknown." In the past, when far fewer investable asset classes were available, cash and government bonds were pretty much your only choices. Today there are more, including real return bonds, liquid commercial property securities, timber, commodities and volatility. In essence,



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these offer the opportunity to more efficiently and effectively obtain insurance against different types of unknowns – say high inflation or high uncertainty. But the general principle remains the same. We also completely agree with you about the importance of preserving capital. We have repeatedly noted that when it comes to achieving long-term financial objectives, avoiding substantial losses is far more important than taking on extra risk to obtain that last bit of return. Which brings us to the most interesting part of your question – what has made so many investors depart from the sensible principles you described, and engage in a mad hunt for alpha?

I think there were a number of factors that led to the phenomenon you describe. Perhaps the most important was the passage of the Employee Retirement Income Security Act of 1974 (ERISA) in the United States. This not only established standards for fiduciary duty and the management of pension funds, but also created recourse to the courts for plaintiffs who thought investment managers were falling short of those standards. In turn, this created demand for consultants who could help pension fiduciaries measure and evaluate investment manager performance, and particularly to help insure that pension fiduciaries were exercising due care when they spent plan participants' money to hire active managers. Finally, the parallel developments of academic finance theory, electronic exchanges, and information and communication technology more generally led to more and more quantitative approaches to investment manager performance evaluation, which further fed the preoccupation with alpha. As we noted last month in our article about the Norway sovereign wealth fund's review of active versus passive investment management, at this point ever more sophisticated approaches to assessing manager performance have created a thicket of terms (active return, alpha, IR, exotic beta, alternative beta, etc.) that cumulatively create far more confusion than clarity about the essential question of whether or not an active manager is truly skilled. And we have no doubt that more than one consulting firm has leveraged pension fiduciaries' concerns with ERISA compliance to sell yet another complicated manager selection and performance evaluation project. Yet for all that effort, as Norway has discovered, the contribution of active management to the returns on its sovereign wealth fund pale in



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comparison to the impact of asset allocation and rebalancing, and the returns over time on the broad asset classes in which the fund invests. So if the underlying point of your question is that for the past 30 plus years the investment management industry has been putting the cart before the horse, we wholeheartedly agree.

*Can you describe the "black box" at the heart of your approach to asset allocation?*

I'm afraid we don't really have one. We try to be clear about the logic that we use to derive our asset class return, risk and correlation assumptions under the different regimes we incorporate in our models. We are also quite clear about the goals we set, and the constraints we impose on our search for robust solutions to the asset allocation problems we pose. To the extent that a "black box" exists, it lies in the software we use to intelligently search for, test and compare robust solutions to our portfolio construction problem. Because of the way the problem is structured (e.g., with multiple goals and constraints, and a long time horizon), a brute force solution to a realistic portfolio construction problem usually aren't possible. Hence, you can never arrive at a truly optimal solution, in the sense that you are sure it is superior to all possible alternatives. At best, you can identify solutions that are robust, in that they have a high probability of achieving your goals within the constraints you specify under a wide range of future scenarios. To accomplish this, we use a software package called Crystal Ball, which combines stochastic search, simulation and optimization to identify robust solutions to complicated combinatorial problems within acceptable time constraints.

## March 2010 Economic Update: Do We Still "Have the Bubble"?

"Having the bubble" is a phrase that is typically used among pilots and air traffic controllers to connote a high degree of "situational awareness", which is defined as an understanding of the key elements in a situation, their interrelationships, and the way the situation could evolve over time. To "have the bubble" requires the formation of a mental model of complex system, and the constant updating of that model as the



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underlying system and situations it creates constantly evolve. It is possible to "lose the bubble", whether due to disruptions to the updating process, or to surprising system behavior that causes you to lose confidence in your mental model. Whether you are responsible for managing many airplanes in a confined space, flying an airplane in combat, performing a complex operation, or managing a large amount of money, "losing the bubble" can be very dangerous, if not catastrophic. Here at *The Index Investor* and *Retired Investor*, we constantly worry about whether we still have the bubble, as the world economic and political system enters a period of heightened uncertainty. Quite honestly, over the past month or so, we have read an increasing number of articles by commentators we highly respect that indicate that a number of our long-held views are moving into the mainstream. And that nags at us. If the past thirty years have taught us anything, it is that when your views are the conventional wisdom, it is time to step back and take a good hard look for what you might be missing – because more often than not, the conventional wisdom turns out to be wrong.

With that in mind, we have been trying to break down the rising uncertainty we (and we're sure you too) feel into the key factors that are driving the evolution of our situation. We've used a framework we have profitably employed over the years to help us evaluate investments in different companies, which includes an examination of the key macro elements in the story, the micro elements, the plan that ties them together to create value, and our confidence in the management team that will execute, and inevitably have to adapt the plan. What then, are the key macro elements in our situation? We believe there are five broad ones. The first are the slow moving yet powerful forces of demographic change, an in particular an unprecedented aging of rich societies around the world. Consider the following table, which shows the United Nation's estimates for the ratio of the number of people 65 and older to those between 15 and 64 (this is technically known as the "Old Age Dependency Ratio"):

| Country | OAD Ratio in 2010 | OAD Ratio in 2050 | 2050 Mid - 2010 |
|---|---|---|---|



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| | | *Low Est.* | *Med. Est.* | *High Est.* | |
|---|---|---|---|---|---|
| Australia | 21% | 36% | 40% | 44% | ***19%*** |
| Canada | 20% | 40% | 45% | 48% | ***25%*** |
| U.K. | 25% | 34% | 38% | 42% | ***13%*** |
| U.S.A. | 19% | 32% | 35% | 39% | ***16%*** |
| France | 26% | 43% | 47% | 53% | ***21%*** |
| Germany | 31% | 53% | 61% | 67% | ***30%*** |
| Italy | 31% | 56% | 64% | 70% | ***33%*** |
| Spain | 25% | 54% | 64% | 66% | ***39%*** |
| Switzerland | 26% | 40% | 46% | 50% | ***20%*** |
| Japan | 35% | 66% | 76% | 85% | ***41%*** |
| China | 11% | 34% | 38% | 43% | ***27%*** |
| India | 8% | 18% | 20% | 23% | ***12%*** |

This table hints at many stories that will unfold over the next decade, including (1) countries' need to cope with rising social security and health care needs (e.g., which paints Australia's mandatory superannuation savings plan and mixed health care plans in an extremely favorable light), (2) the need to focus even more carefully on the drivers of economic growth, including increased savings and investment, labor force growth (whether by raising retirement ages or becoming more attractive to highly productive immigrants), and, above all, higher total factor productivity (TFP) growth; (3) the extreme challenge facing continental Europe and Japan; (4) the surprising challenge that Canada appears to face; (5) the pressure that rapid ageing will exert on China (which implies a conflict between the world's short term need for higher consumption growth in China and the country's need to maintain high savings to cushion the impact of a rapid rise in the Old Age Dependency Ratio); (6) the relative demographic advantages of the UK, USA, and especially India; and (7) the political conflicts that are likely to ensue simply because the elderly have a greater tendency to vote than do the young.

The second macro factor that contributes to our heightened uncertainty today is the tension between the individual and collective that exists in many societies today. More specifically, in recent years we have observed three key social trends that, to varying degrees, seem to be underway around the world: (a) growth in what we call the libertarian/highly individualistic orientation; (b) a widening gap between the



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economic resources and social values of people in the top ten percent and bottom 90 percent of the household income distribution (with a simultaneous erosion of both the economic and the social values "middle class"); and (c) a rise in populist anger driven by a rising sense of vulnerability and a prolonged period of debt fueled conspicuous consumption (and in some countries, a rising mismatch between the ratio of young males to young females). We aren't sure where these trends will lead. However, we believe we are facing a very volatile social mix that could generate very unpredictable consequences. Historically, these elements have led to a turn to authoritarian governments, a tendency to blame problems on "the other", rising barriers to trade and capital flows, and in some cases to violent conflict.

The third macro factor is a growing questioning of the legitimacy of current political institutions around the world, particularly as they seem to flounder in the face of the challenges we now confront. Internationally, one form this has taken is rising sentiment against globalization. It also may soon lead to questions about the future of the Eurozone, the governing mandate of the Chinese Communist Party, the power of public sector unions throughout the West, the ability of governments to take difficult budgetary or regulatory actions, or the purpose of political parties dominated by extremists that seem to block the resolution of pressing national problems. In sum, more and more people seem to have a rising sense that many current institutions aren't working.

The fourth macro factor is economics, and specifically the interplay between the impact of debt (and the growing tension between controlled deleveraging and default), and the ability of societies to create jobs and raise worker productivity so as to generate rising real wages and household incomes. If we fail at creating jobs and raising productivity and wages, rising defaults can't be far behind. But what about inflation? I'm increasingly doubtful that it is possible for a large nation to reduce the value of its debts via inflation. Average maturities are no so short – on the order of four years, or so, for most countries – that a rapid rise in the returns demanded by bond market investors seems likely to kill this strategy before it gains much traction. Of course, as Zimbabwe and Argentina have shown that isn't the case for countries



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that have a low reliance on international bond markets, as domestic investors are easier to bully. But it is hard to see how that could work for large nations, absent a dramatic descent into a world of trading blocs that have little interaction with each other.

The fifth and final macro factor is technology, in at least three dimensions. The first is the rise in network connectedness that continues to accelerate around the world. As we have repeatedly noted, this not only overwhelms thinking with a flood of data, but also accelerates the global transmission of emotion. Neither of these suggests a less volatile future; rather they suggest ever growing pressure on our ability to "have the bubble." The second dimension is our increasing dependence on technology, and hence heightened vulnerability to asymmetric threats that range from techno-viruses to electromagnetic pulse. The third dimension is the accelerating capability of what (in the old days) was known as artificial intelligence, but which today encompasses a much wider range of sensor, processing, and decision making technologies. People who write about subjects like "the singularity" (the point at which a machine exceeds the intelligence of a human being) and the implications of rapidly accelerating technological change have always seemed a bit "out there" to me, and probably to many of our readers. But lately, "out there" is feeling more and more like "right here" – for example, see our comments about the sophistication of today's quantitative trading in this month's Product and Strategy Notes.

The way these macro trends manifest themselves, and the institutions that guide there interaction, will continue to be primarily defined by the nation state, which remains the only organizations whose use of force is generally viewed by outsiders as legitimate. And history has shown that the use of force will never go out of style. In very broad terms, there seem to be at least three archetypical micro models at work in the world today. One is AngloSaxon, which offers relatively high degrees of individual freedom, idealism, and aggregate wealth creation, but at the cost of higher uncertainty, social tension and vulnerability. Particularly in its Presidential form, it is under considerable strain today. The second model is grounded in Continental Europe, and offers less freedom, dynamism, and wealth creation, but also less uncertainty and



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social tension. For many people, it offers an attractive middle ground between the AngloSaxon and Authoritarian models. Perhaps the most powerful argument against this view is the inability of the Continental model to inspire people to have enough children to perpetuate their society. Another is that when it has been tried outside of Europe, say in Latin America, it has proven to be quite unstable – which suggests to me that a deeply rooted cultural identity is essential to its successful functioning. The final model is the one that has proven to be a powerful attractor throughout history – Authoritarian systems that limit conflict between rival groups, there by enabling them to produce and divide a greater amount of spoils. China is in this category today, as are Russia, much of Africa and virtually all of the Middle East, with the exceptions of Israel and, perhaps one day, Iraq. Arguably a number of countries in Asia and Latin America are teetering on the brink of the Authoritarian precipice, or, as in the case of Venezuela, have already gone over. As we have repeatedly noted over the years in response to our apparent lack of limitless enthusiasm for emerging market debt and equity, investors ignore the institutional context at their peril. Too many people in the West comfortably assume that democracy, and well functioning property and contract law, not to mention a relatively fair judicial system, are all part of the natural order of things, the type of government towards which other countries, with once they achieve a sufficient level of economic development, will inevitably evolve. I'm not so sanguine about that, and believe that history teaches us that the attractions of the authoritarian approach rise with a population's sense of uncertainty and vulnerability. If anything, it has been the emergence of stable democracies that has been the historical exception, rather than people's continuing attraction to authoritarian governments.

This brings us to the more practical question of which nation states, if any, appear to have a model (I'd say plan, but that is too deterministic) that will enable their institutions to manage the uncertainties and challenges caused by our key macro trends. For example, we know that in the United States, restoring growth will require the nation to address pressing federal fiscal problems like social security, Medicare and Medicaid, similarly pressing problems at the state and local level (primarily revolving around the future ability of government to efficiently and effectively deliver a



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package of services that voters seek at a price they are willing and able to pay), the need for a substantial increase in private and public sector investment, job creation, the headwinds caused by the debt overhanging the household sector and financial system, and a wide range of regulatory reforms (e.g., to the education system) that are needed to raise long term total factor productivity growth (for a more comprehensive article on this , see James Fallows "How America Can Rise Again" in the January issue of *The Atlantic*). But does anybody have much confidence in the model that exists today for tackling those challenges?

Contrast the United States with Australia or Canada, both of which have, in my experience, a better balance between the individual and the collective that has already enabled them to take major steps towards resolving, or at least controlling, the challenges posed by aging populations and more efficient and effective government. Not that they are without their problems – for example, Australia has yet to experience a downturn in an apparently overvalued housing market, while Canada continues to struggle with the need to raise TFP growth and reduce the rate of increase in household borrowing. And both are still quite dependent on commodities exports and Chinese demand for them. But those problems seem more tractable than those facing the United States or many nations in Continental Europe today – and maybe even China too. The point is, it is hard to point to many models that seem to be working today, which only raises the temptation to pursue authoritarian solutions of one type or another (see, for example, Walter Russell Mead's blog post "Do Soldiers Drink Tea?" on The-American-Interest.com).

Finally we come to management, or, more accurately, the quality of the leaders who will implement and adopt the model. I have read enough history to know that this is the ultimate wild card, a source of both uncertainty and hope. To cite but one example, over a decade spent working in Latin America I saw countries ruined due to the corrosion of public and private sector leadership by corruption and self-interest -- but I also saw the triumph of leadership in the form of Luiz Inacio Lula da Silva who had confounded his detractors (and they have been many over the years), risen above what his past had indicated, and led Brazil's amazing turnaround story, so that it is



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finally realizing its enormous potential. So while I can't say that I'm overly impressed with many leaders on the world stage today (in both the public and private sectors), neither am I without hope about the positive surprises that difficult and challenging times can produce.

What then, are the asset allocation implications of these observations? Obviously, given the ground I have just covered anything I write runs the risk of sounding too glib. Yet there are still some important takeaways. Obviously, everything we have written in the past about the likelihood of a return to the high uncertainty regime, and the asset classes that will do well under it still stands – particularly for volatility, which seems extraordinarily cheap today, given our outlook for the future. We also stand by our long held positive view of real return and short term government bonds issued by Australia and Canada, and our much more negative view of debt issued by many U.S. states and municipalities, to which we must now add the debt of the so-called Club Med countries (perhaps it is because I hold an Irish passport, but I have more confidence in that nation's ability navigate and benefit from a period of deep austerity than I do their neighbors to the south). In other segments of the fixed income market, I side with Bill Gross, and his view that real old fashioned credit analysis skills will be making a comeback in the years ahead. Fortunately, all of us here still remember the 5 Cs. Beyond that, with the passage of time, I become more and more confident that India's best days still lie ahead of it – a statement that I am much less willing to make about China, which faces much more serious challenges in the years ahead, some of which could very easily have very negative implications for the rest of us.

In an uncertain world, I can also see commercial property making a comeback, as investors come to appreciate of an asset they can kick, even if it is only half leased. As for equities, I remain convinced that valuations are for the most part too high today, but are likely at some point in the future to come down to levels that, for buyers who have the courage of their analytical convictions, will generate very attractive long term returns. But in most cases, we haven't reached that point yet. As for timber, even in a very uncertain world, it keeps growing, and cares not a whit what happens to other



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asset classes. Enough said. I also think that, given the enormous amounts of natural gas that have been discovered in the United States (and potentially in other countries too), increasing demand for this fuel in a world that will be more concerned with CO2 emissions (I don't think the underlying problem is going away any time soon), we should see growing interest in direct energy investments as a way to gain exposure to commodities.

Last but certainly not least, the three critical indicators we will very carefully watch over the next two years are job creation, levels of public and private investment spending, and changes in total factor productivity growth in the countries and regions we track. If all these recover, I believe that the negative effects of gradual deleveraging will remain within acceptable bounds. However, if this isn't the case, then I think we will see a surge in bankruptcy filings, strategic mortgage defaults, debt/equity conversions and quite possibly the Northern Rock style nationalization of many banks. On the positive side, my experience in Latin America, not to mention a reading of economic history, tells me that a short sharp extinguishing of substantial amounts of debt can result in a very strong recovery, which will particularly benefit countries that aren't also looking at a rapid increase in their old age dependency ratio. On the negative side, this can be a very painful time for creditors (e.g., holders of paper backed by residential mortgages) and shareholders who are radically diluted by forced debt/equity conversions. Whether all this adds up to still "having the bubble" remains to be seen.

## 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,



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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.

*Equity Markets*

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



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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 (Current Dividend Yield x 100) x (1+ Forecast Productivity Growth) divided by (Current Yield on Real Return Bonds + Equity Risk Premium - Forecast Productivity Growth). Our valuation estimates are shown in the following tables, where a value greater than 100% implies overvaluation, and less than 100% implies



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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 26 Feb 10***

| *Australia* | Low Demanded Return | High Demanded Return |
|---|---|---|
| **High Supplied Return** | 71% | 104% |
| **Low Supplied Return** | 106% | 144% |

| *Canada* | Low Demanded Return | High Demanded Return |
|---|---|---|
| **High Supplied Return** | 71% | 124% |
| **Low Supplied Return** | 130% | 195% |

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| *Eurozone* | Low Demanded Return | High Demanded Return |
|---|---|---|
| **High Supplied Return** | 49% | 84% |
| **Low Supplied Return** | 83% | 123% |

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| *Japan* | Low Demanded Return | High Demanded Return |
|---|---|---|
| **High Supplied Return** | 85% | 143% |
| **Low Supplied Return** | 156% | 231% |

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| *United Kingdom* | Low Demanded Return | High Demanded Return |
|---|---|---|
| **High Supplied Return** | 31% | 69% |
| **Low Supplied Return** | 65% | 109% |

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| *United States* | Low Demanded Return | High Demanded Return |
|---|---|---|
| **High Supplied Return** | 86% | 149% |
| **Low Supplied Return** | 165% | 248% |

| *Switzerland* | Low Demanded Return | High Demanded Return |
|---|---|---|
| High Supplied Return | 80% | 136% |
| Low Supplied Return | 147% | 254% |

| *India* | Low Demanded Return | High Demanded Return |
|---|---|---|
| High Supplied Return | 72% | 170% |
| Low Supplied Return | 208% | 355% |

| *Emerging Markets* | Low Demanded Return | High Demanded Return |
|---|---|---|
| High Supplied Return | 100% | 199% |
| Low Supplied Return | 145% | 245% |

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 past few months have seen a very strong rally develop in many equity markets, which, in some cases,



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has caused our valuation estimates to rise into the "overvalued" region. Given the absence of progress in reducing the three main obstacles that block a return to sustainable economic growth (see our Economic Update), we believe that these rallies reflect investor herding (and the incentives of many professional investment managers to deliver positive returns on 2008's disastrous end-of-year base), rather than any improvement in the underlying fundamentals.

## *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



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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 counts. Hence, in our analysis, we assume that future economic growth reflects the growth in the labor force and TFP.

Unfortunately, this rate of future growth is not guaranteed; rather, 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 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



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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 **26 Feb 10**:

| Region | Risk Free Rate Demanded | Actual Risk Free Rate Supplied | Difference | Overvaluation (>100) or Undervaluation (<100) |
|---|---|---|---|---|
| Australia | 2.2 | 2.7 | 0.5 | 95 |
| Canada | 2.8 | 1.5 | -1.2 | 113 |
| Eurozone | 2.9 | 1.6 | -1.3 | 114 |
| Japan | 2.8 | 1.7 | -1.1 | 112 |
| United Kingdom | 2.8 | 0.7 | -2.1 | 123 |
| United States | 2.5 | 1.5 | -1.0 | 110 |

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 mode 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



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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 Bond Markets*

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. We use the latter 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 26 Feb 10***

| | Current Real Rate* | Average Inflation Premium (89-03) | Required Nominal Return | Nominal Return Supplied (10 year Govt) | Yield Gap | Asset Class Over or (Under) Valuation based on 10 year zero | Implied Annual Inflation Rate over 10 year time horizon = (1+Nom)/(1+Real)-1 |
|---|---|---|---|---|---|---|---|



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| | Current Real Rate* | Average Inflation Premium (89-03) | Required Nominal Return | Nominal Return Supplied (10 year Govt) | Yield Gap | Asset Class Over or (Under) Valuation based on 10 year zero | Implied Annual Inflation Rate over 10 year time horizon = (1+Nom)/(1+ Real)-1 |
|---|---|---|---|---|---|---|---|
| Australia | 2.67% | 2.96% | 5.63% | 5.49% | -0.14% | 1.35% | 2.74% |
| Canada | 1.53% | 2.40% | 3.93% | 3.38% | -0.55% | 5.44% | 1.82% |
| Eurozone | 1.60% | 2.37% | 3.97% | 3.10% | -0.87% | 8.76% | 1.48% |
| Japan | 1.66% | 0.77% | 2.43% | 1.31% | -1.12% | 11.61% | -0.34% |
| UK | 0.75% | 3.17% | 3.92% | 4.03% | 0.11% | -1.07% | 3.26% |
| USA | 1.51% | 2.93% | 4.44% | 3.61% | -0.83% | 8.27% | 2.07% |
| Switz. | 1.62% | 2.03% | 3.65% | 1.91% | -1.74% | 18.44% | 0.29% |
| India | 1.62% | 7.57% | 9.19% | 7.97% | -1.22% | 11.90% | 6.25% |

*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 is especially true today, when the world economy is operating in unchartered waters, and is facing both potential 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). 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



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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).

To help readers to put the current situation in perspective, we also include in the table above 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). The following table, shows historical average inflation rates (and their standard deviations) for the U.K. and U.S. over longer periods of time, and helps to put our government bond valuation analysis (and inflation assumptions) into a broader context:

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

In sum, 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, during which inflation should either be low or negative (i.e., during which we may actually experience a prolonged period of deflation), one can make the case that many government bond markets are significantly undervalued today. When it comes to questions about 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



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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, 2008 (based on daily Federal Reserve data – 11,642 data points). Particularly in the case of the BAA spread, it is clear we are not dealing with a normal distribution!

| | **AAA – 10 Year Treasury** | **BAA-AAA** |
|---|---|---|
| Average | 1.20% | .94% |
| Standard Deviation | .44% | .34% |
| Skewness | .92 | 3.11 |
| Kurtosis | .53 | 17.80 |

At **26 Feb 10**, the AAA minus 10 year Treasury spread was 1.60%. The AAA minus BAA spread was 1.02%. Since these distributions are not normal (i.e., they do not have a "bell curve" shape), we take a different approach to were been only 1,002 days with a higher AAA spread (8.6% of all days) and 1,725 days with a higher BAA spread (14.8% of all days in our sample). Current spreads still reflect a high degree of investor uncertainty about future liquidity and credit risk, despite the declines in the BBB and AAA spreads from their crisis highs. However, given the unchartered economic waters through which we are still passing, and our belief that the conventional wisdom underestimates the amount of trouble on the horizon, we believe that these spread possibly reflect the underpricing of liquidity and credit risk – or, to put



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it differently, the overpricing of AAA and BBB rated bonds – on a one year time horizon. We also note the high liquidity risk spread, in contrast to the relatively lower credit spread. Something here doesn't add up, and we suspect it is the underpricing of credit risk.

Over a longer term time horizon, where risk premiums return to more normal levels, one can argue that credit is underpriced today, based on prevailing yields. However, the validity of that conclusion also 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 credit spreads and their long-term averages are well under 100 basis points today, it doesn't take much mis-estimation of future default rates (and 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 is at best fully valued today, and quite possibly overpriced, given the 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



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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 26 Feb 10***

| | To AUD | To CAD | To EUR | To JPY | To GBP | To USD | To CHF | To INR |
|---|---|---|---|---|---|---|---|---|
| From | | | | | | | | |
| **AUD** | 0.00% | -2.11% | -2.39% | -4.18% | -1.46% | -1.88% | -3.58% | 2.48% |
| **CAD** | 2.11% | 0.00% | -0.28% | -2.07% | 0.65% | 0.23% | -1.47% | 4.59% |
| **EUR** | 2.39% | 0.28% | 0.00% | -1.79% | 0.93% | 0.51% | -1.19% | 4.87% |
| **JPY** | 4.18% | 2.07% | 1.79% | 0.00% | 2.72% | 2.30% | 0.60% | 6.66% |
| **GBP** | 1.46% | -0.65% | -0.93% | -2.72% | 0.00% | -0.42% | -2.12% | 3.94% |
| **USD** | 1.88% | -0.23% | -0.51% | -2.30% | 0.42% | 0.00% | -1.70% | 4.36% |
| **CHF** | 3.58% | 1.47% | 1.19% | -0.60% | 2.12% | 1.70% | 0.00% | 6.06% |
| **INR** | -2.48% | -4.59% | -4.87% | -6.66% | -3.94% | -4.36% | -6.06% | 0.00% |

*Commercial Property*



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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 **26 Feb 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 (Current Dividend Yield x 100) x (1+ Forecast NOI Growth) divided by (Current Yield on Real Return Bonds + Property Risk Premium - Forecast NOI Growth). Our



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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 | 6.4% | 0.2% | 6.6% | 2.7% | 3.0% | 5.7% | 85% |
| Canada | 6.2% | 0.2% | 6.4% | 1.5% | 3.0% | 4.5% | 70% |
| Eurozone | 4.1% | 0.2% | 4.3% | 1.6% | 3.0% | 4.6% | 106% |
| Japan | 6.3% | 0.2% | 6.5% | 1.7% | 3.0% | 4.7% | 70% |
| Switzerland* | 3.6% | 0.2% | 3.8% | 1.6% | 3.0% | 4.6% | 124% |
| U.K. | 4.4% | 0.2% | 4.6% | 0.7% | 3.0% | 3.7% | 80% |
| U.S.A. | 4.2% | 0.2% | 4.4% | 1.5% | 3.0% | 4.5% | 102% |

**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, a number of commercial property markets still look underpriced today, despite the sharp recent increase in property share prices in many countries. Over the next twelve months, however, we believe the balance of risks points in the other 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. In sum, we believe that the recent sharp run up in property security prices is yet another sign of some



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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. The exception to our general view may come in Switzerland and the Eurozone, where rising insecurity often triggers an increased allocation to property, on the basis of traditional wealth preservation principles.

*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



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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



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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. This highlights a key point about commodity futures index funds – because of the critical impact of the commodities they include, the weights they give them, and their rebalancing and rolling strategies, they are, in effect, uncorrelated alpha strategies. Moreover, because of changing supply and demand conditions in many commodities (e.g., global demand has been growing, while marginal supplies are more expensive to develop and generally have long lead times),



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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 **26 Feb 10**:

| **Commodity** | **DJAIG Weight** | **Current Status** |
|---|---|---|
| Crude Oil | 13.8% | Contango |
| Natural Gas | 11.9% | Contango |
| Gold | 7.9% | Contango |
| Soybeans | 7.6% | Contango |
| Copper | 7.3% | Contango |
| Aluminum | 7.0% | Contango |
| Corn | 5.7% | Contango |
| Wheat | 4.8% | Contango |
| Live Cattle | 4.3% | Backwardated |
| Unleaded Gasoline | 3.7% | Contango |
| | *74.0%* | |

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. That said, on a weighted basis, the forward premium (relative to the spot price) fell last month, to .65%, from .94% last month, .90% two months ago, and 1.23% three months ago. Finally, we also note that when futures are contangoed, commodity funds that can take short as well as long positions may still deliver positive returns.

The third source of commodity futures return is unexpected changes in the price of the commodity during the term of the futures contract. It is important to stress that the market's consensus about the expected change in the spot price is already included in the futures price. The source of return we are referring to here is the



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unexpected portion of the actual change. This return driver probably offers 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).

Again, large surprises seem more likely when supply and demand and finely balanced – the same conditions which can also give rise to changes in real option values and positive roll returns. Given our economic outlook, at this point we view negative surprises on the demand side that depress commodity prices as more likely than supply surprises that have the opposite effect.

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 sudden changes in demand (where downside



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surprises currently seem more likely than upside surprises) and/or supply (where the best chance of a positive return driver seems to be incomplete investor recognition of slowing oil production from large reservoirs and/or the medium term impact of the current sharp cutback in E&P and refining investments).

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 2008, the inflation adjusted (i.e., real) DJAIG had an average value of 91.61, with a standard deviation of 16.0 (skewness of .52, and kurtosis of -.13 – i.e., it was close to normal). The inflation adjusted **26 Feb 10** closing value of 84.44 was .41 standard deviations below 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 one's outlook for future roll returns and price surprises, and, critically, the time horizon being used.

There are three arguments that, on a medium term 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 equally large amount of fiscal stimulus being applied to the global economy, with its focus on infrastructure projects, should eventually boost demand for commodities (and indirectly boost economic growth in commodity exporting countries like Australia and Canada). 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 overvalued today on a medium term view is based on the belief that (a) investment in clean fuels and other changes in environmental regulation will cause a permanent reduction in global demand for oil relative to supply; (b) the inability to quickly resolve the economic challenges facing the world economy will result in a prolonged period of weak or no growth, which will reduce the demand for commodities; and (c) that in



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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. Taking all of these arguments into consideration, the valuation question comes down to the probabilities one attaches to a decline in global demand from today's relatively weak levels (which would cause commodities prices to fall) and the development of a crisis of confidence in the U.S. dollar (which would cause commodities prices to rise). On balance, we believe that the former is more likely than the latter, 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 commodities are possibly overvalued today.

On the other hand, gold prices benefit both from rising investor uncertainty and/or worries about future inflation. Since both of these are increasing, gold prices should benefit from higher retail flows into the expanding range of gold ETF products that make easier to invest in this commodity. Hence we conclude that gold may (still) be possibly undervalued today, on a one year time horizon.

*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, tor 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.



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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



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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, Travisi, 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:

| **Growth Driver** | **Assumption** |
|---|---|
| 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 |



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| Growth Driver | Assumption |
|---|---|
| | 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 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, *Science*, 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



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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 at least part 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 **26 Feb 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 (Current Dividend Yield x 100) x (1+ Forecast Dividend Growth) divided by (Current Yield on Real Return Bonds + Timber Risk Premium - Forecast Dividend Growth). A value greater than 100% implies overvaluation, and less than 100% implies undervaluation.

| | |
|---|---|
| Average Dividend Yield (70% PCL + 30% RYN) | 4.80% |
| 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 | **5.80%** |
| Real Bond Yield | 1.51% |
| Plus Risk Premium for Timber | 3.00% |
| Equals Average Annual Real Return Demanded | **4.51%** |
| Ratio of Returns Demanded/Returns Supplied Equals Valuation Ratio (less than 100% implies undervaluation) | **72%** |



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We stress that this is a long-term valuation estimate that contains a higher degree of uncertainty that 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 proxied 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 CO2 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 actually 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 CO2 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. On a one-year view, however, we are neutral, with downward timber price risk (due to continuing economic weakness) balanced against the upside potential inherent in pending environmental legislation.

*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



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commodities. Between January 2, 1990 and December 30, 2008, the average daily value of the VIX Index was 19.70, with a standard deviation of 7.88 (skewness 2.28, kurtosis 9.71 – i.e., a very "non-normal" distribution). On **26 Feb 10**, the VIX closed at 19.50, To put this in perspective, 44% of the days in our sample had higher closing values of the VIX. We continue to believe that, in the short term – say, over the next 12 months – this may prove to be too low, if investors' expectations that the normal regime will continue eventually meet with disappointment as the conflict scenario and/or a worsening global influenza pandemic develops. As we noted above with respect to commodities, despite the likely impact of fiscal stimulus on aggregate demand, and monetary growth on price levels (i.e., reducing the risk of prolonged deflation), the core issues that lie at the heart of the current recession remain unresolved. We have also noted in this month's journal that the probability of a return to the high uncertainty regime is rising. Critically, we do not believe that this information and its likely impact on future uncertainty levels has been fully incorporated into S&P 500 option prices, and hence into the VIX. For these reasons as of **26 Feb 10** we estimate that volatility is probably underpriced over a short-term time horizon. However, over a longer-term time horizon, volatility is possibly overpriced today. We hesitate to take a stronger stance on this issue, because we believe 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.



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## 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”



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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.



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

| ***Rolling 3 Month Returns Through*** | ***26 Feb 10*** | | | |
|---|---|---|---|---|
| ***Economy*** | Bottoming | Strengthening | Peaking | Weakening |
| ***Interest Rates*** | Falling | Bottom | Rising | Peak |
| ***Style and Size Rotation*** | Small Growth (DSG) **10.59%** | Small Value (DSV) **9.62%** | Large Value (ELV) **0.51%** | Large Growth (ELG) **3.98%** |
| ***Sector Rotation*** | Cyclicals (RXI) **3.27%** | Industrials (EXI) **3.23%** | Staples (KXI) **1.00%** | Utilities (JXI) **-3.76%** |
| ***Bond Market Rotation*** | Higher Risk (HYG) **3.65%** | Short Maturity (SHY) **0.11%** | Low Risk (TIP) **-1.88%** | Long Maturity (TLT) **-4.15%** |

## Product and Strategy Notes

- As we have written many times in the past, the allocation of scarce investor attention is an issue that is both critical and underexplored by researchers intent on explaining investment performance. A recent paper sheds further light on this issue. In "Attention Allocation Over the Business Cycle", Kacperczyk, van Nieuwerburgh, and Veldkamp "develop a model that uses an observable variable – the state of the business cycle – to predict attention allocation, which in turn predicts aggregate investment patterns." The authors' hypothesis is "that recessions and expansions imply different optimal attention allocation strategies for skilled investment managers. Different learning strategies, in turn, prompt different investment strategies, causing differential performance in recessions and expansions." Investment managers can choose to allocate their attention



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between two broadly different types of information: "aggregate signals, like macroeconomic date, affect the future cash flows of all firms", while stock specific signals contain information that is useful for forecasting the portion of firm cash flow that is independent of changes in the macroeconomic environment. The authors note that "as in most learning problems, risks that are large in scale and high in volatility are more valuable to learn about." In this framework, "macroeconomic shocks are usually large in scale but have low volatility, while firm specific shocks are smaller in scale but have higher volatility." However, this changes in a recession, when macroeconomic shocks increase in volatility. Hence, skilled investment managers should "devote relatively more attention to aggregate shocks during recessions, and to stock specific shocks during expanstions." If this conjecture is true, then in expansions, skilled investment managers' portfolios should be "largely similar to the market portfolio, except for their weights on the stocks they follow." As a result, during expansions, "the returns earned by skilled and unskilled investors should only differ modestly from each other." In contrast, during recessions skilled managers use their superior information allocation to adjust their holdings of all stocks; consequently, we should observe more dispersion of returns between skilled and unskilled managers during recessions. The authors test these predictions using data on the performance and portfolio holdings of actively managed U.S. mutual funds between 1980 and 2005. They find that their hypotheses are supported. Interestingly, the authors find that "gross alphas (before fees) are not statistically different from zero in expansions, but are positive in recessions. Net alphas (after fees) are negative in expansions an positive in recessions. They also conclude that the data are "consistent with a world in which a small fraction of investment managers have skill, that is, on average, hard to detect." That said, the authors conclude that skilled investment managers are most easy to detect during recessions, and results, in part, from the different way they allocate their attention.



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- MSCI Barra recently published a research report that provides some good food for thought. Titled "What Drives Long Term Equity Returns?", it analyzes long-run returns in a variety of equity markets between 1975 and 2009, and decomposes nominal geometric average returns into inflation, dividends, real book value growth, and changes over time in the price to book (P/B) ratio. Taking inflation' impact out of the mix, the following table highlights the relative contributions of different drivers of long-term equity returns. It also shows the current dividend yield in these markets.

| Market | Dividends | Book Value Growth | Changes in P/B | Current Div Yld 29Jan10 |
|---|---|---|---|---|
| Australia | 4.3% | 1.2% | 4.2% | 3.9% |
| Europe | 3.6% | 1.7% | 2.3% | 3.6% (Eurobloc) |
| Japan | 1.3% | 1.7% | 2.3% | 2.1% |
| UK | 4.1% | 0.8% | 4.2% | 3.4% |
| USA | 3.2% | 1.8% | 1.7% | 1.9% |

From our perspective, this table has some very sobering implications for what may lie ahead for many global equity markets. As you can see, current dividend yields are generally below the levels that drove a significant proportion of real equity returns over the past 34 years. Absent a sharp increase in growth, which clearly seems unlikely given the challenges facing the global economy, it appears that many equity markets will have to experience substantial falls in price (i.e., reductions in the P/B ratio), in order to restore attractive dividend yields and expected future returns.

- We recently read two new articles that added further to the growing concern we have about the implications of increased volumes of algorithmic trading for the future success of many active investment management strategies. As the Financial Times noted on 17Feb10 (in "Markets: Ghosts in the Machine" by Grant and Mackenzie), "advances in technology have been so great in the past five years that markets are now overwhelmingly driven by machines rather than human beings



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punching orders into a keyboard...According to the Tabb Group, algorithmic and high frequency trading accounts for more than 60 percent of activity in U.S. equity markets today." The second article was "Algorithm Switching: Co-Adaptation in the Market Ecology" by Stephens and Waelbroeck, which describes how complex adaptive systems techniques are being used to guide the automatic switching between trading algorithms (e.g., between one based on fundamental valuation and another based on trend following, or between different approaches to executing a given trade). As repeated simulations of agent based financial markets have shown (e.g., see "The Price Dynamics of Common Trading Strategies" by Farmer and Joshi), this type of switching usually leads to boom and bust cycles, along with heightened volatility. Of equal concern, at least for active managers, should be the rapid increase in the sophistication of the algorithms being used to drive trading and, more broadly, quantitative investment strategies more generally. Today's technology goes far beyond the automatic classification and analysis of terabytes quantitative data like financial statements, trading records, and macroeconomic and earnings announcements to identify ever more subtle predictive signals that can be turned into profits. For example, the leaps that have been made in the analysis of unstructured textual data have been enormous – Google and Bing's increasingly sophisticated search algorithms being just one small example of the advances that have occurred. Next, add to these radically improved processing capabilities the much deeper understanding that is now available not just into the cognitive processing errors that human beings often make, but also into the neurobiological roots of the emotions that they feel under different circumstances, and how these affect their behavior. Finally, add the automatic updating and improvement of algorithms via genetic and other evolutionary techniques. What you end up with are quantitative strategies that relentlessly seek out and profitably exploit the asset pricing mistakes and emotion fueled trends that occur in financial markets, and that relentlessly improve their own ability to achieve these objectives. Indeed, it is not a far stretch to conjecture that the most sophisticated algorithms in use today may actually seek to mimic



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some of the mistakes made by human investors in order to set off trends that can subsequently be profitably exploited. If human beings can do this via credit default swaps and bear raids, why can't algorithms do it too?

In our view, this new investing environment makes a mockery of 99% of the market commentary one hears every day ("Well, Jane, the XYZ sector appeared to be overbought today, and so we saw some profit taking there after ABC's earnings release yesterday"). More importantly, we think it is fundamentally changing the nature of investor's challenge when it comes to evaluating the performance of active managers. Does an apparently successful manager's results reflect real skill in developing superior information and/or a superior analytical model, or does his or her success really just amount to having bet (albeit without knowing it) on the right quantitative trading strategy as the battle of the algorithms plays out in markets around the world? Closely related to this is another jarring paper we recently read, "Gaming Performance Fees by Portfolio Managers" by Foster and Young. In the absence of transparency with respect to security holdings and trading strategies, the authors conclude that "there exists no compensation mechanism that can separate skilled from unskilled managers solely on the basis of their return histories." Put differently, absent transparency, the authors conclude that it is possible for unskilled managers who seek to mimic the performance record of truly skilled managers to get away with this imitation for a significant period of time before his or her lack of skill is discovered. Indeed, another recent paper ("Unbeatable Imitation" by Duersch, Oechssler, and Schipper) shows that a simple decision rule, "imitate the best", appears to have many evolutionary advantages. However, in our brave new world of quantitative trading, the mimic may not even realize this is what is happening! If there is an analogy here, perhaps it is to the world of lending, which has also been radically transformed by algorithmic approaches over the 30 years since I first learned about the "5 Cs of Credit." Improvements in information and communication technology were a critical enabler of the disintermediation of substantial amounts of bank lending by



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the credit markets. So too, algorithms were at the heart of the great consolidation that occurred in credit card, mortgage, auto and student lending that we have seen, as well as the rise of securitization and the use of increasingly risk management models that justified the sharp increase of leverage by highly interconnected market making institutions at the heart of the system. Unfortunately, we know how this story ended. What we don't know yet is where the increasing use of quantitative strategies throughout the investing world will lead us. What we do know, however, is that in this brave new world both active management success and the ability to distinguish skill from imitation from luck are becoming much more difficult, while spending more on hedging volatility and uncertainty risk seems increasingly prudent.

New Products

- There are growing indications that we are moving closer to the day when longevity risk is an investable asset class for retail investors. Recent developments include the launch of an industry trade association (the Life and Longevity Markets Association, or LLMA), and a range of initiatives to create longevity risk indexes (in addition to JP Morgan's LifeMetrics product) that could serve as the basis for investable products. Natural buyers of longevity risk insurance are pension funds, and sellers of annuities, while natural sellers are life insurers and reinsurers (though their appetite will be tempered to the extent they are also sellers of annuities). As numerous commentators have pointed out, life insurers' capacity to absorb longevity risk is much smaller than the likely number of pension funds wishing to hedge it. Hence, there is an opportunity to introduce investable instruments. The challenge, of course, will be developing methods to help investors determine whether they are being adequately compensated for the risk longevity risk they are taking on. Given the uncertain potential impact of new drugs, this would appear to be a difficult risk to quantify and price.



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- Over the past two years, we have seen the development of two trends in the ETF market that we find disturbing. The first is the growing number of "fund of funds" (or ETFs of ETFs) products. An example of this in the United States is a recently launched ETF from IndexIQ (ticker CPI) that offers a bundled package of inflation hedging products, including ETFs that track real return bonds, gold, foreign exchange, and commodities. From an asset allocation perspective, we aren't fans of this type of bundled product as it just makes the interaction between different asset classes more opaque and difficult to manage – beyond the higher cost compared to purchasing the underlying ETFs separately. We draw a contrast between funds like this and funds like MDLOX and PASAX that employ a wide range of broadly defined asset class products to deliver what is essentially a global macro/tactical asset allocation type uncorrelated alpha product. The second disturbing trend has been the explosion of ETF products that track ever more narrowly defined indexes, which in turn has apparently convinced many people who previously spent their careers touting "can't fail" systems for picking real estate or stocks, to apply their approach in the world of ETFs. What really torques us is the nagging worry that too many investors are using ETFs to feed their (very costly) need for a trading fix (or get rich quick dream) while comforting themselves that they are somehow more virtuous because they are now an "index investor" rather than simply gambling on stocks. To give him credit, Jack Bogle voiced this concern years ago when ETFs were first introduced, and we fear that, once again, his forecasts are proving all-too-prescient.

## Advisers' Corner

"What makes clients tick?" is an age old question that is constantly producing both new and old answers. A series of papers we recently read is no exception to this rule. In "Amygdala Damage Eliminates Monetary Loss Aversion", De Martino, Camerer and Adolphs describe a study that provides more evidence that the amgydala (a primitive part of our brains that controls our sense of fear) plays a significant role in the generation of human beings' aversion to loss. Previous research, which we have also



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written about over the years, has also linked the amygdala to the feelings of fear triggered by heightened uncertainty and social isolation. We continue to believe that studies such as this will eventually lead to a more fully developed "sub-atomic" theory of financial market behavior. Along this same line, another recent article ("A Frightful Genetic Twist" by Greg Miller) reports on other research that found that 30% of Caucasians have an alteration in the BDNF gene that leads to a heightened fear response. Speaking of the impact of genetics, in "Genetic Variation in Financial Decision Making", Ceasrini, Jaohannesson, et al ask whether genetic variation can explain some portion of the observed differences in people's portfolio asset allocation decisions. They conclude that genetic variation accounts for approximately 25% in the variation in individual's willingness to take risk and also to engage in returns chasing (trend following) behavior. The authors also note that, due to increasing assortative mating (marrying someone quite like oneself) in societies with widening degrees of social separation, the genetically driven component of risk (and, presumably, loss and uncertainty aversion) may well increase in the future. Finally, Bill Bernstein, whose professional training is in neurology, has an excellent article in the January/February issue of the *Financial Analysts Journal* ("Of Laws, Lending and Limbic Systems"). Given our interest in the neurobiological roots of investor behavior, we were particularly interested in his discussion of the powerful influence of the human nucleus accumbens, which is responsible for our anticipation of future reward. As Bernstein notes, "to label the nucleus accumbens our 'greed center' is not too much of an exaggeration...Although he did not know it at the time, Charles Kindelberger clearly had the nucleus accumbens in mind when he uttered his most famous bon mot: 'There is nothing so disturbing to one's well-being and judgment as to see a friend get rich.'" As Bernstein notes, and as we have written in the past, the critical neurbiological dynamic that underlies investor behavior is the ongoing contest for primacy between the feelings of greed and desire for reward engendered by the nucleus accumbens, and the fear of uncertainty, loss and social isolation produced by the amygdala, both of which occur out of reach of our conscious, rational brain.



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Advisers know that word of mouth and other references from existing clients is a powerful means of attracting new ones. But what triggers powerful word of mouth responses from existing clients? Another recent research paper provides some insights into the answer to that age-old question. In "Social Transmission and Viral Culture", Berger and Milkman report on their study of the articles published in the *New York Times* that were most frequently emailed from one reader to another. One key driver was the extent to which an article inspired awe. As the authors note, "stimuli that open the mind to vast and often unconsidered possibilities can inspire awe, a unique human emotion that expands a reader's frame of reference. Awe is the emotion of self-transcendence, a feeling of admiration and elevation in the face of something greater than the self. It occurs when two conditions are met: First, people experience something vast: either physically vast such as the Grand Canyon, conceptually vast such as a grand theory or finding, or socially vast such as fame or power. Second, the vast experience cannot be accommodated by existing mental structures. Intellectual epiphanies, natural wonders, and great works of art can all make people feel a sense of awe." Other stories that were frequently emailed were those that were "more surprising, practically useful, emotion-laden, or positive articles."

Finally, we call your attention to two new research studies. The first is by Angela Hung and Joanne Yoong of RAND. In "Asking for Help", they use a combination of survey and experimental evidence to show that "unsolicited or automatic advice [e.g. required meetings of 401(k) plan participants with financial advisers] has no effect on investment behavior and outcomes. However, individuals who actively solicit advice ultimately change their behavior and improve their performance." The second study is by Andy Terry and Ashvin Vibhakar of the University of Arkansas at Little Rock. They have published a very informative article on "A Comparative Analysis of the CFA and CFP Designations". We highly recommend it to our readers.



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## 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 EUR cash benchmark is 0.80% (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/Europe.php



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