Retired Investor

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Contents

July 2010 Issue: Key Points

This month we conclude our two part series on Understanding and Predicting Uncertainty Shocks. We examine the root causes of these shocks, which lie in the dynamics of both our cognitive and emotional processes, as well as the social networks in which we participate. We then examine the extent to which these dynamics are predictable. We conclude that rather than simply throwing up our hands and blaming shocks on unpredictable black swans, we can, albeit at a coarse-grained level, develop some insight as to the changing level of "shock probability." Our feature article ends with a review of how investors can gain an advantage by improving their relative ability to respond to uncertainty shocks.

This month's Economic Update reviews the complex forces that are currently at work in the world economy, including deleveraging, insufficient aggregate demand, the

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rising threat of deflation, and the impact of all of these on the legitimacy of both the current global system, and quite possibly a number of domestic systems as well. We analyze how these could combine into different scenarios, and take a detailed look at the likely impact on different asset class returns.

In this month's product and strategy notes, we review new research on the fundamental valuation of gold, and conclude that the gold market is likely in an increasingly fragile state, with an elevated risk of a sharp downside move in prices in the absence of new information that raises investors feelings of uncertainty and fear. In particular, we believe that perceptions of the creditworthiness of U.S. Treasury securities will have a critical impact on gold prices going forward. Our second product and strategy note is our Advisers' Corner, where we summarize a large number of new research papers that should be of interest to subscribers who manage money for high net worth clients.

Global Asset Class Returns

YTD30Jun10	**In USD**	**In AUD**	**In CAD**	**In EUR**	**In JPY**	**In GBP**	**In CHF**	**In INR**
Asset Held								
USD Bonds	5.71%	11.79%	7.05%	20.34%	0.50%	13.06%	9.84%	5.51%
USD Prop.	11.44%	17.52%	12.78%	26.07%	6.24%	18.80%	15.58%	11.24%
USD Equity	-6.00%	0.08%	-4.66%	8.63%	-11.20%	1.36%	-1.86%	-6.20%
AUD Bonds	-0.02%	6.06%	1.32%	14.61%	-5.23%	7.33%	4.11%	-0.22%
AUD Prop.	-6.89%	-0.81%	-5.55%	7.74%	-12.10%	0.46%	-2.76%	-7.09%
AUD Equity	-15.96%	-9.88%	-14.62%	-1.33%	-21.17%	-8.61%	-11.83%	-16.16%
CAD Bonds	2.57%	8.65%	3.91%	17.20%	-2.63%	9.93%	6.71%	2.37%
CAD Prop.	4.00%	10.08%	5.34%	18.63%	-1.20%	11.36%	8.14%	3.81%
CAD Equity	-3.34%	2.74%	-2.00%	11.29%	-8.54%	4.02%	0.80%	-3.53%
CHF Bonds	0.90%	6.98%	2.24%	15.53%	-4.30%	8.26%	5.04%	0.70%
CHF Prop.	5.56%	11.64%	6.90%	20.18%	0.35%	12.91%	9.69%	5.36%
CHF Equity	0.00%	6.08%	1.34%	14.63%	-5.20%	7.36%	4.14%	-0.20%
INR Bonds	8.53%	14.61%	9.87%	23.16%	3.33%	15.89%	12.67%	8.34%
INR Equity	1.18%	7.26%	2.52%	15.81%	-4.02%	8.54%	5.32%	0.99%
EUR Bonds	-6.34%	-0.26%	-5.00%	8.29%	-11.55%	1.01%	-2.21%	-6.54%

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YTD30Jun10	In USD	In AUD	In CAD	In EUR	In JPY	In GBP	In CHF	In INR
EUR Prop.	-13.84%	-7.76%	-12.50%	0.79%	-19.05%	-6.49%	-9.71%	-14.04%
EUR Equity	-23.81%	-17.72%	-22.46%	-9.18%	-29.01%	-16.45%	-19.67%	-24.00%
JPY Bonds	7.20%	13.28%	8.54%	21.83%	2.00%	14.56%	11.34%	7.00%
JPY Prop.	6.59%	12.67%	7.93%	21.22%	1.39%	13.95%	10.73%	6.40%
JPY Equity	-5.54%	0.54%	-4.20%	9.09%	-10.75%	1.81%	-1.41%	-5.74%
GBP Bonds	-1.58%	4.50%	-0.24%	13.05%	-6.79%	5.77%	2.55%	-1.78%
GBP Prop.	-20.21%	-14.13%	-18.87%	-5.59%	-25.42%	-12.86%	-16.08%	-20.41%
GBP Equity	-13.68%	-7.60%	-12.34%	0.95%	-18.88%	-6.32%	-9.54%	-13.87%
1-3 Yr USGvt	1.87%	7.95%	3.21%	16.50%	-3.34%	9.22%	6.00%	1.67%
World Bonds	-1.45%	4.63%	-0.11%	13.18%	-6.65%	5.91%	2.69%	-1.64%
World Prop.	-3.82%	2.27%	-2.47%	10.81%	-9.02%	3.54%	0.32%	-4.01%
World Equity	-9.91%	-3.83%	-8.57%	4.72%	-15.11%	-2.55%	-5.77%	-10.10%
Commod Long Futures	-10.93%	-4.85%	-9.59%	3.70%	-16.14%	-3.58%	-6.80%	-11.13%
Commod L/Shrt	-13.08%	-7.00%	-11.74%	1.55%	-18.28%	-5.72%	-8.95%	-13.28%
Gold	13.39%	19.47%	14.73%	28.02%	8.19%	20.75%	17.53%	13.20%
Timber	-2.40%	3.69%	-1.05%	12.23%	-7.60%	4.96%	1.74%	-2.59%
Uncorrel Alpha	-0.52%	5.56%	0.82%	14.11%	-5.72%	6.84%	3.62%	-0.71%
Volatility VIX	77.40%	83.48%	78.74%	92.03%	72.20%	84.76%	81.54%	77.21%
Currency								
AUD	-6.08%	0.00%	-4.74%	8.55%	-11.29%	1.27%	-1.95%	-6.28%
CAD	-1.34%	4.74%	0.00%	13.29%	-6.55%	6.01%	2.79%	-1.54%
EUR	-14.63%	-8.55%	-13.29%	0.00%	-19.83%	-7.27%	-10.49%	-14.82%
JPY	5.20%	11.29%	6.55%	19.83%	0.00%	12.56%	9.34%	5.01%
GBP	-7.36%	-1.27%	-6.01%	7.27%	-12.56%	0.00%	-3.22%	-7.55%
USD	0.00%	6.08%	1.34%	14.63%	-5.20%	7.36%	4.14%	-0.20%
CHF	-4.14%	1.95%	-2.79%	10.49%	-9.34%	3.22%	0.00%	-4.33%
INR	0.20%	6.28%	1.54%	14.82%	-5.01%	7.55%	4.33%	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

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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 30Jun10	**In USD**	**In AUD**	**In CAD**	**In EUR**	**In JPY**	**In GBP**	**In CHF**	**In INR**
Eq Mkt Neutral								
HSKAX	-1.79%	4.29%	-0.45%	12.84%	-7.00%	5.57%	2.34%	-1.99%
OGNAX	-3.29%	2.79%	-1.94%	11.34%	-8.49%	4.07%	0.85%	-3.48%
Arbitrage								
ARBFX	-0.71%	5.37%	0.63%	13.92%	-5.91%	6.65%	3.43%	-0.90%
ADANX	0.74%	6.82%	2.08%	15.37%	-4.46%	8.10%	4.88%	0.55%
Currency								
DBV	-7.43%	-1.35%	-6.09%	7.20%	-12.64%	-0.08%	-3.30%	-7.63%
ICI	-0.53%	5.56%	0.82%	14.10%	-5.73%	6.83%	3.61%	-0.72%
Equity L/S								
HSGFX	5.24%	11.32%	6.58%	19.87%	0.04%	12.60%	9.38%	5.05%
PTFAX	4.49%	10.58%	5.84%	19.12%	-0.71%	11.85%	8.63%	4.30%
GTAA								
MDLOX	-4.64%	1.44%	-3.30%	9.99%	-9.84%	2.72%	-0.50%	-4.83%
PASAX	2.71%	8.80%	4.06%	17.34%	-2.49%	10.07%	6.85%	2.52%

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

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governed by constant natural laws. Instead, they are complex adaptive systems, in which positive feedback loops and non-linear effects are common, due to the interaction of competing investment strategies (e.g., value, momentum, arbitrage and passive approaches), and investor decisions that are made on the basis of incomplete information, by individuals with limited cognitive capacities, who are often pressed for time, affected by emotions, and subject to the influence of other people. We further believe that these interactions give rise to three different regimes in financial markets that are characterized by very different asset class return, risk, and correlation parameters. We term these three regimes "High Uncertainty", "High Inflation" and "Normal Times."

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

We believe that investors are best served when their primary performance benchmark is the long-term real return their portfolio must earn in order to achieve their long term financial goals. We believe the best way to implement this approach is via a portfolio of broadly defined, low cost, low turnover, asset class index products that provide exposure to a diversified mix of underlying return generating processes.

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In this context, conservatively managing risk in order to avoid large losses is mathematically more important than taking aggressive risk position to reach for additional returns via actively managed strategies. This is not to say that in some cases investors would benefit from those additional active returns. Such cases typically involve aggressive goals, low starting capital, low savings, and/or a short time horizon. In these situations, it is mathematically clear that an allocation to certain actively managed investment strategies can benefit a portfolio, provided the results of those strategies have a low or no correlation with returns on the investor's existing allocations to broad asset class index products. The use of these "uncorrelated alpha" products has a further benefit, in that they avoid the situation (common in traditional actively managed funds) where an investor pays much higher fees to an active manager for performance that is, in fact, a mix of the index fund's results (often referred to as "beta") and the manager's skill (often referred to as "alpha").

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

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perspective, the best time to get back in is when an asset class is undervalued, even though this may be the most psychologically difficult time to do so. As a compromise approach, many investors choose to reinvest over time (i.e., “dollar cost average”) to limit potential regret.

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

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

The analyses we provide each month can be grouped into three major categories. First, we compare prevailing asset class prices to our estimate of fundamental values. Second, we present a number of analyses that are intended to warn of the development of conditions that raise the probability of sudden and substantial short-term changes in collective investor behavior. These include (a) Trends in rolling three month asset class returns that assess the probability of a High Uncertainty or High Inflation regime developing (which are dangerous since both of these are extreme disequilibrium conditions); (b) Trends in sector returns within asset classes that indicate the next turning points in the normal business cycle; (c) An

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assessment of the direction and intensity of recent price momentum (with accelerating positive momentum in the face of fundamental overvaluation the most dangerous condition); and (d) A measure of the estimated strength of investor networks and herding risk. Finally, we summarize our views with an estimate of the percent of time that markets will spend in each regime over the next three years, and the resulting expected real returns on different asset classes over this time horizon.

Table: Market Implied Regime Expectations and Three Year Return Forecast

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

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Rolling Three Month Returns in USD		30Jun10
High Uncertainty	***High Inflation***	***Normal Growth***
Short Maturity US Govt Bonds (SHY) **1.17%**	US Real Return Bonds (TIP) **4.00%**	US Equity (VTI) **-11.35%**
1 - 3 Year International Treasury Bonds (ISHG) **-5.61%**	Long Commodities (DJP) **-5.57%**	EAFE Equity (EFA) **-16.92%**
Equity Volatility (VIX) **96.36%**	Global Commercial Property (RWO) **-7.67%**	Emerging Equity (EEM) **-11.40%**
Gold (GLD) **11.68%**	Long Maturity Nominal Treasury Bonds (TLT)* **14.78%**	High Yield Bonds (HYG) **-1.73%**
Average ***25.90%*** ***Three Months Ago:*** ***(3.46%)***	***Average (with TLT short)*** ***-6.00%*** ***Three Months Ago:*** ***(.39%)***	***Average*** ***-10.35%*** ***Three Months Ago:*** ***2.64%***

* Falling returns on TLT indicate rising inflation expectations

As you can see, at the end of **June**, the conventional wisdom strongly favored the return to the high uncertainty regime that we have predicted for several months.

At the request of many readers, we now publish forecasts for real returns on different asset classes in USD. They can be compared to asset class return forecasts regularly produced by GMO, to which many of our readers also subscribe. Given our belief that foresight accuracy is improved by combining the outputs from different forecasting methodologies, we have taken a different approach from GMO. As we understand it (and their methodology is available on their site), they start with their estimate of current over or undervaluation, and assume that these will return to

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equilibrium over a seven-year business cycle. They believe that the use of this time horizon will cause a number of ups and downs caused by cyclical and investor behavior factors to average out. It has always struck us as a very logical approach, though one that (like ours) is based on unavoidably imperfect assumptions. The forecasting approach we have taken is grounded in our research in to the performance of different asset classes in three regimes, which we have termed high uncertainty, high inflation and normal times. In the latter regime, asset class returns are strongly attracted to their equilibrium levels – i.e., to the situation in which the returns supplied and the returns demanded are close to balance.

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

The final step in our methodology is to subjectively estimate the percentage of time that the financial system will spend in each of the three different regimes over the next 36 months. These estimated probabilities may or may not change each month, in line with our assessment of evolving political and economic conditions. We are the first to admit that ours is, at best, a noisy estimate of the returns investors are likely to receive on different asset classes over our target time horizon. We have no doubt that GMO would say the same about the results produced by their methodology. Indeed, it

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is either naive or misleading to say anything else, given that one is attempting to forecast results produced by a constantly evolving complex adaptive system. On the other hand, we also believe that our readers appreciate our willingness to put a clear, quantitative stake in the ground, so to speak. As always, we stress that research has shown that foresight accuracy can be improved by combining (i.e., using simple averaging) forecasts produced using different methodologies. With that admonition, our results are as follows:

Regime	**Normal Regime**	**High Uncertainty Regime**	**High Inflation Regime**	***Forecast Annual USD Real Return Over Next Three Years (weighted real return plus premium)***
Assumed Regime Probability Over Next 36 Months	*20%*	*45%*	*35%*	
Real Return Bond Yield	*3.5*	*2.5*	*1.5*	*2.4*
Asset Class Premia Over Real Rate (pct)				
Domestic Bonds	1.0	1.0	-3.0	*2.0*
Foreign Bonds	0.5	2.0	0.5	*3.5*
Domestic Property	3.0	-10.0	1.0	*(1.2)*
Foreign Property	3.0	-10.0	-1.5	*(2.1)*
Commodities	2.0	-6.0	3.0	*1.1*
Timber	2.0	-8.0	1.0	*(0.5)*
Domestic Equity	3.5	-12.0	-5.0	*(4.1)*
Foreign Equity	3.5	-12.0	-7.0	*(4.8)*
Emerging Equity	4.5	-15.0	1.0	*(3.2)*
Gold	-2.0	2.0	2.5	*3.7*
Volatility	-25.0	50.0	25.0	*28.6*

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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 **30 Jun 10**. We believe that asset prices reflect the interaction of three broad forces. The first is fundamental valuation, as reflected in the balance between the expected supply of and demand for returns. The Global Asset Class Valuation Analysis of each month's journal contains an extensive discussion of fundamental valuation issues. One of our core beliefs is that while asset prices are seldom equal to their respective fundamental values (because the system usually operates in disequilibrium), they are, in the medium and long-run strongly drawn towards that attractor.

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

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

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

The extent to which we believe over or underpricing to be the case is reflected in the confidence rating we assign to each conclusion. We believe it is extremely

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important for the recipient of any estimate or assessment to clearly understand the analyst's confidence in the conclusions he or she presents. How best to accomplish this has been the subject of an increasing amount of research (see, for example, "Communicating Uncertainty in Intelligence Analysis" by Steven Rieber; "Verbal Probability Expressions in National Intelligence Estimates" by Rachel Kesselman, "Verbal Uncertainty Expressions: Literature Review" by Marek Druzdzel, and "What Do Words of Estimative Probability Mean?" by Kristan Wheaton). We use a three level verbal scale to express our confidence level in our valuation conclusions. "Possible" represents a relatively low level of confidence (e.g., 25% – 33%, or a 1 in 4 to 1 in 3 chance of being right), "likely" a moderate level of confidence (e.g., 50%, or a 1 in 2 chance of being right), and "probable" a high level of confidence (e.g., 67% to 75%, or a 2 in 3 to 3 in 4 chance of being right). We do not use a quantitative scale, because we believe that would give a false sense of accuracy to judgments that are inherently approximate due to the noisy data and subjective assumptions upon which they are based.

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

The table also shows return momentum for different asset classes over the preceding three months, as well as the three months before that, to make it easier to

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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 30Jun10	***Current Price versus Long-Term Fundamental Valuation Estimate***	***Rolling 3 Month Return in Local Currency***	***Rolling 3 Month Return 3 Months Ago***
AUD Real Bonds	Neutral	3.55%	2.96%
AUD Bonds	Neutral	6.46%	-0.38%
AUD Property	Likely Undervalued	-4.75%	4.14%
AUD Equity	Neutral	-9.76%	-0.13%
CAD Real Bonds	Neutral	2.90%	0.49%
CAD Bonds	Neutral	3.23%	0.66%
CAD Property	Likely Undervalued	1.41%	3.88%
CAD Equity	Possibly Overvalued	-5.22%	3.40%
CHF Bonds	Likely Overvalued	3.70%	1.28%
CHF Property	Likely Overvalued	-2.48%	12.48%
CHF Equity	Neutral	-1.35%	5.56%

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Valuation at 30Jun10	***Current Price versus Long-Term Fundamental Valuation Estimate***	***Rolling 3 Month Return in Local Currency***	***Rolling 3 Month Return 3 Months Ago***
EUR Real Bonds	Neutral	-0.25%	1.57%
EUR Bonds	Possibly Overvalued	5.08%	3.05%
EUR Prop.	Neutral	-6.85%	8.20%
EUR Equity	Possibly Undervalued	-10.59%	1.58%
GBP Real Bonds	Possibly Overvalued	2.06%	2.07%
GBP Bonds	Neutral	4.65%	1.08%
GBP Property	Possibly Undervalued	-12.42%	-0.50%
GBP Equity	Probably Undervalued	-11.29%	5.59%
INR Bonds	Likely Overvalued	9.50%	-1.07%
INR Equity	Probably Overvalued	8.90%	-7.27%
JPY Real Bonds	Neutral	0.76%	0.40%
JPY Bonds	Possibly Overvalued	3.01%	-0.98%
JPY Property	Likely Undervalued	-6.57%	8.52%
JPY Equity	Probably Overvalued	-17.02%	7.56%
USD Real Bonds	Neutral	3.91%	0.36%
USD Bonds	Possibly Overvalued	4.33%	1.32%
USD Property	Neutral	1.24%	10.08%
USD Equity	Probably Overvalued	-11.32%	6.00%
Following in USD:			
Investment Grade Credit (CIU)	Possibly Overvalued	2.28%	2.03%
High Yield Credit (HYG)	Probably Overvalued	-1.70%	2.09%
Emerging Mkt Equity (EEM)	Probably Overvalued	-9.11%	2.47%
Commodities Long	Likely Overvalued	-5.57%	-5.68%
Gold	Likely Overvalued	11.68%	1.53%
Timber	Likely Undervalued	-7.57%	5.59%
Uncorrelated Alpha	N/A	-1.57%	1.06%
Volatility (VIX)	Neutral	96.36%	-9.66%
Future Return in Local Currency from holding USD:	***Based on Covered Interest Parity***		
Returns to AUD	Positive	8.31%	-2.06%

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Valuation at 30Jun10	*Current Price versus Long-Term Fundamental Valuation Estimate*	*Rolling 3 Month Return in Local Currency*	*Rolling 3 Month Return 3 Months Ago*
Investor			
Returns to CAD Investor	Neutral	4.84%	-3.33%
Returns to EUR Investor	Neutral	8.45%	5.69%
Returns to JPY Investor	Negative	-5.56%	0.37%
Returns to GBP Investor	Neutral	1.21%	6.07%
Returns to CHF Investor	Negative	2.31%	1.79%
Returns to INR Investor	Positive	3.59%	-3.65%

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 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

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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:

Jul	Aug	Sep	Oct	Nov	Dec09	Jan10	Feb10	Mar10	Apr10	May10	Jun10
0.51	0.51	0.56	(0.30)	0.72	0.24	(0.03)	0.30	0.46	0.44	(0.28)	0.28

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

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correlated change in prices across multiple asset classes) and back to a moderately ordered state by the end of April, and then to a less ordered, and therefore more resilient state at the end of last two months.

This Month's Letters to the Editor

Why do you prefer to use a mix of .70 Plum Creek Timber and .30 Rayonier to implement your allocation to timber, instead of the CUT ETF?

Qualitatively, we prefer PCL and RYN because they are timber REITs, which provide a more direct exposure to the return generating process for timber than is the case with CUT, which combines PCL and RYN with a significant number of equities in companies whose business is timber related. The reason Claymore introduced these equities into the index that underlies CUT was to make it more liquid, and thereby increase its appeal to institutional investors. However, this inclusion of equities diluted the exposure to the timber return generating process (which we describe at length in each month's Global Asset Class Valuation Analysis). A look at the quantitative data supports this view. Over the 31 months since CUT was launched in late 2007, here is how CUT, PCL, RYN, and a 70/30 PCL/RYN mix compare:

	CUT	PCL	RYN	.70PCL/.30RYN
Average Monthly Total Return	-0.25%	0.27%	1.31%	0.58%
Median Monthly Total Return	-0.05%	0.35%	0.57%	0.53%
Std Dev of Monthly Returns	12.11%	9.54%	10.44%	9.54%
Correlation with CUT	1.00	.76	.77	.78

As you can see, PCL and RYN have performed very differently from CUT over the past 31 months. We believe this is due to the mix of assets that comprise the CUT index. For this reason, we continue to prefer our PCL/RYN mix to CUT for implementing our model portfolios' allocation to timber as an asset class.

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What are my options if I read your Global Asset Class Valuation Analysis and discover that many asset classes are likely or probably overvalued?

The first step we suggest you take is to combine our analysis with other analyses that are based on different methodologies. Research has shown that simply averaging these forecasts has been shown to significantly improve accuracy, and thus should also improve your confidence in your valuation conclusions. Should they still point to likely or probable overvaluation of many asset classes, the following are your options: (1) reallocate away from overvalued asset classes that are above their target portfolio weights, and to asset classes that are underweight and undervalued. (2) Reallocate away from asset class that are overvalued and overweight to asset classes that are at their target weights but seem to be undervalued. (3) Sit tight if you have previously purchased insurance on the overweight asset classes that will protect you against a substantial fall in prices. Index put options are a good example of such insurance. However, if you haven't purchased such insurance while it was cheap, remember that it can be very expensive to purchase if lots of other people think an asset class may be dangerously overpriced. (4) Reduce your exposure to the overvalued asset classes by selling them and holding the proceeds in cash. We recognize that, for assets held in taxable accounts, the tax consequences of taking this step may be painful, and must be compared to the cost of alternative courses of action. That said, sometimes raising your allocation to cash is the best course of action.

Could you please clarify what you mean in your monthly Equity Valuation Analysis by "Low Demanded Return" and "High Demanded Return"?

Our valuation methodology is based on a comparison of the supply of returns an asset class is expected to produce and the returns investors will likely require to hold it in their portfolios. We believe the supply and demand for returns is seldom in balance; that is, financial markets usually operate in a state of disequilibrium rather than equilibrium (indeed, sometimes, as in the case of bubbles, they can operate far from

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equilibrium for an extended period of time). In the case of equities, the supply of real returns equals the current dividend yield (adjusted for buybacks) plus the real rate at which dividends are expected to grow in the future. The demand for returns equals the current yield on risk free real return bonds, plus a required risk premium. As reasonable people can and do disagree about the size of this premium, we use two values for it, a low one of 2.5% and a high one of 4.0%. Combining these with the current risk free rate gives us the "low demanded return" and "high demanded return" to which your question refers.

July 2010 Economic Update

As long-time readers know, in our assessments of economic conditions and their implications for strategic asset allocation and risk management, we use a methodology called "Analysis of Competing Hypotheses", or ACH. The essence of this approach is to identify alternative future economic scenarios, and then seek high value evidence that disconfirms them. We believe that this approach should produce superior insights, as it directly addresses the "confirmation bias" that affects human thinking, and too often blinds us to important changes underway in our environment. More specifically, the confirmation bias is our tendency to seek, notice, and give greater weight to evidence that confirms our existing views and mental models.

Our two current scenarios are based on traditional behavior patterns for complex social systems operating in far from equilibrium conditions. The first is enhanced cooperation and the second is higher levels of conflict. Realization of the cooperative scenario should result in a higher level of stability and predictability in the system's operations, while development of the conflict scenario will prolong and quite possibly worsen the system's instability. More detail about our two current scenarios is provided in the following table:

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	Cooperative Scenario	**Conflict Scenario**
Brief Scenario Description:	More rapid domestic consumption growth in China and cleantech investment demand in North America return the world to a healthy rate of growth, and enable preservation of the world trading system, a reduction in global imbalances, and monetary actions to head off an extended period of high inflation.	Domestic politics prevents an increase in cleantech investment in the United States, and China continues to pursue export led growth while encouraging rising nationalism to limit domestic unrest and the political threat to the current Chinese leadership. This only reinforces growing demands for protection in Europe and the United States. Weak global demand is maintained by rising fiscal deficits, which are increasingly monetized, leading to much higher inflation.
Key Agent Level Scenario Assumptions		
U.S. Middle Class	Resolution of banking crisis, passage of health care reforms, mortgage relief, and a sharp increase in cleantech driven investment spending lead to reduced uncertainty and a shift towards higher savings and lower consumption, without triggering populist demands for protectionism.	Continued economic stagnation, uncertainty, and insecurity lead to more extreme partisanship and the development of strong populist calls for protectionism and income redistribution.
Chinese Peasants	Land reform and economic growth (which provides jobs) boost	Growing unemployment and a sense that government stimulus is

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	Cooperative Scenario	**Conflict Scenario**
	incomes while a sharp increase in government spending on health care and education limits resentment of Communist Party corruption and economic inequality compared to coastal elites. This minimizes social unrest and threats to continued legitimacy of the Party's governance of China.	disproportionately benefiting coastal and party elites triggers widespread unrest and peasant alignment with disaffected students, urban unemployed, and members of the military. The Chinese government becomes aggressively nationalist in an attempt to channel this anger outward. At best, this triggers a global retreat into trading blocs; at worst, this strategy fails and China descends into fragmented authoritarian regions with minimal central control.
Iranian Youth	Prolonged economic stagnation and rising inflation lead to the removal of President Ahmadinejad and widespread pressure for better relations with the West. Economic self-interest trumps the Revolutionary Guards' ideological opposition to this opening. Moderation of Iran's conflicts with the west and a renewal of inward investment flows lead to increased hydrocarbon production, limiting upward pressure on global energy prices.	Supreme Leader Khamenei ensures that Ahmadinejad remains in power. Repression and emigration are used to limit resistance by younger Iranians to these policies. The country attempts to improve economic conditions via closer ties with China, while maintaining its nuclear program (which could trigger an attack by Israel) and a conflict-oriented policy versus the US that continues to put upward pressure on energy prices.
Key Issue Level Scenario Assumptions:		

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	Cooperative Scenario	Conflict Scenario
Overleveraged Consumers	Effective mortgage relief plans implemented in most affected countries, while stronger economic growth maintains income needed for debt repayment.	No effective mortgage relief legislation passed. Instead, rise in bankruptcies and mortgage foreclosures puts continuing downward pressure on housing prices.
Financial System Weakness	Combination of stronger investment and export led economic growth and effective bank rescue plans reduces uncertainty about health of system, and enables sufficient flow of credit to support renewed economic growth.	Worsening economic conditions and failure of bank rescue plans (due to design or political resistance) cause uncertainty to remain high, credit flows to be constrained, and defaults to increase, which all contribute to a worsening process of debt deflation.
International Imbalances	Rising domestic consumption spending in China enables a reduction in export dependence, while U.S. imports are reduced by a shift from private consumption to private saving and higher investment spending and greater exports. This reduces global current account imbalances to a manageable level.	China's continued emphasis on export led growth, at a time when the US is incurring high fiscal deficits (and eventually higher taxes) to maintain global demand, triggers demands for greater protection, which in turn precipitate a dollar exchange rate crisis as other countries move to limit the losses on their foreign exchange reserves. Result is a fragmentation of the global trade and financial system into much less integrated blocs.

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At some point, the accumulated evidence against one of our scenarios becomes so compelling that it triggers the development of two new scenarios that we hope capture a significant portion of the range of possible future outcomes for the economy and financial markets. Over the past six months, we have been going through this experience once again, as it became clear to us that global conditions has changed in important ways since our two current scenarios were developed. Here is how we see the situation today:

Key Factors

The leverage problem. The global debt problem now goes beyond the struggles of Anglozone households, the health of the world's largest banks, and the functioning of the fixed income securities and credit derivatives markets. Today it also includes the credit fueled property and infrastructure boom in China (and health of its visible and shadow banking systems), a range of corporate sector issues (e.g., solvency and rollover risk at large leveraged buyouts and some commercial properties, and increasing default risk at small and medium sized companies in the face of weak global demand), and rising concern with government credit risk around the world (e.g., the Eurozone, Japan, U.S. municipals, and even U.S. Treasuries). We have noted in the past that there are basically three ways to solve an excessive debt/income problem: (a) Growth – i.e., an increase in income; (b) Austerity – i.e., consume a smaller share of income, and devote more cashflow to debt reduction; and/or (c) Default – i.e., reduce the face value of debt, via exchange offers, debt-to-equity conversion, and/or bankruptcy (for more on the leverage problem, see *The Economist's* excellent special section on "Is There Life After Debt?" in its 24June2010 issue).

The demand problem. For the last ten years, we have used what we call the Economic Balance Equation to understand and assess aggregate demand conditions.

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This equation is based on the decomposition of aggregate demand that is taught in a first year macroeconomics class: Aggregate Demand [Y] equals the sum of Private Consumption [C] plus Private Investment [I] plus Government Consumption and Investment [G] plus product and service Exports [X] less Imports [M]. In this framework, Savings equals Aggregate Output [Y] less the portion of it that is consumed [C]. Extending the framework further, the sum of the Private Sector Balance [Savings Less Investment] plus the Public Sector Balance [Taxes less Government Consumption and Investment] always equals the External Balance [X minus M]. Dynamically, any change in one of these balances must be offset by a change in one or both of the others. For example, in many countries the global economic crisis has caused the private sector balance sharply increase (as households and companies spent less and saved more). By definition, there were only two ways to offset this: a decrease in the public sector balance (i.e., rising government deficits) and/or an improvement in the external balance (i.e., a reduction in the deficit or increase in the surplus, depending on the starting point). However, a change in the external balance of one country implies that one or more countries is willing and able to make equal and opposite changes in their own external, private and public sector balances (e.g., willing to accept a larger external deficit and larger private sector deficit). If this is not the case, then the external adjustment route will be closed off, and increased public sector deficits must bear the full burden of adjustment.

Finally, any Public, Private, or External Imbalance (essentially, a net positive or negative cash flow over a given period of time) also represents a change in financial either issued (in the case of a negative balance) or purchased (in the case of a positive balance). These stocks of claims accumulate over time, and, when they reach a critical threshold (e.g., our Debt/Income ratio) impose a constraint on the size of the negative balance that can be run by the Private, Public, and/or External Sector. This is the key feedback loop to the leverage problem. For example, the ability of the U.S. household sector to run a negative balance is hindered by its already high debt/income ratio, and by the fact that weak aggregate demand conditions have made the future path of the “income” term of this ratio – i.e., private sector income growth -- much more

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uncertain. In the public sector, Greece provides an example of how a country's ability to stimulate the economy through government deficit spending becomes sharply limited once a critical debt/income threshold has been exceeded. Finally, the emerging markets debt crises of the 1980s usually reflected a "sudden stop" to countries' ability to run external deficits once their external debt/export income ratio passed a tipping point. Similarly, in the years preceding the current global crisis, questions were repeatedly raised about other nations' continued willingness to accumulate U.S. dollar debt to finance U.S. external deficits whose size was unprecedented as a percentage of GDP.

The following table shows Deutsche Bank's projection for how different balances will evolve between 2009 and 2011. To better understand the aggregate demand problem, we have converted the change in these balances between 2009 and 2011 from a percentage of national GDP to a percentage of global GDP (using the most recent IMF estimates of 2010 purchasing power GDP).

2009 Balances as Pct of World GDP				
Country	Pct World 2010 GDP	Private Balance	Public Balance	External Balance
Australia	1.2%	-0.02%	-0.02%	-0.05%
Canada	1.8%	0.01%	-0.06%	-0.05%
Eurozone	14.8%	0.81%	-0.90%	-0.09%
Japan	5.9%	0.50%	-0.33%	0.17%
US	20.2%	1.47%	-2.06%	-0.58%
UK	3.0%	0.30%	-0.34%	-0.04%
India	5.2%	0.39%	-0.53%	-0.14%
China	13.3%	1.15%	-0.38%	0.77%
Rest of World	34.7%			-0.01%

This table highlights a number of key points about aggregate demand in 2009. First, it was heavily dependent upon deficit spending by governments, as evidenced by the negative public sector balances. Second, it also highlights the dependence of aggregate demand in China on the willingness of other countries, particularly the United States, to run government deficits (the U.S. ran an external deficit that largely offset China's external surplus). The next two tables describe Deutsche Bank's projection for how key balances will look in 2011, and the changes they will represent

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from 2009. Essentially, these tables paint one version of what the cooperative scenario could look like if it came to pass:

Forecast Change 2009 to 2011		*Expressed as Pct of World GDP*		
	Pct 2010 GDP	Private Balance	Public Balance	External Balance
Australia	1.2%	0.02%	-0.02%	0.00%
Canada	1.8%	-0.02%	0.03%	0.01%
Eurozone	14.8%	0.04%	0.06%	0.10%
Japan	5.9%	0.17%	-0.04%	0.13%
US	20.2%	-0.83%	0.79%	-0.04%
UK	3.0%	-0.16%	0.09%	-0.07%
India	5.2%	-0.10%	0.10%	-0.01%
China	13.3%	-0.50%	0.12%	-0.38%
Rest of World				-0.25%
Note: Anglo 4	26.2%	-0.99%	0.90%	-0.09%

In this table, negative changes on the private and public balances contribute to demand, as do positive changes on the external balance. As you can see, the key elements in the cooperative scenario include (1) an expansion of private sector demand in the United States and the rest of the Anglosphere (based on some combination of a recovery in household sector consumption and/or an increase in business investment spending); (2) a reduction in the U.S. public sector deficit; (3) a significant increase in private sector demand in China (logically via higher household consumption, as private sector investment spending is already extremely high); (4) a reduction in the size of China's external surplus; and (5) an increase in the rest of the world's external deficit. The end result of these changes is shown in the next table:

2011 Balances as Pct of World GDP				
Country	Pct World 2010 GDP	Private Balance	Public Balance	External Balance
Australia	1.2%	0.00%	-0.04%	-0.04%
Canada	1.8%	-0.01%	-0.03%	-0.04%
Eurozone	14.8%	0.86%	-0.84%	0.01%
Japan	5.9%	0.67%	-0.37%	0.30%
US	20.2%	0.64%	-1.27%	-0.62%
UK	3.0%	0.13%	-0.24%	-0.11%
India	5.2%	0.29%	-0.43%	-0.14%
China	13.3%	0.65%	-0.27%	0.38%
Rest of World	34.7%			-0.26%

The obvious issue is what happens if all these changes don't happen as expected. Suppose business investment doesn't increase in the United States? Suppose household spending doesn't increase in China? And suppose the Rest of

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the World doesn't accept a large change in their External Balance? What will support global aggregate demand in this case? Can governments increase their deficits by a sufficient amount given their already high current debt levels, and, in some cases (e.g., the U.S.) growing political resistance to deficit spending on a level that is unprecedented in peacetime? As you can see, it is very easy to envision a scenario in which global aggregate demand declines – the double dip recession that has been the subject of so much commentary over the past month. This brings us to the next critical issue.

The deflation/inflation problem. When households and businesses can no longer pay their debts, the collateral supporting those loans is usually seized and sold by lenders to limit their losses. When lots of loans go bad all at once, the resulting collateral sales place severe downward pressure on asset values, as we can see in the U.S. housing market today. Realization of loan losses also depletes banks' capital, causing them to be less able to make loans. At the same time, households and businesses become more reluctant to borrow and spend, as the outlook for demand, employment and income all become more negative. This often causes businesses to cut their prices in an attempt to generate sales and at least cover their variable operating costs and avoid bankruptcy. Eventually, falling asset values and prices for goods and services show up in government price indexes, and the existence of deflation becomes official. Once this happens, a profound psychological change can take place, as evidenced by the deflationary trap that Japan has been in for much of the past twenty years. As most debt contracts are not indexed to price level changes, debt service burdens can become heavier if wages and employment are cut, and income decline. Spending may also sharply decline, as households and businesses attempt to make up for declining incomes by postponing expenditures while prices decline and goods and services become steadily cheaper. In the context of the Economic Balance Equation, the result is a sharp rise in the private sector balance, which must be offset by either higher government deficit spending and/or an improvement of the external balance, via higher exports and lower imports. However,

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in a globalized world where economies are highly interconnected, there may not be other countries willing to accept offsetting changes to their external balance. This places the whole onus of breaking out of the deflation trap on domestic fiscal and monetary policy. At some point, private domestic and foreign investors may either cease or sharply curtail their purchases of government debt. This forces the government to print money to finance its deficits, which should eventually result in both higher inflation and a government debt crisis of some type – e.g., default and restructuring that occurs formally via negotiation or informally via prolonged inflation that reduces the real value of government debt held by private investors that is not indexed to inflation. Indeed, this is a pattern that has repeated throughout history, as Reinhart and Rogoff have shown in their outstanding book, This Time Is Different: Eight Centuries of Financial Folly. At some point, the combination of the leverage, demand, and inflation/deflation problems can trigger another issue:

The legitimacy problem. We view this issue at two different levels. The first is the belief by a given nation's citizens or subjects in the legitimacy of the global economic system – e.g., the current arrangements for the flow of goods and services, capital, labor and information across the borders of nation states. Our basic rule is that systems that lack adequate institutional mechanisms for balancing the interests of different parties, and especially winners and losers under the current arrangements, will eventually be regarded as illegitimate and forced to either put those institutions in place or retrench to a less integrated manner of operating. The second legitimacy issue concerns citizens' or subjects' view of the legitimacy of the institutional arrangements within their own nation. Throughout history, domestic legitimacy crises have been associated with populist political movements, major institutional changes, and in extreme cased, with varying degrees of civil unrest and violent regime change. In the United States, the middle class is the center of gravity for the legitimacy problem, which reflects not only the most recent crisis, but also the accumulated tensions created by many trends that preceded it (e.g., the widening income gaps between top earners and everyone else, the gap between public and private sector

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workers, the widening gap between the Wall Street-Washington elite and the rest of the nation, etc.).

In China, the situation is more complex. In addition to the rural peasantry, the evolving situation has also increased the importance of the views of urban workers (who are becoming more restive in their desire for a better standard of living), affluent middle class (who would be most damaged by the collapse of the current credit and property market bubble, and whose conspicuous consumption may rile urban workers) and the military (whose interests would be threatened by increasingly chaotic domestic conditions in China). Finally, the views of the German middle class are critical to the continued legitimacy of the Eurozone.

In addition to these four key problems, we also continue to believe that **three "wildcards"** could also dramatically affect whether the cooperative or conflict scenario develops in the future. The first is the evolution of future events in Iran. The second is the continuing evolution of the influenza virus, and whether H1N1 and/or H5N1 become capable of causing a large number of deaths around the world. The third wildcard is whether we have, as some assert, reached the peak of global oil supply. If this is the case, and if cost-competitive substitutes are not quickly commercialized (e.g., bio transportation fuels from algae or bacteria), any increase in the rate of global demand growth could be quickly choked off by a sharp rise in petroleum prices.

Where We Are and Where We're Headed

The four critical problems we have identified – leverage, demand, deflation and legitimacy – are not independent. In fact, a complex series of feedback loops flows between them, which suggests that future events will emerge in a manner that is both non-linear and hard to predict. That said, it is easy to find evidence that the cooperative scenario is not developing.

First and foremost, there are few signs of accelerating domestic demand growth in the three nations that have run the largest current account surpluses: China, Japan

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and Germany. The absence of increased domestic demand in these countries implies a continuation of relatively high (as a percentage of GDP) external deficits by the United States, undermining the benefits to the public sector balance that would otherwise be generated by any reduction in the size of the U.S. private sector surplus (i.e., by more business investment spending). GE CEO Jeff Immelt's recent observation about the growing difficulties faced by western firms doing business in China – "I am not sure that in the end they want any of us to win, or any of us to be successful" – cuts to what we see as the heart of the matter. China has a long horizon memory, and plays a long horizon game. Regarding the former, when Western nations held a strong advantage over China a century ago, they pressed it. We should not be surprised to be on the receiving end of such treatment when the shoe is on the other foot. Nor should we be surprised that China does not appear to be in any great rush to bail out the world economy, and nations, particularly the United States, that it sees as threats to its ascendant power. Their actions are quite consistent with the famous precepts of the great Chinese strategist Sun Tzu: win without fighting, and strike where the enemy is most vulnerable. In so far as China takes any actions to increase global demand, we believe it is and will be due to domestic political considerations – the need to maintain the economic growth and social order that are critical to the popular legitimacy, power, and survival of the Chinese Communist Party (particularly in the lead up to the 2012 leadership transition).

To be sure, China is facing a range of difficult domestic issues, including a credit and property bubble, the collapsing demand for its exports (e.g., due to the sharp Eurozone economic slowdown) and the unpredictable consequences of its one-child policy (e.g., increasing nationalism in a nation where young males outnumber young females, rising labor unrest and demands for higher wages, and the challenge of paying for a rapidly ageing population – the famous four grandparents, two parents, and one child dilemma). And it is not clear whether the West has more to fear from a China that continues on its current path, or a China that is beset by rising domestic crises and nationalist anger at foreigners for causing them. But for our purposes, neither outcome appears to be consistent with the development of our cooperative

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scenario. Moreover, we have seen precious little evidence of Western governments aggressively tackling the structural impediments to higher domestic economic growth rates (e.g., education reform, improved infrastructure, better control of spiraling health care costs, etc). Instead, we repeatedly see well-organized special interest groups (from environmentalists to the coal industry to teachers unions, etc.) blocking these initiatives. While Mancur Olson years ago predicted just this outcome (in his book, The Rise and Decline of Nations), we take no pleasure in his foresight, for it almost certainly implies more suffering and conflict than needs to be the case.

If the demand problem cannot be solved, then higher economic growth will not alleviate the leverage problem. In the United States, we do not believe that prolonged austerity is a viable alternative. Let's start with government deficits. The current political deadlock in many states over how to get their budget deficits under control provides an indication of just how hard it will be to implement prolonged austerity at the federal level (see "Public Rejects Variety of Options for Fixing State Budgets" published by Pew Research on 28June2010). At the household level, we believe that a number of factors work against the ability to sustain prolonged austerity. First, we have seen few signs of a resurgence in religion in the United States. In our view, prolonged austerity can only work when the people asked to experience it can place it in a larger moral framework – i.e., a classic creation-fall-redemption story that characterizes most major world religions. Second, we have not seen secular belief systems, like the environmental movement, gaining enough traction to offset the decline in traditional religion. Given this lack of moral context for rejecting conspicuous consumption – and feeling good about doing so -- and the continued widening of income differences in the United States (which stimulates "keep up with the Joneses" consumption desires), we conclude that prolonged austerity is unlikely to be a viable path for the nation to follow. That makes some type of default – formally via restructuring and bankruptcy, and/or informally via a period of prolonged high inflation – as end result of the path we are on.

Granted, this will not happen right away. Time and again, we have been surprised at the ability of complex adaptive systems, even under great pressure, to resist tipping over into the region of chaotic operations. But unless something

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fundamental changes, we believe this is where we will eventually end up. In the future, we expect to see accelerating strategic mortgage defaults, bankruptcy filings, and credit system crises around the world. Indeed, this is already happening. For example, the *Wall Street Journal* recently noted that all the reduction in U.S. household debt/income ratio that has occurred since the first quarter of 2008 has been due to defaults, and not higher savings -- i.e., more austerity ("Number of the Week: Default, Not Thrift, Pares U.S. Debt", 12June2010). Another recent report found that "nearly one in five mortgage defaults are strategic" (see the article with this title in the 28June2010 *Wall Street Journal*). The good news is that, as has been the case throughout history, extinguishing debt will lay the groundwork for renewed growth. The bad news is that we will have to experience a lot of pain to get to this point.

Unfortunately, the sequence of events described above also seems consistent with a growing threat of deflation and a Japan-style extended period of economic stagnation that should eventually culminate in the aggressive monetization of government debt, and a sharp increase in inflation that will only be reduced when the excessive leverage problem has been resolved. While Ben Bernanke, when he was a professor, was one of the world's leading experts on deflation, the fact remains that we have far less policy experience with successfully avoiding and reversing deflation than we do with avoiding and reversing deflation. Unfortunately, it looks like we are going to close that experience gap.

In our minds, the greatest uncertainty surrounds the question of how these economic developments will affect legitimacy, and the unpredictable results that could follow. The forecast in which we have the greatest confidence is that, as has repeatedly happened throughout history, the current highly open and integrated global economic system will not survive the crises that lie ahead. We remain convinced that we will see a return to a "bloc-based" system, organized around three competing centers of gravity: the Anglosphere, Continental Europe, and the Sinosphere. Interestingly, we believe that the UK in particular would strongly benefit from this development, as it would reduce uncertainties about how it will address its leverage problem. We also strongly suspect that India and Japan will choose to align

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themselves with the Anglosphere in this system. For example, a recently published study by the Pew Global Attitudes Project compared different nations' views of China. In the United States, 36% had an unfavorable view of China, while 49% had a favorable view. In India, this ratio was 52% unfavorable, 34% favorable; in Japan it was 69% unfavorable, 26% favorable. Similarly, people in different countries were asked if they viewed China as a partner, an enemy, neither or "don't know." In the United States, the partner/enemy split was 25%/17%; in Japan, it was 32%/20%; and in India it was 32%/44%. Interestingly, in the case of Russia, the results were very much in the other direction, with a 29%/60% unfavorable/favorable split, and a 49%/13% partner/enemy split.

We are far less sure of how the economic consequences of the conflict scenario will affect the perceived legitimacy of domestic institutions and leaders. On the one hand, the headlines suggest trouble ahead, from declining support in Germany for the Eurozone, to Rasmussen Reports' recent finding that "68% say the political class doesn't care what most Americans think" (Rasmussen 15Jul10), to worries that weakening economic growth, and eventually the collapse of the credit/property bubble, will cause splits among the Chinese elite (for example, see "Will the Chinese Communist Party Survive the Crisis?" by Minxin Pei, published in the March 2009 issue of *Foreign Affairs*) and or a spike in frustration among the upwardly mobile Chinese middle class (see The Myth of the Social Volcano by Martin King Whyte). On the other hand, unwinding the Eurozone would be an extremely difficult undertaking, and, in the case of China, many other nations have shown how maintaining the loyalty of the security forces, along with the leverage provided by modern surveillance technology, can enable regimes to remain in power long after they have lost any popular legitimacy.

In the case of legitimacy issues in the United States, a recent article in *National Affairs* made some important points. In "Populism, American Style", Henry Olsen begins by noting that, "although classical populism has varied according to time and place, it has generally taken the form of a morality play in four acts. In the first act, the masses come to feel like powerless victims, left helpless against the onslaught of an

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oppressive 'other.' In the second act, often following a crisis, that 'other' is defined by a popular leader as an implacable enemy – one who has no concern for the welfare of the people, and whose actions are motivated by selfishness and greed. In the third act, the leader proposes a solution: The people must use their numerical advantage to seize control of the state. In the fourth and final act, that power is used to take back from the enemy that which rightfully belongs to the people, without regard for the enemy's consent or rights."

However, he goes on to note that the history of populism in the United States has been different: "First, successful populist movements tend to characterize the American people not as helpless victims, but as honest folk dispossessed of their right to achieve prosperity and happiness through self-improvement and hard work. As such, American populists seek not a charismatic leader who will bring them order and justice, but rather a re-opening of the avenues to self-advancement and self-reliance. Second, the 'other' in American populism tends not to be vilified as an implacable enemy without rights. Instead, he is an adversary: one who might be corrupt or acting unjustly at the moment, but still a fellow citizen who retains his basic American goodness, is capable of redemption, and is secure in his rights. Third and most important, effective American populists generally do not seek to take the enemy's property to redistribute it to the people. Instead, they argue that if the government is once again made responsive to the electorate – by placing the populists in power – the people will again be able to help themselves. Sooner or later, the populists usually develop a policy agenda – and it is typically a case for using government to advance self-reliance or enable prosperity and growth. These distinctive elements of American populism recur throughout our political history."

Last but not least, when it comes to the wildcards, we observe that relations between Iran and the rest of the world have significantly deteriorated over the last three months, and that military action now seems to be more probable than it was while the Obama administration was attempting to achieve a diplomatic re-engagement with the Ahmadinejad regime (e.g., see "Iran Could Spring a Nasty Surprise" by Simon Tisdall in the 15July10 *Guardian*, and Joe Klein's "An Attack on

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Iran: Back on the Table" in the 15July10 *Time*). As we have noted in the past, open hostilities with Iran would likely lead to a spike in global oil prices, which could easily tip the world economy into a new recession. On the oil supply front, any increase in global economic demand will soon run up against the fact that oil reserves that are recoverable at today's prices are limited (see, for example, "The Status Of Conventional World Oil Reserves—Hype Or Cause For Concern?" by Owen, Inderwildi, and King). The result will be sharply increasing energy prices that, in the absence of new energy breakthroughs, will limit the effective rate at which global demand can grow. The wildcard aspect of this that we do not believe that world financial markets have fully priced in the implications of this constraint. The final wildcard is the continuing evolution of the H1N1 and H5N1 influenza viruses, even though much of the media apparently considers this story over. Unfortunately, the evolution taking place appears to be headed in more dangerous direction that is making H1N1 more deadly, as can be seen in the early evidence from this year's southern hemisphere flu season. Again, the potential exists for this to turn into a nasty economic shock this autumn and winter, when influenza season peaks in the northern hemisphere.

Let us conclude with a review of what our outlook implies for strategic asset allocation and risk management. At the regime, level, as we have repeatedly noted in recent months, we believe that markets have been underestimating the probability of a return to the high uncertainty regime, as well as how long that regime may last. In terms of global currencies, given the stresses on the Eurozone and Japan, it seems likely that higher uncertainty will result in a strong inflow of assets into the U.S. Dollar, and, to a lesser extent, the Swiss Franc and Canadian Dollar. While this will be good news when it comes to financing high U.S. government budget deficits, it will not be good news for the U.S. Dollar exchange rate (which could sharply appreciate), export growth, and employment. As such, this inflow into the USD will put further pressure on China to increase domestic household consumption demand, and, if this is not forthcoming, accelerate the reversal of globalization and transition to a world of competing blocs.

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Rising uncertainty should also lead to rising prices (and falling yields) on Canadian government bonds, German Bunds (government bonds), and perhaps Scandinavian governments too, though for USD-based investors gains on the last two will to some extent be offset by exchange rate losses. In contrast, the exchange rate gains on the USD/CAD could well be positive. Within the government bond sector, real return bonds will benefit to some extent from further declines in real interest rates; however demand for them as an inflation hedge will wane, at least for now. On the other hand, demand for longer maturity governments should increase, as fixed income markets become more convinced that we must proceed through a period of deflation before high inflation can occur. In credit markets, we expect to see prices for lower rated instruments fall as perceived default risk increases. On the other hand, prices for issues with superior credit risk characteristics should increase. Higher uncertainty should also generate rising interest in commercial property investments, particularly in those regions (e.g., the Eurozone) where this asset class has been a traditional refuge in times of trouble when capital preservation is paramount. In the United States, commercial property could benefit from an inflow of capital; possibly offsetting this, however, will be the negative impact from rising commercial mortgage backed securities and collateralized loan obligation defaults (see Pimco's new report on its "U.S. Commercial Real Estate Project").

Worries about preserving the real value of capital could also lead to an increase in the price of other vehicles for gaining direct exposure to real assets, such as timber and oil and gas funds, particularly those that offer a regular income component and are based in politically safe regions (e.g., Canada, the U.S., Australia, Germany, the U.K., Scandanavia, etc.). On the other hand, we expect futures-based, long-only commodity index products to suffer, as declining economic growth reduces demand for the underlying products (i.e., causing more downside spot price surprises), while the structural imbalance between futures buyers and futures sellers continues to cause many futures curves to be contangoed, and consequently roll yields to be negative. On the other hand, investments in futures-based volatility funds should benefit from rising uncertainty. The outlook for gold funds is more mixed. Gold prices should benefit from

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rising uncertainty in the Eurozone and China; however, the most important upward price pressure would come if and when investors lost confidence in U.S. government securities as the most liquid and secure refuge in times of trouble. It seems to us that this loss of confidence is inevitable, and will arrive when investor demand falls and aggressive monetization of the debt begins, and the probability of much higher inflation sharply increases. However, we are much less certain about the timing of these developments.

Finally, our expectations for the future do not bode well for equity markets. There are, however, some possible exceptions to this, including stocks of large, well-managed and conservatively capitalized companies that can both absorb shocks and benefit from them by exploiting consolidation opportunities, and, perhaps, selected emerging markets like India and Brazil. On balance, however, we believe that the world's equity markets face a high risk of a "lost decade." Finally, we believe that the implications of our outlook for uncorrelated alpha strategies are mixed. The spike in uncertainty should work to the benefit of the best global macro managers, though set against that may be increased restrictions on their ability to easily redeploy capital between different nations' financial markets. Equity Market Neutral should continue to be a viable strategy, so long as managers are careful to hedge out their directional market exposure. Currency strategies may fair less well, as they become more of a one-way bet (i.e., hold the USD) and the ability to move capital between markets becomes subject to more constraints. Arbitrage strategies may suffer as historical relationships between asset returns are undermined by rapidly evolving political and economic changes. Finally, equity long/short strategies typically have a net long exposure, so their returns should be hurt by substantial equity market declines.

Let us conclude with a word of caution. We face a world in which the term "unprecedented" has become commonplace. In our view, this leads to three imperatives for investment managers and their clients. The first is the need to move away from relative performance goals, and to replace them with a clear view of the real rate of return that must be earned in order to achieve one's long-term financial goals. In a highly uncertain world, relative performance will increasingly be driven by

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chance and accident. In relatively calm periods, this has always been a very difficult game even for the most skilled to win consistently; in the coming years, it will become even more difficult, and getting the big question – asset allocation – right is likely to be even more important. The second imperative is the heightened need to employ forecasts based on different methodologies, and to combine them to improve the accuracy of one's views in the face of high uncertainty. We have no monopoly on insight; the smartest thing our readers can do is combine our forecasts with those produced by other organizations. The third imperative is to focus on becoming more agile and adaptive as the necessary complement to a decline in expected forecast accuracy during a period of high uncertainty. In practice, this means paying even more attention to avoiding over-optimism, overconfidence, the confirmation bias, and the all-too-human tendency to avoid facing up to decisions that aren't working out and quickly cutting one's losses. We strongly agree with Seth Klarman, when he says, "we are big fans of fear, and in investing it is better to be scared than sorry."

Feature Article: Understanding and Predicting Uncertainty Shocks, Part 2

Last month's feature article explored the nature and importance of a topic that is frequently in the headlines today: Changing perceptions of the degree of uncertainty that prevails in the global economy and financial markets. This month we analyze the causes of these changes in perceived uncertainty, and the extent to which they may be predictable. We conclude with the implications of our analysis of uncertainty shifts for asset allocation and risk management.

Changes in perceived uncertainty are rooted in both individual and collective/network factors, and can be both endogenous (internal) and exogenous (external) to the system in question. Let's look at each of these in turn. At the individual level, for many years we have organized our thinking about investor behavior using the following model:

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1. An individual attends external/environmental stimuli on two levels. The first is conscious, and driven by his or her mental model of a situation, which includes accurate perception of its key element, understanding of their meaning and significance, and forecasts for how events are likely to evolve in the near-term in response to possible actions. These are often referred to as the three levels of situational awareness. The second aspect of an individual's attention to his or her environment is subconscious, and driven by factors that helped ensure our remote ancestors' survival in the harsh conditions of the East African plain. This directs attention to social cues, particularly indications of fear in others, signs of actual danger, large or rapid changes in the surrounding environment that could represent a potential threat, stimuli that are novel and/or vivid, and possible sources of immediate reward and satisfaction of basic needs.
2. Stimuli are consciously evaluated using our cognitive capabilities.
3. This cognitive evaluation either dampens or reinforces our initial emotional evaluation of the stimuli.
4. On the basis of our thoughts and feelings, we first search our repertoire of remembered actions to see if one or more can be used to achieve our goals in the current situation. These goals are both conscious/cognitive and often unconscious/emotional. The latter group includes avoiding loss of resources and/or relative social standing, reducing uncertainty, and avoiding social isolation. If an available course of action does not appear to have a sufficiently high probability of achieving our goals, we have to take more time to consciously develop an action plan, mentally simulate its likely results, and decide whether its likelihood of success is high enough to proceed; if it does not, we repeat the process, if time is available. If it isn't, we execute the available course of action with the highest likelihood of success.
5. We take action.
6. Random factors (i.e., good and bad luck) affect the outcome of our action.
7. Our action combines with the actions of others in sometimes unpredictable ways to generate aggregate outcomes that we observe.

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8. Depending on how those outcomes compare to our goals and expectations, we either repeat the process or shift out attention to higher priority stimuli.

Let us look at these in more detail, with an eye towards better understanding how they can be a source of a sharp increase in our perception of uncertainty. In terms of the allocation of scarce attention, we believe that the ability of humans to detect fear in others, even in the absence of verbal communication, is a critical source of a heightened sense of uncertainty. Moreover, this has become a much more powerful channel in an age of increased urbanization, low cost global communication (of not just text, but also real time audio and video), and hyper connectivity (e.g., count how many more ways you are connected to other people today than you were ten years ago). Another factor which has primed us for uncertainty spikes may also be the tendency, in an age of information overload, for senders of messages to make their communications more vivid and emotionally charged, in an attempt to attract the attention of their target audience (think, for example, of how life insurance or health care advertising often seeks to play on our fears). In other words, if you assume that as human beings we have a limited emotional capacity to cope with uncertainty, technological changes may have resulted in more of this capacity being used up on a daily basis than was the case in the past, and as a society we may therefore be operating closer to the "uncertainty spike" threshold. Rising sales of anxiety management drugs over the past twenty years seems to further support this view.

The normal functioning of our cognitive processes can also lead to sharp increases in perceived uncertainty. As many analysts have noted, we initially establish our mental models on the basis of relatively little information (e.g., deductively from available concepts, or inductively from available experience). However, once established, our mental models control the way we attend to and weight subsequent information, and update our prior views. In particular, three common phenomena can easily lead to surprise, and a sudden increase in perceived uncertainty. First, we naturally tend to be over-optimistic – e.g., to overestimate the average (mean) return on an asset class over the next ten years. While some researchers pejoratively call

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this tendency a bias, other researchers have shown how over-optimism can confer evolutionary advantages (see, "On the Evolutionary Emergence of Optimism" by Heifetz and Spiegel). Second, we naturally tend to be over-confident – that is, to underestimate the range of possible future outcomes around the mean or most likely outcome. In "Overconfidence is a Social Signaling Bias", Burks, Carpenter and their colleagues show how "overconfidence is induced by the desire to send positive signals to others about one's skill", and how "sending overconfident signals, irrespective of ability, could be socially beneficial to the sender."

Similar conclusions are reached by Radzevick and Moore in their paper, "Competing to Be Certain (But Wrong): Social Pressure and Overprecision in Judgment." They study the impact of financial advisor confidence, and note how competition with other advisors for clients' business leads to advisors becoming more overconfident. Along those same lines, Price and Stone find that overconfident advisors are rated as more accurate, even if they aren't ("Intuitive Evaluation of Likelihood Judgment Producers"). Finally, we tend to give more attention and weight to information which confirms our existing mental model, rather than information which disconfirms it. Some researchers believe that this is a logical outcome of our desire to conserve scarce cognitive processing capacity (see "From Perception to Action: An Economic Model of Brain Processes" by Brocas and Carrillo). Interestingly, in the context of investments, Ko and Huang find that when an investment we own has lost money, we are particularly likely to interpret new information in a positive manner. This confirmation bias was much stronger than when we receive new information about a stock which has recently experienced a gain. They conclude that investor beliefs are more persistent when they are losing money, which is consistent with other studies which find that momentum effects are driving more by loser than by winner stocks (see "Persistence of Beliefs in an Investment Experiment"). In our view, this study highlights the complex interaction between our cognitive processing (e.g., the confirmation bias) and our emotional processing (our desire to avoid absolute or relative losses). Other researchers have attributed the confirmation bias to our psychological need to maintain coherence of our mental models, including our

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representations of concepts, beliefs, goals and actions. Again, one can also interpret this as an emotional desire to avoid loss – in this case, loss of the certainty and security provided by a coherent model (for more on this, see Paul Thagard's book, Coherence in Thought and Action). In practice, these biases set the stage for surprise, as they enable the development of an increasingly larger gap between our mental model/situation awareness and reality. When accumulated evidence finally forces an investor to recognize that his or her mental model needs to be substantially revised, the normal result is a sharp increase in uncertainty and fear as situation awareness is lost.

We like to use the following matrix to describe the range of reactions we have encountered in both individuals and organizations over the years:

Degree of Perceived Uncertainty

Goal Achievement?		
	Moderate Uncertainty: I'm achieving my goals, but I no longer think I understand the situation	Minimum Uncertainty: I'm achieving my goals and I understand the situation I face
	Maximum Uncertainty: I'm falling short of my goals and I no longer understand the situation I face	Low Uncertainty: I'm falling short of my goals, but I understand the situation and know what I have to change

Situation Awareness?

Let us now move from endogenous individual to endogenous collective sources of sharp increases in uncertainty. Social networks are central to our identity as human beings, and our evolutionary progress over the ages (see, for example, "Humans: Why They Triumphed" by Matt Ridley in the 22May2010 *Wall Street Journal*). However, it is only recently that researchers have realized the importance of social networks to understanding economics and finance (see, for example, "Overview of Social Networks and Economic Applications" by Matthew Jackson, and the many works of

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Didier Sornette on this subject). In the economic context, perhaps the most studied networks are those termed "scale free", which means that their distribution of the number of connections between a given node and other nodes follows a power law. Many human networks have this property, being characterized by a relatively small number of very highly connected individuals, and a much larger number of individuals with a far smaller number of connections to other people (i.e., to other network nodes). Other researchers have shown that when individual behavior is influenced to a degree between zero and 100% by inputs from others in a scale free network, it produces fluctuations in growth that have very similar power law distribution across a wide range of phenomena, from GDP growth rates to the size distribution of U.S. firms to money invested in mutual funds (see "The Cause of Universality in Growth Fluctuations" by Schwarzkopf, Axtell and Farmer). This means that the production of a very small number of large changes is inherent in the structure and operation of the scale free network and its influence on individual decisions.

In an investment context, agent-based modeling of networks of traders employing different strategies (e.g., fundamental value and trend-following), has shown the interaction between traders (comparing their performance to others, and modifying their existing strategy when it fails to produce satisfactory results) produces a preference for trend-following and other technical strategies, despite their tendency to sometimes generate substantial booms and busts (see "A Prisoner's Dilemma Causes Technical Trading" by Joshi, Parker, and Bedau). This process also tends to produce the "crowded trades" and rising correlations that were observed in the run-up to the most recent financial crisis. It should also be noted that the use of leverage accentuates both the size of the bubbles and the ferocity of the crashes that can result from these dynamics (e.g., see "Leverage Causes Fat Tails and Clustered Volatility" by Thurner, Farmer, and Geanakoplos). These factors are also the basis for two other papers that highlight how network connections lie at the root of contagion and systemic risk in the world financial system (see "Contagion in Financial Networks" by Gain and Kapadia and "Systemic Risk in a Unifying Framework for Cascading Processes on Networks" by Lorenz, Battiston, and Schweitzer).

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In a different, but equally important context, Niall Ferguson has shown how complex network relationships can also help to explain the sudden collapse of political systems (see "Complexity and Collapse: Empires on the Edge of Chaos"). And in "Inductive Game Theory and the Dynamics of Animal Conflict", DeDeo, Krakauer, and Flack concluded that networks were at the heart of conflict. They conclude that individuals "base their decision to fight on memory of social factors, not on short timescale resource competition. Furthermore, the social assessments on which these decisions are based are triadic (self in relation to two other individuals), not pairwise. This triadic decision making can cause long conflict cascades that generate a high cost." They conclude that "individual agency has been over-emphasized in the social evolution of complex networks, and that pairwise theories are inadequate."

In the corporate world, many analysts have noted the unintended side effects of the process re-engineering undertaken by so many companies in the 1990s. While seeking to improve efficiency (and profits) by making existing processes more efficient, they eliminated the excess (or "slack") resources that enabled companies to absorb and recover from unexpected shocks. In this manner, the pursuit of highly efficient and stable operations, sometimes reinforced by the use of high leverage (which was often called a "more efficient capital structure"), created a false sense of corporate strength, as these same moves made organizations much less robust in the face of uncertainty. Moreover, as we are now learning, the creation of larger and more interconnected global supply chain networks in the name of efficiency has also exposed many companies to new sources of uncertainty and external shocks (e.g., loss of intellectual property, loss of core capabilities, and heightened exposure to political risk and disruptions caused by the failure of critical nodes, etc.).

Other researchers have found that the way connections are formed between network nodes affects the rate of diffusion and learning among different groups within a scale free network. For example, when people prefer to form connections with people who are similar to themselves, the rate of learning in a network is slowed (see "How Homophily Affects Diffusion and Learning in Networks" by Golub and Jackson). Again, differential learning rates across groups can cause large surprises for some. In

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addition to the way social networks can influence the diffusion of information, speed of learning, and cognitive decisions, they can also influence individuals' emotions. For example, envy can be interpreted as fear that one's relative social standard has been diminished due to another's gain. Like all fears, envy is easily conveyed through social networks, and triggers a heightened fear of social isolation, or, viewed differently, a stronger impulse to stay with the group. Similarly, a sudden market crash will also trigger fear, both directly and via the heightened uncertainty it likely creates for many investors. And again, this fear is easily transmitted across a social network, which in turn raises affected individuals' desire to stay with the group for security. As previously noted, these responses are all easily seen as mechanisms that enhanced our ancestors' survival prospects on the East African plain. For investors, however, the self-reinforcing nature of collective emotions can easily lead to heightened feelings of uncertainty.

Thus far, we have shown how, at both the individual and collective level, sudden increases in uncertainty are endogenous (i.e., wired into) the operation of our processes and systems. It goes without saying that more traditional exogenous factors (e.g., a technological change or major hurricane) can also cause sudden spikes in uncertainty. However, in our view these spikes are more likely to be transitory than the uncertainty shocks that result from the operation of the system itself, which most people find much harder to understand. The "flash crash" on 6 May 2010 provides an excellent recent example of this phenomenon. A relatively normal trade, undertaken when a variety of trading algorithms (i.e., quantitative strategies) had apparently concluded the U.S. equity market was at a critical point, caused an unprecedented intra-day fall in the value of the Dow Jones Index. Yet commentators, government and market officials have yet to provide a clear explanation of just how this "mini-crash" occurred. As such, the rise in uncertainty it caused is likely to still exist for many investors.

The next question to ask is the extent to which sharp increases in uncertainty can be predicted in advance. Since we are operating in the realm of Lo and Mueller's Level-4 uncertainty, quantitative modeling alone is unlikely to provide a satisfactory

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forecast -- some degree of qualitative analysis is also needed to generate insight. We believe that the key to such an approach lies in an appreciation of two concepts. The first is the three levels of situation awareness: (1) perception of the key elements in a situation; (2) comprehension of their meaning; and (3) projection of how they are likely to evolve in the short-term. The second is John Maynard Keynes' "beat the gun" analogy, where the object of a game is to most accurately predict the future behavior of other investors.

We believe that he likelihood of a person experiencing a strong surprise, and spike in perceived/felt uncertainty, is directly related to how he or she perceives his or her level of situation awareness. More specifically, we believe that uncertainty increases non-linearly as one perceives failures at successive levels of situation awareness (or, viewed another way, perceives successively more serious shortcomings in one's mental model). At the third (highest) level of situation awareness, failure to accurately project how a situation will evolve usually doesn't sharply increase uncertainty because people realize that a certainty degree of forecast inaccuracy is inevitable and inescapable.

More upsetting is failure at the second level of situation awareness: to comprehend, and be able to explain, the current meaning of the key elements one perceives. For example, in light of the 6 May 2010 "flash crash", do you think people have become more uncertain about what causes stock prices to change, sometimes by very large amounts in a single day? What is the relative importance of changes in fundamental value, changes in perceptions of future investors behavior, or the actions of computer trading programs that employ extremely complex and high volume strategies?

The most unsettling circumstance, which is almost guaranteed to spike the feeling of uncertainty, is when a person realizes that a failure of Level 1 situation awareness has occurred – that they haven't been paying attention to factors or issues that are critical to the achievement of an important goal (say, financial security, or earning this year's performance bonus). Put differently, when you realize you haven't even been paying attention to the right signals, never mind being able to explain their

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meaning or use them to predict the future, you know you are in trouble. If there is any doubt about that, think about people's reaction when they are shocked to learn that they are getting fired, or their spouse wants a divorce. Under these circumstances, how many times have you heard, "I didn't even see it coming? How could I have been so clueless and not seen the signs?" And how long does it take for a person who has gone through one (or both) of these experiences to once again trust his or her judgment about job or relationship security – to reestablish a mental model and level of situation awareness that they trust?

The Keynesian/"beat the gun" aspect of uncertainty spikes is that, when it comes to predicting shifts to the High Uncertainty Regime, what counts is an accurate forecast of when investors who have the greatest impact on prices will discover their situation awareness is seriously deficient. In today's market, those investors – the market's "center of gravity" if you will -- are not easy to identify. Is it the algorithmic traders, and their high frequency trading programs? Or do these players simply magnify the impact of human investors' increased uncertainty? Is it the hedge fund community? Or are they generally savvy enough to exploit these uncertainty spikes? Is it institutions like endowments and pensions? Or are their time horizons so long term that they are less affected by uncertainty spikes? Or does the center of market gravity lie with relatively affluent individuals who account for the bulk of mutual fund holdings, as well as a disproportionate share of private consumption spending?

Once "center of gravity" investors have been identified, the process of exploiting uncertainty forecasts is the same one that value investors routinely follow: Do I have a view (i.e., a variant perception) that significantly differs from the target group's conventional wisdom? If so, what asset class prices will be affected when these views are reconciled? And what catalyst(s) will bring this reconciliation about, over what time frame?

On the quantitative front, researchers have found that some early warning indicators of major regime changes may exist, apart from changes in the VIX and other market volatility indicators that are commonly monitored by investors (and which tend to be more coincident rather than leading indicators of uncertainty spikes). In "Early-

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Warning Signals for Critical Transitions", Scheffer, Bascompte, Brock and their fellow authors concluded that "complex dynamical systems, ranging from ecosystems to financial markets and the climate, can have tipping points at which a sudden shift to a contrasting dynamical regime may occur. Although predicting such critical points before they are reached is extremely difficult, work in different scientific fields is now suggesting the existence of generic early-warning signals that may indicate for a wide class of systems if a critical threshold is approaching."

The authors highlight two potential indicators. "The most important clues that have been suggested as indicators of whether a system is getting close to a critical threshold are related to a phenomenon known in dynamical systems theory as 'critical slowing down'…As the system approaches a critical point, it becomes increasingly slow in recovering from small perturbations…Analysis of various models show that such slowing down typically starts far from the critical point, and that recovery rates decrease smoothly to zero as the critical point is approached and reached…One important prediction is that the slowing down should lead to an increase in the autocorrelation in the resulting pattern of fluctuations; because slowing down causes the intrinsic rate of change in the system to decrease, the state of the system at any given moment becomes more like its past state." In this regard, one particularly worrying indicator has been the progressive slowing down of the rate at which employment has recovered from recent U.S. recessions (80-82, 90-91, 01-02, and 07 to today). While financial market prices have responded more rapidly, post-downturn employment recovery seems to be a much better indicator of the fundamental health of the political-economic system. And for almost 30 years, it has been sending increasingly worrying signals.

The second indicator of an approaching critical point highlighted by the authors is increasing skewness (i.e., the asymmetry of fluctuations). "This does not result from critical slowing down. Instead, the explanation is that at the critical point, the unstable equilibrium that marks the border of the basin of attraction [for the new regime] approaches from one side…As a result, the system will tend to stay in the vicinity of the unstable point for longer than it would on the opposite side of the stable

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equilibrium." Two other researchers, Guttal and Jayaprakash, have also recently found that "changes in the asymmetry of the distribution of time series data, quantified by changing skewness, is a model-independent and reliable early warning signal for regime shifts caused by both increased external fluctuations or decreased internal resiliency" (see "Changing Skewness: An Early Warning Signal of Regime Shifts in Ecosystems").

While these indicators promise to be helpful in forecasting regime shifts and spikes in uncertainty, the fact remains that such predictions are currently extremely difficult to make with a degree of accuracy significantly beyond luck. The inescapable conclusion is that the key to superior investment performance is therefore superior adaptability rather than superior forecasting skill. This is also the conclusion of a very interesting new book by David Alberts (The Agility Imperative), that will soon be published by the Command and Control Research Program of the U.S. Department of Defense. Alberts opens with a provocative statement: "We are still thinking and acting as if we are in the Information Age. However, this label no longer provides an accurate description of the characteristics of our time. More importantly, Information Age mindsets and solutions cannot adequately address the challenges of the 21st century. A more appropriate label for the world we live in is The Age of Interactions. The technologies of the Information Age and the application of these technologies have, since the arrival of ubiquitous connectivity, evolved from providing limited access information processing applications to enabling an explosion of rich [network] interactions…The Information Age has provided us with increased access to vast amounts of data…It has held out the promise of reducing uncertainty to manageable levels and consequently improving our ability to make decisions. Under some conditions, and for a select set of problems and tasks, this promise has indeed been realized. But the new technologies and capabilities of the Information Age have, in addition to solving one set of problems, created the conditions that have led to a new set of problems. The increased access to information… has also enabled richer, more continuous interaction between and among individuals and organizations. Thus the same technologies designed to reduce uncertainty by creating and disseminating

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information have enabled real-time interactions never before imagined. As a result, events that may once have had isolated consequences can now generate cascades of consequences that can quickly spin out of control. This is the reality of our times…"

"Prediction is not possible… Both a new mindset and problem solving strategy is required. The most promising approach is to increase agility – the ability to effectively cope with rapid change…Being agile involves the ability to create an adequate understanding (awareness) of the environment and the ability to anticipate and/or detect and recognize a relevant change in circumstances. Being agile also requires the ability to respond appropriately, by acting in a timely manner or, indeed, by not acting…Agile people conceive and approach the world and their assigned tasks differently from those who are less agile. In general, agile people have a propensity to seek improvements, and are more willing to consider information that is at odds with preconceived notions [e.g., actively seek information that disconfirms their hypotheses], and are more willing to be different and take risks…It is possible to observe agile behavior or a lack of Agility only in hindsight…Agility is a latent property, a potential that remains dormant until it is manifested and its power realized. This presents difficulty for those who wish to make investment decisions based upon a definitive determination of the value of Agility…Robustness, flexibility and resilience all contribute to Agility, yet we limit these by not making them central to investment decisions and/or by placing significant constraints on individual and organizational behaviors."

In their paper ("Warning: Physics Envy May Be Hazardous to Your Wealth!"), Lo and Mueller also offer some suggestions for coping with a world in which uncertainty shocks are an integral and inevitable aspect of a system. They note that, "a successful application of quantitative methods to modeling any phenomenon requires a clear understanding of the level of uncertainty involved...The failure of quantitative models in economics and finance is almost always attributable to a mismatch between the level of uncertainty and the methods used to model it...An important ingredient in the successful implementation of any model is recognizing the boundaries of its validity." More concretely, they observe that "there are two responses to the recognition that, in

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the face of Level-4 or Level-5 uncertainty [see the first part of this series in last month's issue for a definition of these terms], a model is outside of its domain of validity. The first is to develop a deeper understanding of what is going on and to build a better model [for examples of the benefits which can result from this, see "The Virtues and Vices of Equilibrium and the Future of Financial Economics" by Farmer and Geanakoplos, "Top-Down versus Bottom-Up Macroeconomics" by Paul DeGrauwe, and "Financial Factors in Economic Fluctuations" by Christiano, Motto and Rostagno]. The second response to recognition that a model is outside its domain of validity is to admit ignorance and protect the portfolio by limiting the damage that the model could potentially do [e.g., stop loss orders, put options, position limits, allocations to volatility, etc.]...This brings us to risk management, which is the heart of investment management...A complete risk management protocol must contain risk models, but should also account for model risk – the tradeoff between making a decision when the model is wrong, and not making a decision when the model is right." We have previously written about another approach to this issue, emphasizing the findings of Francois Hemez and his colleagues from Sandia National Laboratories on the inescapable trade-offs between a model's fidelity to historical data, its robustness to uncertainty, and the confidence one should have in its predictions (see, for example, "Breaking the Myth of Predictive Modeling" by A.M. Singh). We have also frequently reported on the growing body of research that shows how confidence in prediction can be increased by combining the forecasts of models made using different underlying methodologies (see, for example, the recently published paper "Forecast Combinations" by Aiolfi, Capitstran and Timmerman).

Finally, James Montier (who is now at GMO) recently published a research white paper that calls for "a return to investing basics" in order to cope with a more volatile and uncertain environment ("I Want to Break Free, or, Strategic Asset Allocation Does Not Equal Static Asset Allocation"). He begins by noting that "in the beginning there was the idea of investment – straightforward, unconstrained investment. It was a simpler, happier time, when the essence of investment was to seek out value; to buy what was cheap with a margin of safety. Investors could move

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up and down the capital structure as they saw fit. If nothing fit the criteria for investing, then cash was the default option. But all of that changed with the rise of modern portfolio theory, and, not coincidentally, the rise of professional investment managers and consultants [and their obsession with comparative performance measurement]." Montier offers three criticisms of what has become the conventional wisdom with respect to "professional" investment management. We have also made these points quite a few times over the past fourteen years.

1. "Risk isn't volatility." Rather, "risk is the danger of a permanent loss of capital." Montier notes that this "can come about for three reasons: (1) valuation risk – you pay too much for an asset; (2) business risk – there are fundamental problems with the asset you are buying; and (3) financing risk – leverage."
2. Strategic asset allocation ignores valuation changes.
3. Performance benchmarking alters investment manager behavior in important ways, including promoting a focus on relative rather than absolute returns. As Montier notes, "Keynes' edict that 'it is better for reputation to fail conventionally than to succeed unconventionally' governs the day." Performance benchmarking also causes investment mangers "to ignore the endogenous nature of risk…Investors alter the returns they are likely to receive when they all chase after the same investments [Montier cites private equity as an example]."

Montier calls for a "return to a simpler, but more holistic approach to investing... Clients should liaise with their managers to set a realistic real return target…Having defined the target, managers should be given as much discretion as possible to deliver that real return, to avoid the benchmark hugging behavior that is typically induced by [static strategic asset allocations]." We have frequently noted the underappreciated importance of Montier's first point – whether one's goal is achieving a long-term real portfolio return target or beating an external benchmark has an extremely important impact on investor behavior. And we have also frequently noted the importance of

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allowing for deviations from long-term asset class allocation targets as valuations change (and the particular importance of avoiding dangerous overvaluations and the extremely damaging losses that follow them).

Montier also notes that successful implementation of a valuation-sensitive strategic asset allocation policy requires patience, "as valuations are only mean-reverting over relatively long periods of time…A willingness to be contrarian is also vital. You will inherently be doing the opposite of what everyone else regards as sensible. Being a contrarian involves three separate elements: (1) Having the courage to stand against the dominant view; (2) Being an independent thinker; and (3) Having the firmness of character to stick to your guns. All three of these traits are unnatural in human beings! … Provided that one can be patient and contrarian…changing your strategic asset allocation in response to the fluctuating opportunity set offered by Mr. Market [i.e., in response to valuation changes] seems like common sense to me. Sadly, of course, common sense tends to count for little in the world of high finance…" To that, all we can add is a heartfelt "Amen!"

So where does this leave us? As investors, we must learn to distinguish between risk – (randomness which can be made understandable through the use of probability or statistics) and uncertainty (randomness which can only be made understandable through the construction of an inevitably flawed mental model). We must be conscious of the powerful emotional and potential behavior impact of spikes in our perceived uncertainty. We must recognize that powerful forces, both within ourselves and within the networks of which we are a part, are guaranteed to generate these uncertainty spikes. The good news is that there are some early warning indicators we can use to detect – albeit weakly – signals of future spikes in uncertainty. That said, we must also recognize the limitations of these forecasting techniques, and acknowledge that agility – e.g., a willingness to adjust our asset allocation weights in light of surprising developments and valuation changes – rather than prediction is our best hope for protecting our portfolios when uncertainty jumps. There are also habits of mind – such as seeking disconfirming evidence, combining forecasts, and focusing on robustness as well as efficiency – that can help to insulate us from the worst

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emotional effects of uncertainty spikes. Finally, given the inevitability of surprising transitions into what we have termed the "High Uncertainty Regime", we also need to be willing to put in place portfolio defense measures – such as stop losses, long-dated deeply out of the money put options, and allocations to a wide range of asset classes, including volatility – well ahead of when they are needed, when the cost of doing so is cheap. We cannot escape uncertainty spikes. What we can do is increase the probability of achieving our long-term goals by learning to cope with these scary episodes better than other investors.

Global Asset Class Valuation Analysis

Our asset class valuation analyses are based on the belief that financial markets are complex adaptive systems, in which prices and returns emerge from the interaction of multiple rational, emotional and social processes. We further believe that while this system is attracted to equilibrium, it is generally not in this state. To put it differently, we believe it is possible for the supply of future returns a market is expected to provide to be higher or lower than the returns investors logically demand, resulting in over or underpricing relative to fundamental value. The attraction of the system to equilibrium means that, at some point, these prices are likely to reverse in the direction of fundamental value. However, the very nature of a complex adaptive system makes it hard to forecast when such reversals will occur. It is also the case that, in a constantly evolving complex adaptive system like a financial market, any estimate of fundamental value is necessarily uncertain. Yet this does not mean that valuation analyses are a fruitless exercise – far from it. For an investor trying to achieve a multiyear goal (e.g., accumulating a certain amount of capital in advance of retirement, and later trying to preserve the real value of that capital as one generates income from it), avoiding large downside losses is mathematically more important than reaching for the last few basis points of return. Investors who use valuation analyses to help them limit downside risk when an asset class appears to be substantially

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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 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

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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 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 30 Jun 10

Australia	**Low Demanded Return**	**High Demanded Return**
High Supplied Return	64%	96%
Low Supplied Return	96%	133%

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Canada	Low Demanded Return	High Demanded Return
High Supplied Return	63%	114%
Low Supplied Return	118%	180%

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Eurozone	Low Demanded Return	High Demanded Return
High Supplied Return	46%	81%
Low Supplied Return	79%	118%

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Japan	Low Demanded Return	High Demanded Return
High Supplied Return	75%	132%
Low Supplied Return	141%	212%

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United Kingdom	Low Demanded Return	High Demanded Return
High Supplied Return	29%	67%
Low Supplied Return	63%	106%

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United States	Low Demanded Return	High Demanded Return
High Supplied Return	68%	126%
Low Supplied Return	135%	209%

Switzerland	Low Demanded Return	High Demanded Return
High Supplied Return	56%	100%
Low Supplied Return	101%	221%

India	Low Demanded Return	High Demanded Return
High Supplied Return	62%	159%
Low Supplied Return	192%	339%

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Emerging Markets	Low Demanded Return	High Demanded Return
High Supplied Return	80%	171%
Low Supplied Return	121%	213%

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

Despite this, the months since March 2009 have seen a very strong rally develop in many equity markets, which, in some cases, has caused our valuation estimates to rise into the "overvalued" region. Given the absence of progress in reducing the three main obstacles that block a return to sustainable economic growth (see our recent Economic Updates), we believe that these rallies reflect investor herding, rather than any improvement in the underlying fundamentals. In turn, we strongly suspect that the root causes of this herding phenomenon, which appears to have strengthened in recent years, lie in a combination of the rising percentage of

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assets (and even higher percentage of trading) accounted for by delegated asset managers (rather than the investors who own the assets being traded), the incentive structure faced by these delegated managers (e.g., 2 and 20 on this years returns), and the rise of algorithmic trading.

Real Return Bonds

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

However, it is not the case that the economy does not grow; hence, the risk free rate we require also should reflect the fact that there will be more goods and services available in the future than there are today. Assuming investors try to smooth their consumption over time, the risk free rate should also contain a term that takes the growth rate of the economy into account. Broadly speaking, this growth rate is a function of the increase in the labor supply and the increase in labor productivity. However, the latter comes from both growth in the amount of capital per worker and from growth in "total factor productivity", which is due to a range of factors, including better organization, technology and education. Since capital/worker cannot be increased without limit, over the long-run it is growth in total factor productivity that ultimately drives the increase in productivity. Hence, in our analysis, we assume that future economic growth reflects the growth in the labor force and TFP.

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

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

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

The next table compares this long-term equilibrium real risk free rate with the real risk free return that is currently supplied in the market. Negative spreads indicate that real return bonds are currently overvalued, as their prices must fall in order for their yields (i.e., the returns they supply) to rise. The valuation is based on a comparison of the present values of ten year zero coupon bonds offering the rate demanded and the rate supplied, as of **30 Jun 10**:

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Region	Risk Free Rate Demanded	Actual Risk Free Rate Supplied	Difference	Overvaluation (>100) or Undervaluation (<100)
Australia	2.2	2.5	0.3	97
Canada	2.8	1.4	-1.4	115
Eurozone	2.9	1.5	-1.4	115
Japan	2.8	1.5	-1.3	113
United Kingdom	2.8	0.6	-2.2	124
United States	2.5	1.2	-1.3	113

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 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

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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 30 Jun 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
Australia	2.49%	2.96%	5.45%	5.11%	-0.34%	**3.26%**	2.56%

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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
Canada	1.37%	2.40%	3.77%	3.09%	-0.68%	**6.75%**	1.70%
Eurozone	1.53%	2.37%	3.90%	2.58%	-1.32%	**13.65%**	1.03%
Japan	1.50%	0.77%	2.27%	1.09%	-1.18%	**12.31%**	-0.40%
UK	0.65%	3.17%	3.82%	3.35%	-0.47%	**4.63%**	2.68%
USA	1.22%	2.93%	4.15%	2.96%	-1.19%	**12.20%**	1.72%
Switz.	1.46%	2.03%	3.49%	1.53%	-1.96%	**21.06%**	0.07%
India	1.46%	7.57%	9.03%	6.89%	-2.14%	**21.91%**	5.35%

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

It is important to note some important limitations of this analysis. Our bond market analysis uses historical inflation as an estimate of expected future inflation over the long-term. This may not produce an accurate valuation estimate, if the historical average level of inflation is not a good predictor of future average inflation levels. This risk is especially acute today, when the world economy is operating in unchartered waters, and faces both deflationary pressures (from falling demand relative to productive capacity, and significant debt servicing problems in the private sector) and inflationary pressures (from unprecedented peacetime government deficits, that are largely being financed by central banks under the "quantitative easing" programs). Under these circumstances, one could argue that many nominal return government bonds might in fact be underpriced today, over a shorter time horizon (more likely to experience deflation), while overpriced over a longer time horizon (that is more likely to see higher levels of inflation). 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, which we know all too well).

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

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

	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%

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

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

Credit Spreads

Let us now turn to the subject of the valuation of non-government bonds. Some have suggested that it is useful to decompose the bond yield spread into two parts. The first is the difference between the yield on AAA rated bonds and the yield on the ten year Treasury bond. Because default risk on AAA rated companies is very low, this spread primarily reflects prevailing liquidity and jump (regime shift) risk conditions (e.g., between a low volatility, relatively high return regime, and a high volatility, lower return regime). The second is the difference between BAA and AAA rated bonds, which tells us more about the level of compensation required by investors for bearing relatively high quality credit risk. Research has also shown that credit spreads on longer maturity intermediate risk bonds has predictive power for future economic demand growth, with a rise in spreads signaling a future fall in demand (see "Credit Market Shocks and Economic Fluctuations" by Gilchrist, Yankov, and Zakrajsek).

The following table shows the statistics of the distribution of these spreads between January, 1986 and December, 2009. 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	1.24	0.98
Standard Deviation	1.13	0.89

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	AAA – 10 Year Treasury	BAA-AAA
Skewness	0.47	0.42
Kurtosis	0.90	3.00

At **30 Jun 10**, the AAA minus 10 year Treasury spread was 1.70%. The AAA minus BAA spread was 1.39%. Since the distributions of AAA and BAA credit spreads are not normal (i.e., they do not have a "bell curve" shape), w need to look at history rather than Gaussian (normal curve) statistics to put them into perspective. Over the past twenty-four years, only 8.6% of all trading days had a higher AAA-Treasury spread. Over the same period, only 4.4% of all trading days had a higher AAA-BBB spread.

Over a longer-term time horizon, when liquidity and credit risk premiums would be expected to return to their historical averages, one can argue that credit is underpriced today, given high prevailing yields. 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 spreads and their long-term averages (1.24% and .98%, respectively) 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 likely overpriced today, given the increasingly uncertain economic outlook and difficulty in accurately estimating future default and loss given default rates.

Currencies

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Let us now turn to currency prices and valuations. For an investor contemplating the purchase of foreign bonds or equities, the expected future annual percentage change in the exchange rate is also important. Study after study has shown that there is no reliable way to forecast this, particularly in the short term. At best, you can make an estimate that is justified in theory, knowing that in practice it will not turn out to be accurate, especially over short periods of time (for a logical approach to forecasting equilibrium exchange rates over longer horizons, see "2009 Estimates of Fundamental Equilibrium Exchange Rates" by Cline and Williamson).

In our case, we have taken the difference between the yields on ten-year government bonds as our estimate of the likely future annual change in exchange rates between two regions. According to theory, the currency with the relatively higher interest rates should depreciate versus the currency with the lower interest rates. Of course, in the short term this often doesn't happen, which is the premise of the popular hedge fund "carry trade" strategy of borrowing in low interest rate currencies, investing in high interest rate currencies, and, essentially, betting that the change in exchange rates over the holding period for the trade won't eliminate the potential profit. Because (as noted in our June 2007 issue) there are some important players in the foreign exchange markets who are not profit maximizers, carry trades are often profitable, at least over short time horizons (for an excellent analysis of the sources of carry trade profits – of which 25% may represent a so-called "disaster risk premium", see "Crash Risk in Currency Markets" by Farhi, Frailberger, Gabaix, Ranciere and Verdelhan). Our expected medium to long-term changes in exchange rates are summarized in the following table:

Annual Exchange Rate Changes Implied by Bond Market Yields on 30 Jun 10

	To AUD	To CAD	To EUR	To JPY	To GBP	To USD	To CHF	To INR
From								
AUD	0.00%	-2.02%	-2.53%	-4.02%	-1.76%	-2.15%	-3.58%	1.78%
CAD	2.02%	0.00%	-0.51%	-2.00%	0.26%	-0.13%	-1.56%	3.80%

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	To AUD	To CAD	To EUR	To JPY	To GBP	To USD	To CHF	To INR
EUR	2.53%	0.51%	0.00%	-1.49%	0.77%	0.38%	-1.05%	4.31%
JPY	4.02%	2.00%	1.49%	0.00%	2.26%	1.87%	0.44%	5.80%
GBP	1.76%	-0.26%	-0.77%	-2.26%	0.00%	-0.39%	-1.82%	3.54%
USD	2.15%	0.13%	-0.38%	-1.87%	0.39%	0.00%	-1.43%	3.93%
CHF	3.58%	1.56%	1.05%	-0.44%	1.82%	1.43%	0.00%	5.36%
INR	-1.78%	-3.80%	-4.31%	-5.80%	-3.54%	-3.93%	-5.36%	0.00%

Commercial Property

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

Our analysis also assumes that over the long-term, investors require a 3.0% risk premium above the yield on real return bonds as compensation for bearing the risk of securitized commercial property as an asset class. Last but not least, there is significant research evidence that commercial property markets are frequently out of equilibrium, due to slow adjustment processes as well as the interaction between fundamental factors and investors' emotions (see, for example, "Investor Rationality: An Analysis of NCREIF Commercial Property Data" by Hendershott and MacGregor; "Real Estate Market Fundamentals and Asset Pricing" by Sivitanides, Torto, and Wheaton; "Expected Returns and Expected Growth in Rents of Commercial Real

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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 **30 Jun 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 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	7.1%	0.2%	7.3%	2.5%	3.0%	5.5%	75%
Canada	6.5%	0.2%	6.7%	1.4%	3.0%	4.4%	64%
Eurozone	4.7%	0.2%	4.9%	1.5%	3.0%	4.5%	91%
Japan	6.0%	0.2%	6.2%	1.5%	3.0%	4.5%	71%
Switzerland*	3.2%	0.2%	3.4%	1.5%	3.0%	4.5%	133%
U.K.	4.4%	0.2%	4.6%	0.6%	3.0%	3.6%	79%
U.S.A.	4.0%	0.2%	4.2%	1.2%	3.0%	4.2%	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

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

Commodities

Let us now turn to the Dow Jones AIG Commodity Index (now known as the DJ UBS Commodity Index), our preferred benchmark for this asset class because of the roughly equal weights it gives to energy, metals and agricultural products. One of our core assumptions is that financial markets function as a complex adaptive system which, while attracted to equilibrium (which generates mean reversion) are seldom in it. To put it differently, we believe that investors' expectations for the returns an asset class is expected to supply in the future are rarely equal to the returns a rational long-term investor should logically demand. Hence, rather than being exceptions, varying degrees of over and under pricing are simply a financial fact of life. We express the demand for returns from an asset class as the current yield on real return government

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

The general form of the supply of returns an asset class is expected to generate in the future is its current yield (e.g., the dividend yield on equities), plus the rate at which this stream of income is expected to grow in the future. The key challenge with applying this framework to commodities is that the supply of commodity returns doesn't obviously fit into this framework. Broadly speaking, the supply of returns from an investment in commodity index futures comes from four sources. First, since commodity futures contracts can be purchased for less than their face value (though the full value has to be delivered if the contract is held to maturity), a commodity fund manager doesn't have to spend the full $100 raised from investors to purchase $100

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of futures contracts. The difference is invested – usually in government bonds – to produce a return.

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

However, in the real world, all things are not equal. For example, some commodities are very difficult or expensive to store; others have very high costs if you run out of them (e.g., because of rapidly rising demand relative to supply, or a potential disruption of supply). For these commodities, there may be a significant option value to holding the physical product (the Theory of Storage refers to this option value as the "convenience yield"). If this option value is sufficiently high, spot prices may be bid up

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above futures prices, causing "backwardation" and positive roll-yields for commodity index funds. Hence, a key question is the extent to which different commodities within a given commodity index tend to be in backwardation or contango over time. Historically, most commodities have spent time in both states. However, contango has generally been more common, but not equally so for all commodities. For example, oil has spent relatively more time in backwardation, as have copper, sugar, soybean meal and lean hogs. Moreover, because of changing supply and demand conditions in many physical commodity markets (e.g., global demand has been growing, while marginal supplies are more expensive to develop and generally have long lead times), it is not clear that historical tendencies toward backwardation or contango are a good guide to future conditions.

To the extent that any generalizations can be made, higher real option values, and hence backwardation and positive roll returns are more likely to be found when demand is strong and supplies are tight, and/or when there is a rising probability of a supply disruption in a commodity where storage is difficult. For example, ten commodities make up roughly 75% of the value of the Dow Jones AIG Commodities Index. The current term structures of their futures curves are as follows on **30 Jun 10**:

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

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

Given the continued presence of so many contangoed futures curves, expected near term roll returns on the DJAIG as a whole are still negative, absent major supply side shocks. On a weighted basis (using the DJAIG weights), the forward premium (relative to the spot price) at the end of **Jun** was 0.54%, compared to .74%. one month previously, 1.14% two months ago, and .63% three months ago. Remember, a forward premium means the roll return will be negative (because the futures investor will be selling the maturing contract at a lower price than he or she must pay to replace it with a longer-dated contract). Roll returns are positive only when there is a forward discount (when the average price of a futures contract with a long maturity is lower than the price of a contract with a very short maturity).

This brings us to the third source of return for long-only commodity futures funds: unexpected changes in the price of the commodity during the term of the futures contract. It is important to stress that the market's prevailing consensus about the expected change in the spot price is already included in the futures price that is paid when the contract is purchased. The source of return we are referring to here is

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

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

So, to sum up, the expected supply of returns from a commodity index fund over a given period of time equals (1) the current yield on real return bonds, reduced by the percentage of funds used to purchase the futures contracts; (2) expected roll yields, adjusted for commodities' respective weights in the index; (3) unexpected spot price changes; and (4) the expected rebalancing return. Of these, the yield on real

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

Another approach to assessing the valuation of commodities as an asset class is to compare the current value of the DJAIG Index to its long-term average. Between 1991 and 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 **30 Jun 10** closing value of 78.87 was an estimated .76 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 the time horizon being used.

There are three arguments that, on a medium term (three to five year) view, commodities are underpriced today. The first is the large amount of monetary easing underway in the world, which, at some point, could lead to higher inflation. The second is the equally large amount of fiscal stimulus being applied to the global economy, with its focus on infrastructure projects, should eventually boost demand for commodities

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(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 overpricerd 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 (including a major slowdown in Chinese growth), which will reduce the demand for commodities; and (c) that in 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 medium term 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, over a three to five year time horizon, commodities are likely overpriced today.

Gold

Gold is extremely difficult to value, because it produces no explicit current income stream (i.e., yield). It price seems to be driven by a combination of worries about future inflation, and, more powerfully, from uncertainty about the ability of U.S. government securities to provide a stable, liquid store of value in highly uncertain periods. Since investor concerns in both of these areas seem to be increasing, gold prices have been increasing.

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Structural changes in financial markets may also be contributing to the rise in gold prices Moreover, the transmission of increasing investor worries into rising gold prices has been made much easier by the expanding range of gold ETF products that make easier to invest in this commodity. Unfortunately, this has also made it much easier to apply momentum strategies in this asset class, and to facilitate herding and bubbles.

A third, and more quantitative, approach to assessing gold prices was described at length in our January 2010 article on gold as a separate asset class. Under the normal regime, when the yield on U.S. real return bonds is lower than approximately 2.35%, there tends to be upward pressure on the price of gold; when the yield on U.S. real return bonds is above this level, gold seems to experience downward price pressure. At the end of **June**, the yield on a 10-year USD real return bond was about 1.22%, which implies further upward pressure on gold prices. However, when financial markets are in the high uncertainty or high inflation regime, the risk premium investors demand to hold gold switches from negative (reflecting its role as portfolio insurance under normal conditions) to positive (reflecting the expected positive payoff of that insurance when other returns on other asset classes turn negative). The offset to this on the supply side are increases in the real price of gold above the 1.75% expected in normal time. Under these conditions, the gold market can operate far from equilibrium under the influence of investor herding that drives the supply of returns well above the level of returns investors should logically demand in exchange for holding gold during the high uncertainty and high inflation regimes. Hence, while under these regimes gains on gold can offset losses on other asset classes, so too will the gold market have a tendency to become increasingly fragile and unstable, and crash probabilities increase.

Today, all of the latter factors seem to be at work, and the recent pause in the accelerating upward climb in gold prices further reinforces the impression that the gold market may indeed be in a very fragile state. Conditions in the gold futures market may provide some indication of what lies ahead. Over the past month, gold futures have become slightly backwardated, with a forward premium (based on the price

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difference between the two nearest month contracts) of only (.04%). We view this as further evidence of the gold market's fragile state. While further negative surprises that raise perceived uncertainty could yet drive gold prices higher (the most powerful of which would be increased worries about the creditworthiness of U.S. Treasury securities), we conclude that at present gold is likely overvalued.

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.

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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.

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

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photosynthesis, trees sequester a portion of the carbon dioxide that would otherwise be added to the earth's atmosphere.

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

The third set of economic processes that affects the growth rate of dividends includes changes in a timber REIT's cost structure, and in its non-timber related revenue streams (e.g., proceeds from selling timber land for real estate development or conservation easements). For example, if wood prices decline, and non-timber sources of revenue dry up (as is happening during the current recession), a timber

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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 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-

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Growth Driver	Assumption
	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 index and those on real return bonds has averaged around six percent. However, since the timber REITS are much more liquid than the properties included in the NCRIEF index, and since timber has displayed a very low correlation with returns on other asset classes (particularly during the worst of the 2008 crisis, even in the case of liquid timber vehicles), we use three percent as the required return premium for investing in liquid timberland assets. Arguably, because a portion of timber's return generating process (physical growth) has zero correlation with the return generating processes for other asset classes, we should use an even lower risk premium. Again,

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we believe our approach is conservative in this regard. Given these assumptions, our assessment of the valuation of the timber asset class at **30 Jun 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)	4.70%
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	**5.70%**
Real Bond Yield	1.22%
Plus Risk Premium for Timber	3.00%
Equals Average Annual Real Return Demanded	**4.22%**
Ratio of Returns Demanded/Returns Supplied Equals Valuation Ratio (less than 100% implies undervaluation)	**68%**

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

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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 likely underpriced today.

In sum, timber valuation is an issue upon which reasonable people can and do disagree, in no small measure because of their different time horizons and the different underlying assumptions and methodologies they use to reach their conclusions. On balance, taking a long-term view, we continue to believe that timberland is likely underpriced today, for three reasons: (1) future revenue growth related to 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 commodities. Between January 2, 1990 and December 31, 2009, the average daily value of the VIX Index was 20.29 (median 18.77), with a standard deviation of 8.36 (skewness 2.05, kurtosis 7.28 – i.e., a very "non-normal" distribution). On **31 Jun 10**, the VIX closed at 34.54. To put this in perspective, only 5.5% of the trading days in our sample had higher closing values of the VIX. In sum, at the end of last month, volatility had returned to a level that we believe is more consistent with the high uncertainty regime that we expect to prevail in global financial markets over the next year. For these reasons as of **30 Jun 10** we are neutral on the issue of whether

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

Sector and Style Rotation Watch

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

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

We publish this table to make an important point: there is nothing unique about the various rotation strategies we describe, which are widely known by many

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investors. Rather, whatever active management returns (also known as "alpha") they are able to generate is directly related to how accurately (and consistently) one can forecast the turning points in the economic cycle. Regularly getting this right is beyond the skills of most investors. In other words, most of us are better off just getting our asset allocations right, rather than trying to earn extra returns by accurately forecasting the ups and downs of different sub-segments of the U.S. equity and debt markets (for three good papers on rotation strategies, see “Sector Rotation Over Business Cycles” by Stangl, Jacobsen and Visaltanachoti; “Can Exchange Traded Funds Be Used to Exploit Industry Momentum?” by Swinkels and Tjong-A-Tjoe; and “Mutual Fund Industry Selection and Persistence” by Busse and Tong).

That being said, the highest rolling three month returns in the table do provide us with a rough indication of how investors expect the economy and interest rates to perform in the near future. *The highest returns in a given row indicate that a plurality of investors (as measured by the value of the assets they manage) are anticipating the economic and interest rate conditions noted at the top of the next column* (e.g., if long maturity bonds have the highest year to date returns, a plurality of bond investor opinion expects rates to fall in the near future). Comparing returns across strategies provides a rough indication of the extent of agreement (or disagreement) investors about the most likely upcoming changes in the state of the economy. When the rolling returns on different strategies indicate different conclusions about the most likely direction in which the economy is headed, we place the greatest weight on bond market indicators. Why? We start from a basic difference in the psychology of equity and bond investors. The different risk/return profiles for these two investments produce a different balance of optimism and pessimism. For equities, the downside is limited (in the case of bankruptcy) to the original value of the investment, while the upside is unlimited. This tends to produce an optimistic view of the world. For bonds, the upside is limited to the contracted rate of interest and getting your original investment back (assuming the bonds are held to maturity). In contrast, the downside is significantly greater – complete loss of principal. This tends to produce a more pessimistic (some might say realistic) view of the world (although some might argue

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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. Finally, we note that this table shows a dramatic (negative) change in investor sentiment compared to last month, particularly in the bond market.

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

Rolling 3 Month Returns Through	***30 Jun 10***			
Economy	Bottoming	Strengthening	Peaking	Weakening
Interest Rates	Falling	Bottom	Rising	Peak
Style and Size Rotation	Small Growth (DSG) **-9.51%**	Small Value (DSV) **-10.11%**	Large Value (ELV) **-10.41%**	Large Growth (ELG) **-12.21%**
Sector Rotation	Cyclicals (RXI) **-11.45%**	Industrials (EXI) **-12.60%**	Staples (KXI) **-8.49%**	Utilities (JXI) **-10.21%**
Bond Market Rotation	Higher Risk (HYG) **-1.73%**	Short Maturity (SHY) **1.17%**	Low Risk (TIP) **4.00%**	Long Maturity (TLT) **14.78%**

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Product and Strategy Notes

New Analyses on Gold as an Asset Class

Two pieces of research recently came to our attention that merit another look at gold as an asset class, which we most recently covered in our January 2010 issue. The first is a paper that was written in 2005 by Faugere and Van Erlach, titled "The Price of Gold: A Global Required Yield Theory." The authors begin with a statement that most would agree with: "Assessing the fair value of gold largely remains a mystery in finance." With that in mind, they offer "an asset pricing theory that treats gold as a store of wealth." Their core assumption is what they term "required yield theory" "explains the valuation of financial assets via investors' general requirement to earn a minimum expected after tax real return equal to long-term GDP per capita growth." Based on data from the IMF World Economic Database, we estimate that the average growth rate of real global GDP/capita between 1981 and 2009 was 1.8% per year. We also observe that this very roughly corresponds to the average growth rate for total factor productivity over this period (average annual real GDP growth of 3.3%, less average annual population growth of 1.5%).

The authors further note that, "gold fulfills the unique value of a global store of value…that is, a hedging instrument against inflation and the collapse of value of other asset classes." They then assert that, "(1) the global real price of gold essentially is a real Price/Earnings ratio for gold, where 'earnings' represent purchasing power or a global price index…We define the forward P/E for gold as the nominal price of gold divided by the expected GDP price deflator in the next period; (2) The global real price of gold must vary inversely to all other main financial asset classes real price/earnings ratio in order to preserve the real value of any investor's capital against adverse movements in the values of financial asset classes…Capital flows to gold are dictated by changes in the minimum expected return achievable by other asset classes…Our

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theory postulates that movements in the global real price of gold occur because of the precautionary demand for gold, which largely depends in the inverse real P/E of other asset classes combined." In practice, however, the authors "assume that the main alternative investment asset class is a stock market index...[Therefore] the global real price of gold must vary inversely with the global stock market forward P/E." Put another way, a change in the earnings yield (E/P) should produce the same change in the price of gold. The authors claim that this "after-tax stock market forward earnings yield [E/P] can be viewed as a minimum expected return…which must equal a required yield given by the sum of the GDP/capita long-term growth rate and the current expected inflation rate." So if either of these changes, so to does E/P and thus the price of gold.

Let's put some numbers on this. At the end of June 2010, the P/E for the FTSE All-World Index was 17.9. Inverting that, the E/P or earnings yield was 5.60%. Subtracting from that our average long-term real growth rate of global GDP/capita of 1.8% leads to an implied expected inflation rate of 3.8%. The just published IMF World Economic Outlook update forecasts an average global inflation rate in 2011 of 2.9%. Adding back our 1.8% long-term real GDP/capita growth rate gives us a target earnings yield of 4.7%. Inverting that gives us a target P/E of 21.3% -- a 19% increase over the current 17.9 P/E. That implies a fall in gold prices of (19%). Applying that to the current gold price of $1,186 gives a forecast 2011 gold price of $961. Of course, if the current fears of deflation are accurate, then the IMF's forecast for global inflation in 2011 could be much too high. In that case, based on the authors' theory, the gold price would fall by much, much more next year.

So what are we to make of this approach to determining the fundamental value of gold? We have an issue with the author's basic assumption that investors seek the same real earnings yield on all asset classes, which is equal to the long-term average growth of real global GDP/capita (which, as we noted, roughly corresponds to the long-term rate of total factor productivity growth). At the highest level of aggregation, and in the long-run, it is certainly true that total factor productivity growth determines the size of the pie that can be divided between wages paid to labor, returns to capital

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providers, and taxes. However, even in this case, changes in the bargaining power of these three groups should cause their returns to vary across countries and over time. At a more micro level, in so far as different asset classes have more or less uncertainty and risk, so too should investors require higher or lower real returns to hold them. On balance, we think both theory and evidence weigh against the assumption of "required yield theory."

But that doesn't necessarily mean that gold could not, as the authors assert, serve as a hedge against varying real earnings yields (or, inversely, P/Es) in a given asset class. In their paper, the authors compare gold to equities. In this regard, we noted the following in our January 2010 article on gold's potential long-term role in a portfolio: "In "Is Gold a Hedge or a Safe Haven?", Baur and Lucey distinguish between hedges, where one asset class has a long-term negative or zero correlation of returns with another, and "safe havens" where this relationship only occurs under extreme conditions. Examining U.S., U.K. and German stock and bond prices, they find that "gold is a hedge against stocks, gold is a safe-haven in extreme stock market conditions, but "gold is neither a hedge nor a safe haven for bonds." In a subsequent paper ("Is Gold a Safe Haven? International Evidence"), Baur and McDermott find that "gold is a safe haven for major European and U.S. equity markets, but not for Australian, Canadian, Japanese or large emerging equity markets." In light of this, we would say that other evidence only partially supports the authors global contention that changes in equity P/Es (and inflation) drive changes in real (nominal) gold prices. However, given the outsized impact of the U.S. equity market on global perceptions of uncertainty, we think the author's approach has some merit.

So let's repeat our previous calculations, this time focusing only on the U.S. equity market, where, using the same FTSE All World data, the end of June P/E was 21.9. Inverting that gives an earnings yield of 4.57%. Subtract the 1.8% long-term productivity growth assumption and you get an implied inflation expectation of 2.77%. The most recent IMF World Economic Outlook forecasts 2011 U.S. inflation of only 1.86%. Add the 1.8% productivity growth assumption to this to get an expected 2011 earnings yield of 3.66%. Invert that to get a forecast P/E of 27.32. Since this

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represents a 24.75% increase in the P/E, it implies, per the authors' theory, a decrease of the same percentage in the price of gold, or a decline to $892/ounce from the current price of $1,186/ounce.

Let's now compare this to another approach to fundamentally valuing gold, which we described in our January 2010 analysis. We will also modify that approach a bit, to incorporate some aspects of the just described "required yield theory." Our approach to asset pricing theory is based on a few key assumptions: (1) Asset prices reflect the interaction of the supply of and demand for real returns from a given asset class; (2) The supply of returns reflects the current yield provided by an asset class, plus expected changes in its price over a given period of time; (3) The demand for returns reflects the prevailing real risk free rate plus a required risk premium; (4) Imbalances between the supply of and demand for returns are normal feature of asset markets; (5) While asset markets are drawn to an equilibrium where the supply of returns equals the demand for returns, they can operate far from equilibrium for extended periods of time; and (6) Asset markets return to equilibrium due to changes in all four underlying variables – the current yield of the asset, expectations for future price changes, the real risk free interest rate, and required risk premiums.

In our January article, we described we would expect the real price of gold to increase by about 1.75% per year – the difference between our assumed long-term growth rate of real global GDP of 3.25% per year and our assumed long-term growth rate of the world stock of gold of 1.50% per year. When we looked at the return for holding gold that an investor would logically demand, in terms of a risk premium above the real risk free interest rate, we found that it varied considerably depending on the regime that prevailed. In normal times, the risk premium has been negative (about 2.0% annually), reflecting the fact that gold plays the role of portfolio insurance, for which, in normal times, an investor should logically expect to pay, rather than receive, a risk premium. However, this insurance policy is expected to pay off under the high inflation and high uncertainty regimes, when the risk premium above the real risk free rate turns positive, ranging between 2.5% in the high inflation regime to 2.0% in the high uncertainty regime. Building on the required yield theory, we can further expand

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our description of the supply of gold returns, viewing 1.75% per year as the normal "income return" from holding gold, and adding to it the change in the price of gold that is driven by changes in perceived uncertainty and expected inflation – call it the "uncertainty return". We thus have a fully specified supply and demand equation for gold returns, with the return supplied equal to 1.75% plus the uncertainty return under some regimes, and the return demanded equal to the risk free rate plus the required risk premium.

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

We have also noted our view that gold is ultimately a hedge against declining trust in short term U.S. Treasury Bills (and, for some investors, the U.S. Dollar) as the safest and most liquid means of preserving the real value of one's wealth. But

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consider what happens to the supply/demand equation if that trust is eroded. For the supply of returns, the price of gold is driven up, and perhaps too the associated annual return from holding it. But on the demand side, declining faith in U.S. Treasuries should logically lead to a decline in the risk premium investor require to hold gold even under the high uncertainty or high inflation regimes. In this manner, declining faith in Treasuries only worsens the imbalance between the supply of and demand for returns from holding gold, and causes the gold asset pricing system to become ever more fragile. At the very least, this dynamic suggests that a commitment to systematic portfolio rebalancing is a critical requirement for anyone choosing to use gold as an asset class (as opposed to adding gold coins to the mix of currencies they hold to meet their need for liquidity and precautionary savings, rather than long-term investment needs). Moreover, our analysis also shows that, if one wants to make a long-term allocation to gold as a type of portfolio insurance, the right time to add it to a portfolio is when its price is very cheap, and not when its price has started to rapidly increase.

The second major gold research piece that caught our attention was a special section on the metal ("Store of Value") that appeared in the 10July2010 edition of *The Economist*. The article notes that "for investors in gold who think of it as an alternative to paper currencies, its attractiveness is intimately linked to their fears about the capacity of these other currencies to retain their value." The article goes on to note that "where the price of gold heads in the future depends on the answers to three questions. First, for how long will investors keep piling into gold? Second, if and when they quit the market, will the demand for gold jewelry revive enough to support the price near recent levels? Third, how will supply respond if the price stays high?" With respect to the first question, *The Economist* concludes that the answer "lies largely in the sate of the world economy. Western investors' new interest in gold has coincided with the rich world's deepest period of economic turmoil since the 1930s…In a world of unpredictable currencies, riven by fears of massive inflation and with enormous doubts about the true value of many other financial instruments, gold becomes an attractive option."

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Moving to the second question, The Economist notes that "at some point, either the worst fears of the gold bugs must be realized – in which case, heaven help us – or the world will become a less nervous place. When interest rates eventually rise, the opportunity cost of holding gold of holding gold will go up, taking off the shine…When the overall economic climate improves, so that uncertainty…is no longer so pervasive, that will provide another reason for some investors to retreat from gold." Unfortunately, "traditional markets for gold cannot be expected to pick up the [demand] slack if rich-world investors' appetites should pall." Finally, in response to the third question, The Economist concludes that "if prices [for gold] remain high, more of the world's existing stock will augment [the flow of market] supply. In theory, there is a lot more that could be sold for scrap…[and] the experience of the past year suggests that accounts of India's eternal attachment to gold are somewhat overplayed." In sum, "as long as the world economy remains uncertain and investors fear inflation and sovereign default, gold will keep its allure. Eventually, however, the price will weaken…and investors may look back on the bull run of 2009-2010, or 2009 -2011, with the sort of wonder that humanity has too often reserved for the yellow metal itself."

Advisers' Corner

Every month we review lots of research papers. Most of them are of interest only to other academics. But some of them have practical implications for our readers, either because they suggest new courses of action, or confirm the instincts of the best managers and advisers. The following are brief summaries of research papers that we believe will be of the most interest to our adviser subscribers.

- In "Persistence of Beliefs in an Investment Experiment", Ko and Huang "Test whether investors persist in their positions and inferences in spite of contrary information. They note that "several such biases whereby people accept favorable information and refute unfavorable information, have been documented in cognitive psychology. The first is the confirmation bias, which refers to the tendency to accept information that confirms

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prior beliefs and refute information that contradicts them…The second is that of the self-attribution bias, whereby people's belief in their own ability persists over time…People attribute success to ability and failure to bad luck…[The third] is motivated reasoning, whereby people passively accept desirable information but actively scrutinize undesirable information in order to contradict it." The authors find that "investors inferences are biased by their prior beliefs in a manner that depends on investment outcomes. Specifically, their perception of new information was more positively biased for their prior favored assets when they were incurring losses rather than gains…Overall, our results indicate that investors engaged in motivated reasoning to justify their prior choice of favored stock – i.e., they actively distorted new information about this stock more for losses than for gains…[This type of motivated reasoning] may also contribute to slow incorporation of new information in the price of loser stocks…Our results indicated that investors' beliefs should be more persistent when losing money, so that momentum ought to be stronger for loser than winner stocks. [Consistent with this], several papers have documented the fact that momentum is driven primarily by persistence in losers."

- De, Gondhi, Mnagla and Pochirajo cover similar ground in "Success/Failure of Past Trades and Trading Behavior of Investors". They find that "the success or failure of a trade, where a profitable trade indicates success and an unprofitable trade failure, influences the current trading decisions of investors [both the frequency and size of subsequent trades] more than the size of the gains or losses from the trades." They also find that "on average, this bias reduces the profits from current trades for investors." Similarly, in "Overconfidence Among Professional Investors", Putz and Ruenzi "find that mutual fund managers trade more after good past performance. This behavior is driven by good individual portfolio performance, while the market performance has no significant impact."

- In "Security, Potential, Goal Achievement and Risky Choice Behavior", Isacco Piccioni proposes a new models for risky choice behavior that captures some of the key assumptions that have long guided our thinking about asset allocation and risk management. More specifically, Piccioni "emphasizes agents' twin desire for downside

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protection and upside potential, as well as the importance of goal achievement in risky choice behavior. More technically, Target Utility Theory "is characterized by three main features. First, the utility function is defined over gains and losses with respect to a reference point or target returns. Second, investors are driven by the twin desire for downside protection and upside potential. Third, individuals have a greater preference for those choices that allow them to avoid more regret."

- In "How Investors Face Financial Risk: Loss Aversion and Wealth Allocation", Rengifo and Trifan "focus on the decision process of non-professional investors." They reach a number of interesting conclusions that will resonate with many professional advisors. These include: (1) "Past performance drives the current perception of the risky portfolio." (2) "The main source of fluctuations in investors perceptions of the risky portfolio is the frequency at which its performance is evaluated." (3) "The proportion of risky investments in the portfolio decreases quickly when investors check portfolio performance more than once per year." (4) Evaluating portfolio performance once a year "is optimal for generating positive attitudes towards risky investments." And (5), "Many studies might underestimate non-professional investors' actual aversion to financial losses."

- Does working with smart people improve your own performance? In "Peer Effects on Analyst Forecast Accuracy", Constantinos Antoniou of Durham Business School "examines whether security analysts' forecast accuracy is positively related to the accuracy of their colleagues." He finds that the effect is positive and significant, and "becomes more magnified when the forecasting task becomes more difficult."

- What drives rebalancing behavior in practice? In "The Impact of Risk and Return Perceptions on the Portfolio Reallocation Decisions of Mutual Fund Investors", Ederington and Golubeva begin by noting that, "a series of studies have found that future stock market returns and/or volatility are partially predictable from financial and macroeconomic variables , such as the current dividend yield or interest rate term structure…[Other studies] have found that the optimal portfolio allocation [between cash, bonds, and equities] of hypothetical investors should also be sensitive to

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changes in these variables." In the current study, the authors test these predictions against the behavior of real investors, specifically the way they reallocate assets between money market, bond and equity mutual funds. The authors find that "reallocation between equity and bond funds on one hand, and money market funds on the other are a strong positive function of the slope of the interest rate term structure." However, they "find little reaction to changes in the dividend yield." Rather, "in the aggregate, mutual fund investors tend to act as momentum investors as regards both stock and bond markets. When stock markets are high (negative) there is a strong net flow into (out of) equity funds from (into) money market funds. When bond market returns are high (negative), funds flow into (out of) bond funds from (into) money market funds." However, "equity and bond funds returns have only a small impact on flows between equity and bond funds" and "when long term interest rates rise so that bond prices fall and bond fund returns turn negative, funds tend to flow out of bond funds despite the rise in yields-to-maturity, underscoring the momentum behavior of bond fund investors." Also, "net equity fund exchanges are negatively correlated with changes in the VIX, and net bond fund exchanges are positively correlated…with a smaller impact on net exchanges with money market funds." Finally, the authors "find no evidence that mutual fund investors rebalance to restore their original portfolio allocation percentages following large stock or bond market movements. In other words, if a sharp stock market rise causes the actual equity percentage in an investors' portfolios to rise, they move funds into equity funds, not out."

- Here's some interesting research on mutual fund advertising: In "Worthless Warnings? Testing the Effectiveness of Disclaimers in Mutual Fund Advertisements", Mercer, Palmiter, and Taha observe that "mutual fund investors flock to funds with high past returns, despite there being little, if any, relationship between high past returns and high future returns. Because mutual fund management fees are based on the amount of assets invested in their funds, however, fund companies regularly advertise the returns of their high performing funds." Because of that, "The Securities and Exchange Commission requires fund advertisements to contain a disclaimer warning that past returns don't guaranteed future returns and that investors could lose money in these funds." After reviewing the available evidence and conducting further experiments, the

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authors conclude that the current SEC mandate "is completely ineffective. It neither reduces investors' propensity to invest in advertised funds nor diminishes their expectations regarding the funds' future returns." The good news is that the authors also conclude that "a stronger disclaimer – one that informs investors that high fund returns generally don't persist – would be much more effective."

- Sometimes we come across studies that leave us shaking our heads in amazement. Here are two recent ones. "In Physical Contact and Financial Risk Taking", Levav and Argo find that "minimal physical contact con increase people's sense of security and consequently lead them to increased financial risk taking behavior." They also found that this effect is particularly strong when the toucher is female, and weakens when a handshake is used instead of a subtler touch (a pat on the shoulder). As Argo noted in a separate interview about the study, "a woman's touch inspired feelings of comfort, confidence and security in the participants…It's a gentle touch, whereas a handshake is much more businesslike and formal – it signals something different…You might not actually stand there and say, 'Boy, that felt like what my mom used to do.' It happens instantaneously at an unconscious level and, as a result, makers you feel more secure so you're willing to take risks."

- In "A Corporate Beauty Contest", Braham, Harvey and Puri had "close to 2,000 subjects study the facial traits of CEOs." They found that "subjects rated CEO faces as appearing more competent and less likeable than non-CEO faces…Another experiment matched CEOs from large firms against CEOs from smaller firms and found that large-firm CEOs looked more competent and likeable...A third study found that executive compensation is linked to perceived competence ratings." The authors went on to explore the underlying factors driving facial-trait rating, and found that perceived "maturity" and "baby-facedness" were important drivers, "with the more mature faces assigned higher competence ratings." Finally, after examining corporate performance data, the authors "could find no evidence that the firms of competent-looking CEOs performed better. Essentially, the 'look' of competence says very little about effective competence." In a similar study ("Stocks of Admired Companies and Spurned Ones"), Anginer and Statman "studied Fortune magazine's annual list of

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'America's Most Admired Companies' and found that stocks of admired companies had lower returns, on average, than stocks of spurned companies from April 1983 through December 2007." They also found that "increases in admiration were followed by lower returns." Finally, among the spurned companies, "the dispersion of returns was high…implying that investors who want to benefit from the return advantage of spurned companies must diversify widely among them."

- Here's a good study to keep in mind the next time you wonder what is really going on inside your client's head. In "What You Don't Know Won't Hurt You: A Laboratory Analysis of Betrayal Aversion", Aimone and Houser find that the impact of betrayal aversion is substantial. "Holding fixed the probability of betrayal, the possibility of knowing that one has been betrayed reduced investment in a risky asset by about one-third." This helps to explain why betrayal aversion "leads many people to avoid risk more when a person, rather than nature, determines the outcome of uncertainty." This may also help to explain the psychological attraction of ETFs rather than individual stocks recommended by an advisor.

- The previous study is also interesting in the context of a new study done in Canada, where BlackRock recently released interesting findings about the views of high net worth investors. "More than 80 percent of HNW respondents felt it was important that financial planners put their client's interests first…76 percent of HNW investors said they turned to advisors for at least some advice…64 percent said they were reevaluating their portfolio mix…70 percent of HNW investors who are familiar with ETFs say they provide a significantly better rate of return than mutual funds…However, only 27 percent say their advisor, broker or financial planner has recommended that they buy an ETF…Nearly half of the 48 percent of HNW investors who said they own mutual funds believe that their mutual funds did not charge fees in the form of management expense ratios [!!!]…63 percent of HNW investors under age 35 felt it wasn't worth paying advisors for advice, compared to just 26 percent of those over 35."

- Another study may point to how advisors can improve their clients' satisfaction. In "To Do or to Have? That is the Question", Van Boven and Gilovich asked whether

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experiences make people happier than material possessions. They conclude that this is the case, and that "experiential purchases – those made with the primary intention of acquiring a life experience – made people happier than material purchases…[Because experiential purchases] are more open to positive reinterpretation, are a more meaningful part of one's identity, and contribute more to successful social relationships." When we read this, we thought of our observation that medical doctors seem to divide into two groups when confronted with patients who arrive for a consultation armed with a substantial amount of research they have collected online. One group, which seems more science oriented, paternalistic, and resentful of "patients trying to practice medicine." The other seems more oriented to engaging the patient in a relationship focused on improving health, and is much more encouraging and enthusiastic about online research that contributes to this outcome. In our experience with both types of doctors, we have that the former is more likely to be older, male and located on the East Coast of the U.S., while the latter is more likely to be younger, female and located on the West Coast. Overly broad generalizations to be sure, but still suggestive of the concepts that underlie this article. The relevance of this research to financial advisors seeking to grow their business seems clear – that offering clients a value proposition based on "doing" (e.g., learning to become an astute investor) is likely to be a superior value proposition to one that is focused on "having" (e.g., my advice will result in higher returns).

- Finally, many advisers know that one of the most challenging aspects of their job is to help clients keep money in the right perspective. This study should help you to do just that. In "Money Giveth, Money Taketh Away", Quoidbac, Dunn, Petrides and Mikolajczak "provide the first evidence that money impairs people's ability to savor everyday positive emotions and experiences. In a sample of working adults, wealthier individuals reported lower savoring ability (the ability to enhance and prolong positive emotional experience). Moreover, the negative impact of wealth in individuals' ability to savor undermined the positive effects of money on their happiness." In fact, when the authors "experimentally exposed participants in their experiments to a reminder of wealth", it "produced the same deleterious effect on their ability to savor as that produced by actual differences in wealth." The authors conclude that their evidence

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> "supports the widely held but previously untested belief that having access to the best things in life may actually undercut people's ability to reap enjoyment from life's small pleasures."

Model Portfolios Year-to-Date Nominal Returns

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- The target annual income an investor wants her or his portfolio to produce, expressed as a percentage of the starting capital. There are eight options for this input, ranging from 3 to 10 percent.

- The investor's desired savings and/or bequest goal. This is defined as the multiple of starting capital that one wants to end up with at the end of the chosen expected life. There are five options for this input, ranging from zero (effectively equivalent to converting one's starting capital into a self-managed annuity) to two.

- The investor's expected remaining years of life. There are nine possible values for this input, ranging from 10 to 50 years.

We use a simulation optimization process to produce our model portfolio solutions. A detailed explanation of this methodology can be found on our website. To briefly summarize its key points, in order to limit the impact of estimation error, our assumptions about future asset class rates of return, risk, and correlation are based on a combination of historical data and the outputs of a forward looking asset pricing

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model. For the same reason, we also constrain the maximum weight that can be given to certain asset classes in a portfolio. These maximums include 30% for foreign equities, 20% for foreign bonds, domestic and foreign commercial property, and commodities (including a sub-limit of 10% on timber), and 10% for emerging markets equities. There are no limits on the weight that can be given to real return and domestic bonds, and to domestic equities.

Each model portfolio solution includes the following information: (a) The minimum real (after inflation) internal rate of return the portfolio must earn in order to achieve the specified income and savings/bequest objectives over the specified expected lifetime. (b) The long-term asset allocation strategy that will maximize the probability of achieving this return, given our assumptions and constraints. (c) The recommended rebalancing strategy for the portfolio. And (d) the probability that the solution will achieve the specified income and savings/bequest goals over the specified time frame.

We use two benchmarks to measure the performance of our model portfolios. The first is cash, which we define as the yield on a one year government security purchased on the last trading day of the previous year. For 2010, our USD cash benchmark is .44% (in nominal terms). The second benchmark we use is a portfolio equally allocated between the ten asset classes we use (it does not include equity market neutral). This portfolio assumes that an investor believes it is not possible to forecast the risk or return of any asset class. While we disagree with that assumption, it is an intellectually honest benchmark for our model portfolios' results.

The year-to-date nominal returns for all these model portfolios can be found here: http://www.retiredinvestor.com/Members/Portfolio/USA.php

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