

Retired Investor

Invest Wisely...Get an Impartial Second Opinion.

Contents

<i>February 2010 Issue: Key Points</i>	<i>1</i>
<i>Global Asset Class Returns</i>	<i>3</i>
<i>Uncorrelated Alpha Strategies Detail</i>	<i>4</i>
<i>Overview of Our Valuation Methodology</i>	<i>5</i>
<i>Table: Market Implied Regime Expectations and Three Year Return Forecast</i>	<i>9</i>
<i>Table: Fundamental Asset Class Valuation and Recent Return Momentum</i>	<i>12</i>
<i>Investor Herding Risk Analysis</i>	<i>16</i>
<i>This Month's Letters to the Editor</i>	<i>18</i>
<i>February 2010 Economic Update</i>	<i>20</i>
<i>Global Asset Class Valuation Analysis</i>	<i>31</i>
<i>Norway Debates Factor Based Allocation and Active vs. Passive Investing</i>	<i>63</i>
<i>Product and Strategy Notes</i>	<i>79</i>
<i>Model Portfolios Year-to-Date Nominal Returns</i>	<i>85</i>
<i>Appendix: Economic Scenarios and Accumulated Evidence</i>	<i>86</i>

February 2010 Issue: Key Points

On the economic front, we believe we have recently passed a number of potentially important tipping points, involving recognition of the true nature of the predicament we face, the ability of Western societies and governments to meet the challenges that lie ahead, and the likely future behavior of China and Iran. Unfortunately, none of this bodes well for the future. We continue to believe that most investors still underestimate the probability that we will return to the high uncertainty regime. We also believe that this is generating significant asset class over and undervaluations.

This month's feature article reviews the debate underway at Norway's sovereign wealth fund over active versus passive management, and the use of a risk factor based approach to asset allocation. We use this as an opportunity to review the

confusing terminology that is used in this debate, including the meaning of terms such as active return, alpha, beta, exotic beta, alternative beta and the like. Our approach starts with the observation that the only portfolio that all investors can, if they choose, passively and simultaneously hold is the market cap weighted portfolio. Any deviation from this therefore represents some type of active management, whether it is based on holding preferences that differ from those of the average investor, or believing that one has a superior ability to forecast fundamental asset values and/or future investor behavior. As we have repeatedly noted over the years, we also believe that financial markets are a complex adaptive system that usually operate out of, but are drawn to, equilibrium and efficient asset pricing. This creates the opportunity for successful active management. However, more often than not, such efforts fail to produce anticipated results because of the constantly evolving nature of economic and financial market relationships and/or because of the incremental costs associated with active management, including trading commissions, bid/ask spreads, and market impact, as well as research and taxes. Given the challenges involved, we continue to believe that only certain active strategies make sense (those focused on uncorrelated alpha) and only for some investors (those who must achieve relatively high real returns to achieve their long term goals).

The issue of risk factor based asset allocation is also extremely interesting. However, we are a long way from endorsing it as an alternative to the traditional asset-class based approach. Why? First because given the continued debate over the definition and existence of different risk factors, and the underlying sources of the observed (and time varying) risk premiums for bearing them, we do not see a solid theoretical basis for estimating the equilibrium return an investor should expect to earn for exposure to different risk factors, or how these returns should vary under disequilibrium conditions (e.g., our high uncertainty and high inflation regimes). Second, as we have demonstrated in our Principal Components Analysis of asset class returns between 1990 and 2006 and then in 2007-2008, the loading of different asset classes on different statistical risk factors varies over time. This should also be the case for risk factors based on different methodologies, whether it be

macroeconomic variables, psycho-social variables (e.g., investor sentiment), or financial market variables (e.g., the value, small cap, credit, and momentum risk factors). As a practical matter, this seems to make the implementation of a risk factor based approach to asset allocation very difficult in an environment where both risk factor premiums and risk factor loadings on different asset classes are constantly changing over time. So while we continue to closely follow this extremely interesting debate, we won't be changing our approach to asset allocation any time soon.

Global Asset Class Returns

YTD 29Jan10	In USD	In AUD	In CAD	In EUR	In JPY	In GBP	In CHF	In INR
Asset Held								
USD Bonds	1.71%	2.87%	3.31%	4.83%	-0.98%	2.48%	3.63%	0.92%
USD Prop.	-5.32%	-4.15%	-3.72%	-2.20%	-8.01%	-4.55%	-3.40%	-6.11%
USD Equity	-3.50%	-2.33%	-1.90%	-0.38%	-6.19%	-2.73%	-1.58%	-4.29%
AUD Bonds	1.71%	2.88%	3.32%	4.84%	-0.98%	2.49%	3.64%	0.92%
AUD Prop.	-3.11%	-1.94%	-1.50%	0.02%	-5.80%	-2.33%	-1.18%	-3.90%
AUD Equity	-7.31%	-6.14%	-5.70%	-4.19%	-10.00%	-6.53%	-5.38%	-8.10%
CAD Bonds	0.07%	1.24%	1.68%	3.20%	-2.62%	0.85%	2.00%	-0.72%
CAD Prop.	0.38%	1.55%	1.98%	3.50%	-2.31%	1.15%	2.30%	-0.41%
CAD Equity	-6.59%	-5.43%	-4.99%	-3.47%	-9.28%	-5.82%	-4.67%	-7.38%
CHF Bonds	-1.63%	-0.46%	-0.02%	1.49%	-4.32%	-0.85%	0.29%	-2.42%
CHF Prop.	-0.23%	0.94%	1.38%	2.90%	-2.92%	0.55%	1.70%	-1.02%
CHF Equity	-4.36%	-3.19%	-2.75%	-1.24%	-7.05%	-3.58%	-2.43%	-5.15%
INR Bonds	2.32%	3.49%	3.92%	5.44%	-0.37%	3.09%	4.24%	1.53%
INR Equity	-5.55%	-4.38%	-3.94%	-2.42%	-8.24%	-4.77%	-3.62%	-6.34%
EUR Bonds	-0.97%	0.20%	0.63%	2.15%	-3.66%	-0.20%	0.95%	-1.76%
EUR Prop.	-3.27%	-2.10%	-1.66%	-0.14%	-5.96%	-2.49%	-1.34%	-4.06%
EUR Equity	-7.95%	-6.79%	-6.35%	-4.83%	-10.64%	-7.18%	-6.03%	-8.74%
JPY Bonds	2.30%	3.46%	3.90%	5.42%	-0.39%	3.07%	4.22%	1.51%
JPY Prop.	5.09%	6.26%	6.70%	8.21%	2.40%	5.87%	7.01%	4.30%
JPY Equity	1.03%	2.19%	2.63%	4.15%	-1.66%	1.80%	2.95%	0.24%
GBP Bonds	0.01%	1.18%	1.61%	3.13%	-2.68%	0.78%	1.93%	-0.78%
GBP Prop.	-7.52%	-6.35%	-5.91%	-4.40%	-10.21%	-6.74%	-5.59%	-8.31%
GBP Equity	-4.48%	-3.32%	-2.88%	-1.36%	-7.17%	-3.71%	-2.56%	-5.28%

YTD 29Jan10	In USD	In AUD	In CAD	In EUR	In JPY	In GBP	In CHF	In INR
1-3 Yr USGvt	0.80%	1.96%	2.40%	3.92%	-1.89%	1.57%	2.72%	0.00%
World Bonds	0.07%	1.24%	1.67%	3.19%	-2.62%	0.84%	1.99%	-0.72%
World Prop.	-5.63%	-4.47%	-4.03%	-2.51%	-8.32%	-4.86%	-3.71%	-6.42%
World Equity	-5.11%	-3.94%	-3.50%	-1.98%	-7.80%	-4.33%	-3.18%	-5.90%
Commod Long Futures	-7.90%	-6.74%	-6.30%	-4.78%	-10.59%	-7.13%	-5.98%	-8.69%
Commod L/Shrt	-8.11%	-6.94%	-6.50%	-4.99%	-10.80%	-7.33%	-6.19%	-8.90%
Gold	-1.26%	-0.09%	0.35%	1.86%	-3.95%	-0.48%	0.66%	-2.05%
Timber	-3.10%	-1.94%	-1.50%	0.02%	-5.79%	-2.33%	-1.18%	-3.90%
Uncorrel Alpha	0.02%	1.19%	1.62%	3.14%	-2.67%	0.79%	1.94%	-0.77%
Volatility VIX	26.45%	27.62%	28.06%	29.57%	23.76%	27.22%	28.37%	25.66%
Currency								
AUD	-1.17%	0.00%	0.44%	1.95%	-3.86%	-0.39%	0.76%	-1.96%
CAD	-1.60%	-0.44%	0.00%	1.52%	-4.29%	-0.83%	0.32%	-2.40%
EUR	-3.12%	-1.95%	-1.52%	0.00%	-5.81%	-2.35%	-1.20%	-3.91%
JPY	2.69%	3.86%	4.29%	5.81%	0.00%	3.46%	4.61%	1.90%
GBP	-0.77%	0.39%	0.83%	2.35%	-3.46%	0.00%	1.15%	-1.57%
USD	0.00%	1.17%	1.60%	3.12%	-2.69%	0.77%	1.92%	-0.79%
CHF	-1.92%	-0.76%	-0.32%	1.20%	-4.61%	-1.15%	0.00%	-2.71%
INR	0.79%	1.96%	2.40%	3.91%	-1.90%	1.57%	2.71%	0.00%

Uncorrelated Alpha Strategies Detail

As we have repeatedly noted over the years, actively managed strategies whose objective is to produce returns with low or no correlation with the returns on major asset classes (so-called “uncorrelated alpha strategies”) have an undeniable mathematical benefit for a portfolio. Moreover, the potential size of this benefit increases with the portfolio’s long-term real rate of return target. On the other hand, we have also repeatedly noted that, for a wide range of reasons, active management is an extremely difficult game to play consistently well, and that this challenge only increases with time. Hence, in our model portfolios, we have tried to strike an appropriate balance between these two perspectives. We start by limiting allocations to uncorrelated alpha to no more than ten percent of a portfolio. We then equally divide this allocation between four different strategies. Within each strategy, we track the performance of two liquid, retail funds which can be used to implement it, and which have far lower costs than the 2% of assets under management and 20% of profits typically charged by hedge fund managers using the same strategy (for more on the

advantages of such funds, see “How Do Hedge Fund Clones Manage the Real World?” by Wallerstein, Tuchshmid, and Zaker). The following table shows the year to date performance of these funds (which are listed by ticker symbol):

YTD 29Jan10	<u>In USD</u>	<u>In AUD</u>	<u>In CAD</u>	<u>In EUR</u>	<u>In JPY</u>	<u>In GBP</u>	<u>In CHF</u>	<u>In INR</u>
<i>Eq Mkt Neutral</i>								
HSKAX	0.51%	1.68%	2.12%	3.63%	-2.18%	1.29%	2.43%	-0.28%
OGNAX	-0.40%	0.77%	1.21%	2.72%	-3.09%	0.38%	1.52%	-1.19%
<i>Arbitrage</i>								
ARBFX	-0.08%	1.09%	1.53%	3.04%	-2.77%	0.70%	1.84%	-0.87%
ADANX	0.00%	1.17%	1.60%	3.12%	-2.69%	0.77%	1.92%	-0.79%
<i>Currency</i>								
DBV	-2.29%	-1.13%	-0.69%	0.83%	-4.98%	-1.52%	-0.37%	-3.09%
ICI	0.88%	2.05%	2.48%	4.00%	-1.81%	1.65%	2.80%	0.09%
<i>Equity L/S</i>								
HSGFX	0.16%	1.32%	1.76%	3.28%	-2.53%	0.93%	2.08%	-0.63%
PTFAX	2.70%	3.86%	4.30%	5.82%	0.01%	3.47%	4.62%	1.91%
<i>GTA</i>								
MDLOX	-2.52%	-1.35%	-0.91%	0.61%	-5.21%	-1.74%	-0.59%	-3.31%
PASAX	1.23%	2.39%	2.83%	4.35%	-1.46%	2.00%	3.15%	0.43%

Overview of Our Valuation Methodology

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

parameters. We term these three regimes “High Uncertainty”, “High Inflation” and “Normal Times.”

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

We believe that investors are best served when their primary performance benchmark is the long-term real return their portfolio must earn in order to achieve their long term financial goals. We believe the best way to implement this approach is via a portfolio of broadly defined, low cost, low turnover, asset class index products that provide exposure to a diversified mix of underlying return generating processes. In this context, conservatively managing risk in order to avoid large losses is mathematically more important than taking aggressive risk position to reach for additional returns via actively managed strategies. This is not to say that in some cases investors would benefit from those additional active returns. Such cases typically involve aggressive goals, low starting capital, low savings, and/or a short time horizon. In these situations, it is mathematically clear that an allocation to certain actively managed investment strategies can benefit a portfolio, provided the results of those strategies have a low or no correlation with returns on the investor's existing

allocations to broad asset class index products. The use of these “uncorrelated alpha” products has a further benefit, in that they avoid the situation (common in traditional actively managed funds) where an investor pays much higher fees to an active manager for performance that is, in fact, a mix of the index fund’s results (often referred to as “beta”) and the manager’s skill (often referred to as “alpha”).

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

We also recognize that the valuation analyses which form the basis for these risk management decisions all contain an irreducible element of uncertainty. Hence, we believe that investors’ fourth risk management discipline should be to combine our forecasts with those made by other analysts who use different methodologies.

Research has demonstrated that forecast combination, using either simple averaging or more complex methods, improves forecast accuracy.

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

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

Table: Market Implied Regime Expectations and Three Year Return Forecast

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

<i>Rolling Three Month Returns in USD</i>			29Jan10
<i>High Uncertainty</i>	<i>High Inflation</i>	<i>Normal Growth</i>	
Short Maturity US Govt Bonds (SHY) 0.54%	US Real Return Bonds (TIP) 2.18%	US Equity (VTI) 4.86%	
1 - 3 Year International Treasury Bonds (ISHG) -2.44%	Long Commodities (DJP) -2.48%	EAFE Equity (EFA) -0.61%	
Equity Volatility (VIX) -19.78%	Global Commercial Property (RWO) 2.12%	Emerging Equity (EEM) 2.78%	

<i>Rolling Three Month Returns in USD</i>			29Jan10
<i>High Uncertainty</i>	<i>High Inflation</i>	<i>Normal Growth</i>	
Gold (GLD) 3.35%	Long Maturity Nominal Treasury Bonds (TLT)* -2.65%	High Yield Bonds (HYG) 3.47%	
<i>Average</i> -4.58%	<i>Average (with TLT short)</i> 1.12%	<i>Average</i> 2.63%	
<i>Three Months Ago:</i> 7.95%	<i>Three Months Ago:</i> 4.82%	<i>Three Months Ago:</i> 4.82%	

* Falling returns on TLT indicate rising inflation expectations

As you can see, at the end of last month, the conventional wisdom appeared to favor normal times. It also appeared that investors (in aggregate) reduced the probability they attached to a return to the high uncertainty regime. As noted elsewhere in this issue, our view of the future is exactly the opposite.

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

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

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

Regime	Normal Regime	High Uncertainty Regime	High Inflation Regime	Forecast Annualized USD Real Return
<i>Assumed Regime Probability Over Next 36 Months</i>	20%	50%	30%	
<i>Real Rate Under Regime</i>	3.50%	2.50%	1.50%	2.40%
<u>Asset Class Premia</u>				
Domestic Bonds	1.0%	1.0%	-3.0%	2.20%
Foreign Bonds	0.5%	2.0%	0.5%	3.65%
Domestic Property	3.0%	-10.0%	1.0%	-1.70%
Foreign Property	3.0%	-10.0%	-1.5%	-2.45%
Commodities	2.0%	-6.0%	3.0%	0.70%
Timber	2.0%	-8.0%	1.0%	-0.90%
Domestic Equity	3.5%	-12.0%	-5.0%	-4.40%
Foreign Equity	3.5%	-12.0%	-7.0%	-5.00%
Emerging Equity	4.5%	-15.0%	1.0%	-3.90%
Gold	-2.0%	2.0%	2.5%	3.75%
Volatility	-25.0%	50.0%	25.0%	29.90%

Table: Fundamental Asset Class Valuation and Recent Return Momentum

The table at the end of this section sums up our conclusions (based on the analysis summarized in this article) as to potential asset class under and overvaluations at **29 Jan 10**. We believe that asset prices reflect the interaction of three broad forces. The first is fundamental valuation, as reflected in the balance between the expected supply of and demand for returns. The Global Asset Class Valuation Analysis of each month's journal contains an extensive discussion of fundamental valuation issues. One of our core beliefs is that while asset prices are seldom equal to their respective fundamental values (because the system usually operates in disequilibrium), they are, in the medium and long-run strongly drawn towards that attractor.

The second driver of asset prices, and undoubtedly the strongest in the short run, is investor behavior, which results from the interaction of a complex mix of

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

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

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

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

An exception to this approach is our assessment of the future return to local investors for holding U.S. dollars. In this case, our conclusions are mechanically driven

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

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

Valuation at 29Jan10	Current Price versus Long-Term Fundamental Valuation Estimate	Return Momentum (Most Dangerous Conditions are Positive Accelerating Momentum and Fundamental Overvaluation)	Rolling 3 Month Return in Local Currency	Rolling 3 Month Return 3 Months Ago
AUD Real Bonds	Neutral	Positive, Accelerating	4.17%	3.16%
AUD Bonds	Neutral	Positive, Accelerating	1.34%	1.14%
AUD Property	Neutral	Negative Reversal	-0.01%	14.41%
AUD Equity	Neutral	Negative Reversal	-1.05%	10.40%
CAD Real Bonds	Neutral	Positive, Accelerating	3.11%	2.64%
CAD Bonds	Possibly Overvalued	Positive, Slowing	1.35%	1.49%
CAD Property	Possibly Undervalued	Positive, Slowing	11.55%	12.70%
CAD Equity	Possibly Overvalued	Positive, Accelerating	2.45%	1.57%
CHF Bonds	Likely Overvalued	Positive, Accelerating	0.49%	-0.49%
CHF Property	Possibly Overvalued	Positive, Slowing	3.61%	15.74%
CHF Equity	Probably Overvalued	Positive, Slowing	2.69%	4.38%
EUR Real Bonds	Neutral	Negative Reversal	-0.04%	1.84%
EUR Bonds	Possibly Overvalued	Positive, Slowing	0.39%	0.58%
EUR Prop.	Possibly Undervalued	Positive, Slowing	0.71%	20.96%
EUR Equity	Likely Undervalued	Positive, Accelerating	1.65%	10.31%
GBP Real Bonds	Possibly Overvalued	Negative Reversal	-0.87%	6.28%
GBP Bonds	Neutral	Negative Reversal	-1.17%	3.69%
GBP Property	Possibly Undervalued	Negative Reversal	-4.32%	18.50%
GBP Equity	Likely Undervalued	Positive, Slowing	7.20%	10.26%
INR Bonds	Likely Overvalued	Positive Reversal	2.55%	-6.75%
INR Equity	Probably Overvalued	Positive, Accelerating	2.90%	1.44%
JPY Real Bonds	Neutral	Positive, Accelerating	4.88%	0.18%
JPY Bonds	Possibly Overvalued	Positive, Accelerating	0.89%	0.00%
JPY Property	Likely Undervalued	Negative Reversal	-0.91%	3.21%
JPY Equity	Probably Overvalued	Positive Reversal	3.91%	-8.70%
USD Real Bonds	Neutral	Positive, Slowing	1.98%	4.44%

Valuation at 29Jan10	Current Price versus Long-Term Fundamental Valuation Estimate	Return Momentum (Most Dangerous Conditions are Positive Accelerating Momentum and Fundamental Overvaluation)	Rolling 3 Month Return in Local Currency	Rolling 3 Month Return 3 Months Ago
USD Bonds	Possibly Overvalued	Positive Reversal	0.97%	-4.36%
USD Property	Possibly Undervalued	Positive, Slowing	8.28%	15.96%
USD Equity	Probably Overvalued	Positive, Slowing	4.84%	5.23%
Following in USD:				
Investment Grade Credit (CIU)	Possibly Overvalued	Positive, Slowing	2.11%	2.94%
High Yield Credit (HYG)	Probably Overvalued	Positive, Slowing	3.06%	3.21%
Emerging Mkt Equity (EEM)	Probably Overvalued	Positive, Slowing	2.89%	7.13%
Commodities Long	Likely Overvalued	Negative Reversal	-2.48%	4.29%
Gold	Likely Undervalued	Positive, Slowing	3.35%	9.83%
Timber	Possibly Undervalued	Positive, Accelerating	13.27%	1.78%
Uncorrelated Alpha	N/A	Positive, Slowing	0.93%	2.60%
Volatility (VIX)	Probably Undervalued	Negative Reversal	-19.78%	18.40%
Future Return in Local Currency from holding USD:	Based on Covered Interest Parity			
Returns to AUD Investor	Positive	Positive Reversal	2.03%	-12.84%
Returns to CAD Investor	Neutral	Negative, Accelerating	-2.14%	-0.47%
Returns to EUR Investor	Neutral	Positive Reversal	6.34%	-4.24%
Returns to JPY Investor	Negative	Neutral, Accelerating	0.00%	-5.84%
Returns to GBP Investor	Neutral	Positive, Accelerating	3.52%	0.78%
Returns to CHF Investor	Negative	Positive Reversal	2.94%	-4.97%
Returns to INR Investor	Positive	Negative, Slowing	-1.78%	-2.16%

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 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:

Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec09	Jan10
(0.57)	0.41	0.35	0.33	0.33	0.51	0.51	0.56	(0.30)	0.72	0.24	(0.03)

As you can see, in recent months global financial markets appear to have gone from a highly ordered and fragile state in November to one that was highly disordered by the end of January, and therefore at lower risk of a sudden, substantial, and highly correlated change in prices across multiple asset classes.

This Month's Letters to the Editor

Why did you shift from a long-only ETF for implementing your allocation to commodities to LSC?

LSC is an ETF that tracks the S&P Commodity Trends Indicator Index. That index uses a predefined rule set to take both long and short positions in different commodity futures. Most commodity index products only take long positions in commodity futures. We made the change last year, based on our conclusion that the substantial inflow of investor funds into commodity index products over the past three years has resulted in a structural change in the market that works against long-only investors. More specifically, the boost in futures demand has reduced or reversed the situation known as "backwardation" in which futures contracts typically traded at a discount to spot, which generated positive "roll returns" when contracts were sold near their maturity, and the proceeds used to buy a new, longer dated contract. Under these new structural conditions, we believe that it is advantageous to sometimes be a seller of commodity futures contracts; hence, our search for a product that would take both long and short positions in a disciplined manner. Obviously, S&P was thinking the same thing. Beyond this, our belief that permanent structural changes have occurred

in commodity markets has also led us to explore other alternative to getting exposure to this asset class. We have already written about direct investment in energy producing assets, and expect to further explore this issue in other articles this year.

When your publication recommended significantly increasing allocations to cash in May 2007, I thought you were irrational. It turned out you were correct. How was your timing in guiding readers back into the market?

It depends on your perspective, I guess. We have been pretty consistently skeptical about the dramatic recovery that took place in 2009. Back in March, when many equity market valuations had fallen to what we considered fair, but not greatly underpriced levels, we discussed the advantages of a slow return to the market over a period of time. That said, we continue to be primarily preoccupied with avoiding large losses rather than capturing every upside opportunity the markets present, as we believe that, when it comes to achieving long-term goals, this is more critical than reaching for incremental returns. More specifically, we have repeatedly stressed our view that the majority of investors have been underestimating the likelihood of a return to what we call the “high uncertainty” regime, as well as our conclusion that equity markets have generally returned to significantly overvalued levels.

Why do you not place more emphasis on risk tolerance?

We recognized that the conventional approach to investments starts with an assessment of one’s “risk tolerance”, which is then translated into a target standard deviation of a portfolio’s return. However, after fourteen years of researching and writing about issues related to asset allocation, we have concluded that this approach vastly oversimplifies the complicated psychological processes at work in most investors’ minds. As we have written in the past, our approach is based on the neurobiology of fear, and the phenomena that trigger it in normal human beings. These include loss, heightened uncertainty, and social isolation. The latter is a

complicated concept, which includes both aversion to deviating from the herd after losses or when uncertainty is high, as well as envy, which can be viewed as fear of isolation caused by a relative lack of success in an area critical to survival and/or reproduction. Moreover, we also believe that, to some extent, one's willingness to undertake different actions in the face of fear is moderated by the circumstances one faces. For example, I ordinarily wouldn't rush into a burning building; however, knowing my child was inside would profoundly change my perspective. Similarly, we think that changing financial circumstances likely alter investor's ability to deal with fear and willingness to take risk. More broadly, we think that a deeper understanding of fear, as well as the neurobiology of reward, and the way we cognitively attend to and process information (including social inputs) will eventually result in a "sub-atomic" model of what drives the actions of investors, whose aggregate behavior produced the asset returns we observe and analyze. We also think that by helping our readers better understand these processes we can help them to significantly improve their performance as investors and advisors. We agree that this is a far cry from simply identifying an unchanging risk tolerance and using that to back into an asset allocation. However, we also believe that it is more likely to produce satisfying long-term outcomes.

February 2010 Economic Update

We assume that under normal conditions, the "base case" or "policy" asset allocations employed by our readers are sufficient to achieve their long-term goals within acceptable risk limits. Given this assumption, the main threat our readers' face is a substantial downside loss that breaches these risk limits, and substantially reduces the probability they will achieve their long-term goals. The goal of our economic updates is to provide timely warning about dangerous overvaluations that could lead to such losses in one or more asset classes. Our main focus is on what is known as "strategic warning" – "the what and the why", with a lesser focus on "operational warning" – "the how". Our objective is not to provide tactical warnings –

“who, when and where” – that are more commonly known as “trading tips” intended to increase short term returns.

Our economic analysis methodology is based on a technique known as “analysis of competing hypotheses”, or “ACH.” Human beings normally seek to collect information that supports a hypothesis. However, since a piece of information may be consistent with more than one hypothesis, this method is inefficient. In contrast, ACH focused on disproving hypotheses, and values information on this basis. For example, a piece of evidence that has a very low probability of being observed under a given hypothesis is more valuable than a piece of evidence that is consistent with multiple hypotheses.

Our economic hypotheses take the form of two alternative scenarios. When it becomes apparent that one of them is much more consistent with the accumulated evidence, we generate two new ones. 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. These scenarios are described in more detail in our previous issues, which (as you go back in time), also describe the scenarios that preceded them.

We further assume that financial market returns reflect the complex interplay between political and economic conditions, which in turn reflect the actions of key groups (i.e., networks), which in turn are comprised of individuals whose behavior is based on an evolving mix of cognitive, informational, emotional and social factors. In our analysis, we use both bottom up and top down approaches to develop our scenarios and guide our search for information that provides insight about which of them is developing.

The assumptions we make in our analyses, and the conclusions we reach, are inescapably uncertain. We believe it is extremely important for the reader 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 Druzdzal, and “What Do Words of Estimative Probability Mean?” by Kristan Wheaton). In our analyses, we are standardizing on the use of a three level verbal scale to express our confidence level in our estimates. “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.

With respect to the situation we face today, we believe three critical issues must be resolved in order for the world economy to return to a period of sustained growth and relatively normal conditions in financial markets – (1) high levels of household debt across much of the Anglosphere; (2) a deeply weakened world financial system; and (3) unsustainable structural imbalances in the economies of the United States and China, and in these countries’ current account balances. We further believe that the actions of three groups – middle class Americans, Chinese peasants, and Iranian youth, are linchpins that could have an outsized impact on the future evolution of political and economic events, and, through them, on the resolution of the three critical issues we face and future asset class returns.

The essential predicament facing the global economy is by now well known: overleveraged private sectors in the developed world have sharply cut back spending in order to repay their debts. In order to avoid the collapse in GDP that this would otherwise cause, governments have sharply increased their spending and fiscal deficits as a percentage of GDP, which in turn has boosted Debt/GDP ratios which in some cases were already uncomfortably high. This has provoked rising concern with fiscal deficits and sovereign credit risk, that has recently come to a head in Greece.

However, aggressive though it has been, government expansion has usually not fully offset private sector retrenchment, result in some reductions in the size of global current account deficits and surpluses, particularly those that exist in the United States and China. To offset the contraction caused by a fall in its exports, the latter county has embarked on a stimulus program that has been marked by extraordinary levels of credit growth, which in turn (as has been the case throughout history) has fed what many perceive to be a growing bubble in domestic property markets. Moreover, in order to maintain employment and social/political stability, China has sought to maintain its export markets and export led growth model, either because it is unwilling or unable to increase its level of domestic consumption spending. In sum, while unprecedented fiscal and monetary stimulus around the world has thus far avoided a repeat of the Great Depression, the recovery remains extremely fragile.

The first two months of the year have seen a number of interesting new developments. One was the publication of a new research report by the IMF, “After the Crisis: Lower Consumption Growth But Narrower Global Imbalances?” by Mody and Ohnsorge. The authors begin by noting that, “While the role of uncertainty is widely recognized, its empirical significance is rarely examined”. Clearly, we strongly agree with their position. Their analysis assumes that “expectation of a rise in unemployment is a useful measure of uncertainty because it proxies for the risk of a catastrophic fall in income.” The authors’ analysis reaches four conclusions about the underlying forces that are at work in the global economy. (1) “Within a country, over time, two variables show a consistently clear influence on consumption growth. An increase in unemployment over the previous year is associated with significantly lower consumption growth. And higher GDP volatility is similarly associated with a sizeable reduction in consumption growth.” (2) “Households tend to set target levels of wealth to act as buffers in bad times...When, as now, the loss of financial wealth is substantial, the effects on consumption are larger. The current drop in wealth will therefore likely have persistent effects on consumption spending.” (3) “Countries with a greater long-term tendency for financial instability increase consumption at a slower rate.” And, (4), “A country’s demographic structure matters. Where the working age

population supports more dependents, both young and old, consumption growth is lower. Thus, differences in dependency rates are another contributor to different rates of consumption growth.”

Having established the causal relationships, the authors then draw conclusions about what lies ahead. “In the short run, continued income uncertainty will significantly dampen consumption growth in the G-7 economies...As such consumption in the G-7 economies is unlikely to be the engine that revives global growth...Having averted a financial meltdown, the global economy is faced with the prospect of a halting recovery in large part because consumption growth in the richest nations is likely to remain well below the rates experienced before the crisis...However, with the US experiencing a sharper rise in unemployment and, perhaps, more widespread loss of financial wealth than elsewhere in the G-7, the rise in the US savings rate is helping to narrow global imbalances.”

The authors also note that “the same fear factor that increases the savings rate also causes households to invest their savings in low risk, low return assets. Thus, the irony is that while German and Japanese households have saved at high rates [in recent years], they have not necessarily benefited from the process by accumulating large amounts of wealth. That, in turn, has kept their consumption growth low. At the same time, low domestic consumption growth rates have implied that growth had necessarily to emanate from exports to the global economy. But exports tend to be significantly more volatile than domestic consumption...Once again, low consumption growth induces volatility in GDP growth, which reinforces the tendency towards low consumption growth.”

A further brake on growth is likely to be rising levels of debt/GDP. As Reinhart and Rogoff note in a new paper (“Growth in a Time of Debt”), when this ratio exceeds 90%, the median national growth rate in their sample was 1% lower (and the average lower still). Some countries, notably Japan, are already past that threshold; others will soon approach it if fiscal deficits continue at their current levels. Yet that seems to be inevitable if other sources of demand growth don’t develop. In the short-term, given the constraints on private consumption growth, many countries have pinned their

hopes to a rise in exports. Yet with the U.S. unable to play the role of the world's "consumer of last resort", and with China and the Eurozone either unwilling or unable to play this role, and the emerging market countries not large enough as a percentage of the global economy to play this role, it is clear that a strategy of "we're going to export our way out of this problem" isn't going to work for everyone. That leaves a rise in investment – both private and public sector – as the last alternative to the continuation of government fiscal deficits as the means of keeping global aggregate demand at an acceptable level. However, in the case of business investment, the obvious question is, "why should we invest, given the uncertainty we face today?" To be sure, regulatory changes (e.g., in the area of CO2 emissions) could stimulate some increase in investment. But, absent a reorientation of government spending programs towards a greater emphasis on investment, it seems unlikely that business investment alone will be sufficient to solve the world's aggregate demand problem.

In the last six weeks or so, many of these issues have begun to come to a head, with Greece as the most recent flashpoint. The immediate issue there has been a sharp widening in spreads (i.e., insurance premiums) on credit default swaps on the countries sovereign debt, and growing worries about its ability to rollover outstanding government debt that is coming due. The larger problem is one that goes far beyond Greece. Even before the onset of the 2008 crisis, Greece had been running significant government deficits, due to weak tax collections, the high cost of public sector payrolls, generous social spending programs, a thicket of regulations that has held down productivity growth and job creation, and increasingly uncompetitive exports due to both the rise in the value of the Euro versus other currencies (e.g., the U.S. Dollar and the Chinese Renminbi) and declining competitiveness as an exporter within the Eurozone (due to its slower productivity growth and higher inflation over the years compared to Germany). To a significant extent, this also describes the plight facing many U.S. states, most visibly including California and New York. The good news is that the latter two aren't saddled with a rising Euro. As is true in the United States, the other nations that comprise the Eurozone, and European Union more broadly, face a painful choice. A Greek default on its sovereign debt would run the risk of setting off a

contagion, raising investor uncertainty and driving interest rates far higher at a time when the Greek, Eurozone and global economies are all in a very fragile state. Yet to simply use funds from other member nations (or, in the U.S., other states, via the federal government) to bail out Greece might also raise uncertainty, in that it would send a clear signal that nations that have followed irresponsible economic policies can expect to have others pay for their negative consequences. Put differently, a bailout that does not impose very tough conditions runs the risk of sharply increasing moral hazard. To be sure, the Greek leadership responded by making all the correct statements and proposing all manner of policy changes. And that, along with somewhat comforting noises about potential transitional support from the European Union, Germany, and/or the IMF as these policies are implemented may end up getting Greece through its next few bond issues without serious carnage. But the announcement of these sharp policy changes, which will force a prolonged period of austerity and probably some degree of deflation upon the nation for many years (as both price falls and sharp productivity increases will be needed to restore the competitiveness of the Greek economy, absent a sharp fall in the Euro), also led to nationwide strikes by public sector employees, complaints from the beneficiaries of social spending programs, and, undoubtedly, a flurry of planning by those people most likely to see a sharp increase in their taxes in the next few years. This highlights the essence of the underlying issue, which we suspect is an important and growing source of rising investor uncertainty around the world. Do we really believe that the social and political systems in most Western nations can sustain a prolonged period of austerity without triggering substantial, and quite possibly (from an investor's point of view) very adverse changes in the financial and regulatory environment? How many democracies throughout history have been able to divide up a shrinking pie without substantial conflict and dramatic change? We will undoubtedly move further down this road when the Icelandic people vote on March 6th to reject the proposed Icesave settlement with the Netherlands and U.K. (which paid out billions to cover the losses of foreign depositors in Icelandic banks that went bust, and which now want Iceland to repay them). And the worsening condition of many U.S. states' budgets may soon push us

further down still. In sum, the issue that has first come to a head in Greece will not go away any time soon.

It is in this context that we have also noted a growing number of stories by writers we respect that hint at the possible passing of an important turning or tipping point. To begin with, we are seeing more and more stories about U.S. homeowners, and especially upper income homeowners, choosing to “strategically default” on their mortgages. See, for example, “US Housing Market Hit by Walkaways” by Aline van Duyn in the 22Feb10 *Financial Times*, and “Walk Away from Your Mortgage” by Roger Lowenstein in the 10Jan10 *New York Times*. We are also seeing evidence of rising popular frustration, and a widening gulf with the perceptions of the governing class. See, for example, “We’re Living in Broken Britain Say Most Voters” (*Times*, 9Feb10), which reports “nearly three fifths of voters say they hardly recognize the country they are living in, while forty two percent say they would emigrate if they could.” See also the 19Feb07 polling report from RasmussenReports.com, which found that 84% of mainstream voters reported they were angry, while 84% of the political class reported they were not; 87% of mainstream voters said Washington was broken, while 73% of the political class disagreed; and 68% of mainstream voters think neither Democratic nor Republican leaders have a good understanding of what is needed today, while 61% of the political class disagree.

Meanwhile, the intransigence of public sector unions in the face of high private sector unemployment and rapidly deteriorating state budgets is clearly rubbing more and more people the wrong way across a range of countries. For example, in the United States, a 23Feb10 Pew Research Poll found that favorability ratings for unions have fallen sharply, from 58% favorable/31% unfavorable in January 2007 to 41% favorable/42% unfavorable by January 2009. More and more commentators are noting that the conflict between public sector employees and the private sector taxpayers who pay for most of government’s cost looks likely to be a long and bitter battle.

Another much cited article, which we highly recommend, is “How a New Jobless Era Will Transform America” by Don Peck in the January issue of *The Atlantic*. He

makes it clear why pollsters are finding that job creation is now people's top concern, why high levels of joblessness are likely to persist for years, and how this will affect society in many ways for many years. As Peggy Noonan wrote in the 19Feb10 *Wall Street Journal*, "voters are feeling as never before in recent political history the vulnerability of their individual position."

Yet in the face of the many challenges we face, there is also a growing fear that governments aren't up to the task. In the United States, Evan Bayh's decision not to run again for the United States Senate seemed to crystallize this fear. As the New York Times editorialized on 17Feb10, "rarely has the political system seemed more polarized and less able to solve big problems that involve trust, tough choices and little short term gain" ("Party Gridlock in Washington Feeds New Fear of Debt Crisis"). Other stories on this same theme by respected, long-time observers of the political process include Charlie Cook's "Spinning Our Wheels" (Cook Report, 20Feb10), "Government Running to a Standstill" by Clive Crook in the 14Feb10 *Financial Times*, Dick Morris' "The New Two Party System" in the 6Jan10 edition of TheHill.com, which highlights how moderates are being forced out of both the Democratic and Republican parties, Bill Gross' observation that "government doesn't work any more" in his January PIMCO commentary, Charlie Munger's "Basically, It's Over" article published on 21Feb10 on Slate.com, and Thomas Friedman's lament, in the 21Feb10 *New York Times* ("The Fat Lady Has Sung") that the Obama administration has critically failed to provide a simple, clear narrative to tie together the myriad of reforms that will be needed to get the U.S. economy back on track.

Unfortunately, it doesn't look like the world economy is going to give political leaders much more time to get their act together. The February report from the U.S. TARP Oversight Panel painted a grim picture of the deteriorating situation in commercial property markets: "Over the next few years, a wave of commercial real estate loan failures could threaten America's already weakened financial system. The Congressional Oversight Panel is deeply concerned that commercial loan losses could jeopardize the stability of many banks, particularly the nation's mid-size and smaller banks, and that as the damage spreads beyond individual banks that it will contribute

to prolonged weakness throughout the economy.” In the U.S. residential property market, rents continue to fall, and mortgage delinquencies, defaults, and foreclosures remain serious problems, with, as previously noted, a growing number of “strategic defaults” often by affluent homeowners. In Canada, in contrast to other countries, the ratio of debt to household income has continued to climb, reaching 145%, its highest level ever (the peak in the US and UK was between 150% and 160%). In the UK, there are growing worries that, as the *Economist* noted on 11Feb10, “the recovery in British housing prices is built on sand.” Elsewhere in the *Economist*, Philip Coggan has produced an excellent series in his Buttonwood column and blog on the factors driving the growing concern with sovereign debt levels around the world. As we have noted in the past, the combination of already high debt/GDP levels, relatively short average debt maturities, unprecedented peacetime government deficits (combined in some countries with substantial off balance sheet liabilities for future social security and healthcare payments), and the prospect of lower rates of GDP growth (relative to the interest rate on outstanding debt) for years to come is a very dangerous mix. As we have repeatedly noted, in our view Australian and Canadian government debt is looking more and more like a legitimate alternative to U.S. government debt as the world’s ultimate risk free asset. Unfortunately, their capital markets are far smaller than the market for U.S. government debt, so as a practical matter, short term U.S. Treasuries and real return bonds will likely remain the world’s most popular risk free assets. Yet for individual investors, who can more easily diversify their holdings, these other countries are increasingly attractive alternatives.

We may also have reached a tipping point internationally, in terms of the way the world views China. It is clear that conflicts between China and the rest of the world have been increasing across a range of domains, including commercial (e.g., disputes with Google and Rio Tinto, as well as new rules giving preference to domestic suppliers for government technology purchases), foreign policy (sharp Chinese responses to President Obama’s meeting with the Dalai Lama and to U.S. arms sales to Taiwan, and refusal to support tough sanctions on Iran), military (China’s development of anti ship ballistic missiles that threat U.S. aircraft carrier battle groups),

trade (the imposition of an increasing number of sanctions and controls), exchange rates (China's ongoing refusal to allow substantial appreciation of the Renminbi), climate (China's obstinacy at the Copenhagen conference), and finance and economics (sharp Chinese comments about the underlying causes of the global crisis, and the need of the U.S. to sharply retrench). The cumulative impact of these growing conflicts has triggered a round of articles by writers around the world questioning the fundamental assumptions upon which relations with China have operated over the past two decades, particularly the belief that increased integration into the global economy would lead to growing Chinese support for the current international system, and liberalization of its domestic political environment. Examples of articles that question the premises upon which policy towards China has rested include, "Fear of the Dragon" in the 7Jan10 *Economist*, "The Year China Showed Its Teeth" in the 16Feb10 *Financial Times*, "The Arrogance of China's Leadership" by Erich Follath in the 23Feb10 *Spiegel*, and Robert Samuelson's "The China Miscalculation" published on 15Feb10 on RealClearPolitics.com. To be sure, there are contrary views, such as Bill Emmott's "Why China is Stoking War of Words with US" in the 8Feb10 *Times*. In Emmott's view, which is also one we have advanced over the years, increasing conflict and heightening nationalist passions may be a deliberate strategy on the part of the Chinese leadership to deflect attention from the painful social consequences of unavoidable changes in domestic policy, such as attempts to slow a rapidly growing property market bubble and accelerating inflation. The risk, obviously, is that, even if Emmott is correct about its motivations, the Chinese leadership will be unable to control either the domestic and/or the international consequences of this strategy. The articles we have just cited do not provide encouragement in this regard.

Last but not least, the past few weeks have seen a further ratcheting up of tensions between the West and Iran, with President Ahmadinejad ordering the nation's nuclear agency to begin enriching uranium, and the IAEA announcing that it has information suggesting Iran may be working to build a nuclear warhead. With China and Russia continuing to play a cat and mouse game with the West about their willingness to support economic sanctions on Iran, the chances of a military strike by

either the United States and/or Israel continue to increase, which in turn would likely trigger a sharp increase in oil prices that would choke off the current global recovery.

In sum, as we noted last month, we continue to believe that a majority of investors continue to underweight the probability of a return to a regime of high uncertainty later this year. As we have noted, asset classes that perform relatively well under this regime may still be undervalued today. These include short maturity U.S. Treasury and other government bonds, including real return bonds, volatility, gold, and some property markets (e.g., Switzerland and other European countries in which property is a traditional refuge in unsettled times). We also continue to believe that the chances that we will soon enter the high inflation regime are remote, and that in the short term deflation is far more likely. Finally, we believe that asset classes that perform best under the normal regime – specifically, all equities (including emerging market equities) and credit bonds – are probably overpriced today.

Global Asset Class Valuation Analysis

Our asset class valuation analyses are based on the belief that financial markets are complex adaptive systems, in which prices and returns emerge from the interaction of multiple rational, emotional and social processes. We further believe that while this system is attracted to equilibrium, it is generally not in this state. To put it differently, we believe it is possible for the supply of future returns a market is expected to provide to be higher or lower than the returns investors logically demand, resulting in over or underpricing relative to fundamental value. The attraction of the system to equilibrium means that, at some point, these prices are likely to reverse in the direction of fundamental value. However, the very nature of a complex adaptive system makes it hard to forecast when such reversals will occur. It is also the case that, in a constantly evolving complex adaptive system like a financial market, any estimate of fundamental value is necessarily uncertain. Yet this does not mean that valuation analyses are a fruitless exercise. Far from it. For an investor trying to achieve a multiyear goal (e.g., accumulating a certain amount of capital in advance of

retirement, and later trying to preserve the real value of that capital as one generates income from it), avoiding large downside losses is mathematically more important than reaching for the last few basis points of return. Investors who use valuation analyses to help them limit downside risk when an asset class appears to be substantially overvalued can substantially increase the probability that they will achieve their long term goals. This is the painful lesson learned by too many investors in the 2001 tech stock crash, and then learned again in the 2007-2008 crash of multiple asset classes.

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

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 fundamentals. As described in our November 2008 article “Are Emerging Market Equities Undervalued?”, people can and do disagree about the “right” values for the variables we use in our fundamental analysis. Recognizing this, we present four valuation scenarios for an equity market, based on different values for three key variables. First, we use both the current dividend yield and the dividend yield adjusted upward by .50% to reflect share repurchases. Second, we define future dividend growth to be equal to the long-term rate of total (multifactor) productivity growth. For this variable, we use two different values, 1% or 2%. Third, we also use two different values for the equity risk premium required by investors: 2.5% and 4.0%. Different combinations of all these variables yield high and low scenarios for both the future returns the market is expected to supply (dividend yield plus growth rate), and the future returns investors will demand (real bond yield plus equity risk premium). We then use the dividend discount model to combine these scenarios, to produce four different views of whether an equity market is over, under, or fairly valued today. The specific formula is $(\text{Current Dividend Yield} \times 100) \times (1 + \text{Forecast Productivity Growth})$ divided by $(\text{Current Yield on Real Return Bonds} + \text{Equity Risk Premium} - \text{Forecast Productivity Growth})$. Our valuation estimates are shown in the following tables, where a value greater than 100% implies overvaluation, and less than 100% implies undervaluation. In our view, the greater the number of scenarios that point to overvaluation or undervaluation, the greater the probability that is likely to be the case.

Equity Market Valuation Analysis at 29 Jan 10

<i>Australia</i>	Low Demanded Return	High Demanded Return
High Supplied Return	70%	103%
Low Supplied Return	105%	143%

<i>Canada</i>	Low Demanded Return	High Demanded Return
High Supplied Return	66%	116%
Low Supplied Return	121%	183%

<i>Eurozone</i>	Low Demanded Return	High Demanded Return
High Supplied Return	50%	86%
Low Supplied Return	85%	126%

<i>Japan</i>	Low Demanded Return	High Demanded Return
High Supplied Return	75%	132%
Low Supplied Return	141%	212%

<i>United Kingdom</i>	Low Demanded Return	High Demanded Return
High Supplied Return	30%	68%
Low Supplied Return	64%	107%

<i>United States</i>	Low Demanded Return	High Demanded Return
High Supplied Return	76%	137%
Low Supplied Return	149%	227%

<i>Switzerland</i>	Low Demanded Return	High Demanded Return
High Supplied Return	74%	128%
Low Supplied Return	137%	236%

<i>India</i>	Low Demanded Return	High Demanded Return
High Supplied Return	67%	164%
Low Supplied Return	200%	347%

<i>Emerging Markets</i>	Low Demanded Return	High Demanded Return
High Supplied Return	93%	192%
Low Supplied Return	139%	239%

In our view, the key point to keep in mind with respect to equity market valuations is the level of the current dividend yield (or, more broadly, the yield of dividends and buybacks), which history has shown to be the key driver of long-term real equity returns in most markets. The rise in uncertainty that accompanied the 2007-2008 crisis undoubtedly increased many investors' required risk and uncertainty premium above the long-term average, while simultaneously decreasing their long-term real growth forecasts. The net result was a fall in equity prices that caused dividend yields to increase. From the perspective of an investor with long-term risk and growth assumptions in the range we use in our model, in some regions this increase in dividend yields more than offset the simultaneous rise in real bond yields, and caused the equity market to become undervalued (using our long-term valuation assumptions). On the other hand, in a still weak economy, many companies have been cutting dividends at a pace not seen since the 1930s. Hence the numerator of our dividend/yield calculation may well further decline in the months ahead, which, all else being equal, should further depress prices. Despite this, the past few months have seen a very strong rally develop in many equity markets, which, in some cases, has caused our valuation estimates to rise into the "overvalued" region. Given the absence of progress in reducing the three main obstacles that block a return to sustainable economic growth (see our Economic Update), we believe that these rallies reflect investor herding (and the incentives of many professional investment managers to deliver positive returns on 2008's disastrous end-of-year base), rather than any improvement in the underlying fundamentals.

Real Return Bonds

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

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

Unfortunately, this rate of future growth is not guaranteed; rather, there is an element of uncertainty involved. Therefore we also need to take investors’ aversion to risk and uncertainty into account when estimating the risk free rate of return they should require in exchange for letting others use their capital for one year. There are many ways to measure this, and unsurprisingly, many people disagree on the right

approach to use. In our analysis, we have used Constant Relative Risk Aversion with an average value of three (see “How Risk Averse are Fund Managers?” by Thomas Flavin). The following table brings these factors together to determine our estimate of the risk free rate investors in different currency zones should logically demand in equilibrium (for an excellent discussion of the issues noted above, and their practical importance, see “The Stern Review of the Economics of Climate Change” by Martin Weitzman):

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

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

The next table compares this long-term equilibrium real risk free rate with the real risk free return that is currently supplied in the market. Negative spreads indicate that real 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 **29 Jan 10**.

Region	Risk Free Rate Demanded	Actual Risk Free Rate Supplied	Difference	Overvaluation (>100) or Undervaluation (<100)
Australia	2.2	2.6	0.5	95

Region	Risk Free Rate Demanded	Actual Risk Free Rate Supplied	Difference	Overvaluation (>100) or Undervaluation (<100)
Canada	2.8	1.4	-1.3	114
Eurozone	2.9	1.6	-1.3	114
Japan	2.8	1.5	-1.3	114
United Kingdom	2.8	0.7	-2.2	124
United States	2.5	1.4	-1.1	112

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

Finally, we also recognize that certain structural factors can also affect the pricing (and therefore yields) of real return bonds. For example, some have argued that in the U.K., the large number of pension plans with liabilities tied to inflation has created a permanent imbalance in the market for index-linked gilts, causing their returns to be well below those that models (such as ours) suggest should prevail. A similar set of conditions may be developing in the United States, particularly as demand for inflation hedging assets increases. Finally, valuation of real return bonds is further complicated by deflation, which affects different instruments in different ways. For example, US TIPS and French OATi adjust for inflation by changing the principal (capital) value of the bond. However, they also contain a provision that the redemption value of the bond will not fall below its face value; hence, a prolonged period of

deflation could produce significant real capital gains (this is known as the “deflation put”). In light of these considerations, we have a neutral view on the valuation of real return bonds in all currency zones.

Government 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 29 Jan 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 Inflation Rate over 10 year time horizon = $(1+Nom)/(1+Real)-1$
Australia	2.64%	2.96%	5.60%	5.43%	-0.17%	1.58%	2.72%
Canada	1.44%	2.40%	3.84%	3.35%	-0.49%	4.87%	1.88%
Eurozone	1.59%	2.37%	3.96%	3.18%	-0.78%	7.85%	1.56%
Japan	1.49%	0.77%	2.26%	1.33%	-0.93%	9.57%	-0.16%
UK	0.69%	3.17%	3.86%	3.91%	0.05%	-0.51%	3.20%
USA	1.36%	2.93%	4.29%	3.59%	-0.70%	6.99%	2.20%
Switz.	1.54%	2.03%	3.57%	2.00%	-1.57%	16.45%	0.46%

	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 Inflation Rate over 10 year time horizon = $(1+Nom)/(1+Real)-1$
India	1.54%	7.57%	9.11%	7.59%	-1.52%	15.04%	5.96%

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

It is important to note some important limitations of this analysis. Our bond market analysis uses historical inflation as an estimate of expected future inflation over the long-term. This may not produce an accurate valuation estimate, if the historical average level of inflation is not a good predictor of future average inflation levels. This is especially true today, when the world economy is operating in uncharted waters, and is facing both potential deflationary pressures (from falling demand relative to productive capacity, and significant debt servicing problems in the private sector) and inflationary pressures (from unprecedented peacetime government deficits, that are largely being financed by central banks under the “quantitative easing” programs). Under these circumstances, one could argue that many nominal return government bonds might in fact be underpriced today, over a shorter time horizon (more likely to experience deflation), while overpriced over a longer time horizon (that is more likely to see higher levels of inflation). As we like to point out, in the absence of public policy interventions, overindebtedness on the part of private borrowers typically results in widespread bankruptcies and deflation caused by the accelerating liquidation of collateral. In contrast, overindebtedness on the part of governments more often results in some combination of inflation and exchange rate depreciation (e.g., look at the history of Argentina).

To help readers to put the current situation in perspective, we also include in the table above the average annual inflation rate implied by the current spread between ten year nominal rates and average real rates (note that research has shown that the real yield curve tends to be quite flat, which is consistent with economic

theory). The following table, shows historical average inflation rates (and their standard deviations) for the U.K. and U.S. over longer periods of time, and helps to put our government bond valuation analysis (and inflation assumptions) into a broader context:

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

In sum, assuming inflation levels revert to their long-term averages over a long time horizon, many government bond markets appear overpriced today (i.e., prevailing nominal yields appear to be too low). However, over a short-term time horizon, during which inflation should either be low or negative (i.e., during which we may actually experience a prolonged period of deflation), one can make the case that many government bond markets are significantly undervalued today. When it comes to questions about valuation, one's time horizon assumption is critical.

Credit Spreads

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

demand growth, with a rise in spreads signaling a future fall in demand (see “Credit Market Shocks and Economic Fluctuations” by Gilchrist, Yankov, and Zakrajsek).

The following table shows the statistics of the distribution of these spreads between January, 1986 and December, 2008 (based on daily Federal Reserve data – 11,642 data points). Particularly in the case of the BAA spread, it is clear we are not dealing with a normal distribution!

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

At **29 Jan 10**, the AAA minus 10 year Treasury spread was 1.65%. The AAA minus BAA spread was .96%. Since these distributions are not normal (i.e., they do not have a “bell curve” shape), we take a different approach to were been only 877 days with a higher AAA spread (7.5% of all days) and 2,073 days with a higher BAA spread (17.8% of all days in our sample). Current spreads still reflect relatively a high degree of investor uncertainty about future liquidity and credit risk, despite the declines in the BBB and AAA spreads from their crisis highs. However, given the uncharted economic waters through which we are still passing, and our belief that the conventional wisdom underestimates the amount of trouble on the horizon, we believe that these spread possibly reflect the underpricing of liquidity and credit risk – or, to put it differently, the overpricing of AAA and BBB rated bonds – on a one year time horizon. We particularly note that over the past month, the liquidity risk spread has increased, while the credit risk spread has fallen, which strikes us another indicator that credit risk is still underpriced.

Over a longer term time horizon, where risk premiums return to more normal levels, one can argue that credit is underpriced today, based on prevailing yields. However, the validity of that conclusion also critically depends on one’s assumptions

about future default rates and loss rates conditional upon default. A decision to buy 50,000 in bonds at what appears to be a very attractive yield from a long-term perspective can still generate negative total returns if the future default rate (and losses conditional upon default) more than wipes out the apparently attractive extra yield. And since the differences between current AAA and BBB credit spreads and their long-term averages are well under 100 basis points today, it doesn't take much mis-estimation of future default rates (and losses conditional on default) to turn today's apparently good decision into tomorrow's painful outcome. And the "historically attractive yields" argument gets (non-linearly) less convincing the further down the credit ratings ladder you go. On balance, we think that even on a long-term view, credit is at best fully valued today, and quite possibly overpriced, given the uncertain economic outlook and difficulty in accurately estimating future default and loss given default rates.

Currencies

Let us now turn to currency prices and valuations. For an investor contemplating the purchase of foreign bonds or equities, the expected future annual percentage change in the exchange rate is also important. Study after study has shown that there is no reliable way to forecast this, particularly in the short term. At best, you can make an estimate that is justified in theory, knowing that in practice it will not turn out to be accurate, especially over short periods of time (for a logical approach 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 29 Jan 10

	To AUD	To CAD	To EUR	To JPY	To GBP	To USD	To CHF	To INR
From								
AUD	0.00%	-2.08%	-2.25%	-4.10%	-1.52%	-1.84%	-3.43%	2.16%
CAD	2.08%	0.00%	-0.17%	-2.02%	0.56%	0.24%	-1.35%	4.24%
EUR	2.25%	0.17%	0.00%	-1.85%	0.73%	0.41%	-1.18%	4.41%
JPY	4.10%	2.02%	1.85%	0.00%	2.58%	2.26%	0.67%	6.26%
GBP	1.52%	-0.56%	-0.73%	-2.58%	0.00%	-0.32%	-1.91%	3.68%
USD	1.84%	-0.24%	-0.41%	-2.26%	0.32%	0.00%	-1.59%	4.00%
CHF	3.43%	1.35%	1.18%	-0.67%	1.91%	1.59%	0.00%	5.59%
INR	-2.16%	-4.24%	-4.41%	-6.26%	-3.68%	-4.00%	-5.59%	0.00%

Commercial Property

Our approach to valuing commercial property securities as an asset class is also based on the expected supply of and demand for returns, utilizing the same mix of fundamental and investor behavior factors we use in our approach to equity valuation. Similar to equities, the supply of returns equals the current dividend yield on an index covering publicly traded commercial property securities, plus the expected real growth rate of net operating income (NOI). A number of studies have found that real NOI growth has been basically flat over long periods of time (with apartments showing the strongest rates of real growth). This is in line with what economic theory

predicts, with increases in real rent lead to an increase in property supply, which eventually causes real rents to fall. However, it is entirely possible – as we have seen in recent months – that rents can fall sharply over the short term during an economic downturn.

Our analysis also assumes that over the long-term, investors require a 3.0% risk premium above the yield on real return bonds as compensation for bearing the risk of securitized commercial property as an asset class. Last but not least, there is significant research evidence that commercial property markets are frequently out of equilibrium, due to slow adjustment processes as well as the interaction between fundamental factors and investors' emotions (see, for example, "Investor Rationality: An Analysis of NCREIF Commercial Property Data" by Hendershott and MacGregor; "Real Estate Market Fundamentals and Asset Pricing" by Sivitanides, Torto, and Wheaton; "Expected Returns and Expected Growth in Rents of Commercial Real Estate" by Plazzi, Torous, and Valkanov; and "Commercial Real Estate Valuation: Fundamentals versus Investor Sentiment" by Clayton, Ling, and Naranjo). Hence, it is extremely hard to forecast how long it will take for any over or undervaluations we identify to be reversed. The following table shows the results of our valuation analysis as of **29 Jan 10**: We use the dividend discount model approach to produce our estimate of whether a property market is over, under, or fairly priced today, assuming a long-term perspective on property market valuation drivers. The specific formula is $(\text{Current Dividend Yield} \times 100) \times (1 + \text{Forecast NOI Growth})$ divided by $(\text{Current Yield on Real Return Bonds} + \text{Property Risk Premium} - \text{Forecast NOI Growth})$. Our estimates are shown in the following tables, where a value greater than 100% implies overpricing, and less than 100% implies underpricing.

Country	Dividend Yield	Plus LT Real Growth Rate	Equals Supply of Returns	Real Bond Yield	Plus LT Comm Prop Risk Premium	Equals Returns Demanded	Over or Undervaluation (100% = Fair Value)
Australia	5.9%	0.2%	6.1%	2.6%	3.0%	5.6%	93%
Canada	5.0%	0.2%	5.2%	1.4%	3.0%	4.4%	85%
Eurozone	5.7%	0.2%	5.9%	1.6%	3.0%	4.6%	77%

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)
Japan	10.2%	0.2%	10.4%	1.5%	3.0%	4.5%	42%
Switzerland*	3.7%	0.2%	3.9%	1.5%	3.0%	4.5%	119%
U.K.	4.5%	0.2%	4.7%	0.7%	3.0%	3.7%	78%
U.S.A.	5.4%	0.2%	5.6%	1.4%	3.0%	4.4%	77%

**Using the current dividend yield, the valuation of the Swiss property market appears to be significantly out of line with the others. Hence, our analysis is based on the estimated income yield on directly owned commercial property in Switzerland instead of the dividend yield on publicly traded property securities.*

As you can see, on a long-term view, a number of commercial property markets still look underpriced today, despite the sharp recent increase in property share prices in many countries. Over the next twelve months, however, we believe the balance of risks points in the other direction. Consumer spending remains weak in many markets, occupancy rates are declining, rents are stagnant at best, and landlords continue to struggle with debt refinancings (indeed, the press is full of stories about the declining quality of commercial mortgage backed securities). It is hard to see how government fiscal stimulus, strong though it is, will improve this situation very much, as long as the underlying problems – high consumer leverage, a weak financial system, and continuing international imbalances – remain unresolved. Moreover, the development of real return bond and commodity markets has weakened, to some extent, property's traditional attraction as an inflation hedge. In sum, we believe that the recent sharp run up in property security prices is yet another sign of some combination of investor over-optimism about the speed and size of economic recovery, and/or the tendency of institutional investors to herd rather than risk losing assets (or their jobs) due to their underperforming an asset class benchmark. The exception to our general view may come in Switzerland and the Eurozone, where rising insecurity often triggers an increased allocation to property, on the basis of traditional wealth preservation principles.

Commodities

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

to equities. This is consistent with the history of equities, where realized ex-post premiums have been shown to be larger than the ex-ante premiums investors should logically have expected.

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

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

so-called “Theory of Storage”: begins with the observation that, all else being equal, contango should be the normal state of affairs, since a person buying a commodity at spot today and wishing to lock in a profit by selling a futures contract will have to incur storage and financing costs. In addition to his or her profit margin, storage and financing costs should cause the futures price to be higher than the spot price, and normal roll yields to be negative.

However, in the real world, all things are not equal. For example, some commodities are very difficult or expensive to store; others have very high costs if you run out of them (e.g., because of rapidly rising demand relative to supply, or a potential disruption of supply). For these commodities, there may be a significant option value to holding the physical product (the Theory of Storage refers to this option value as the “convenience yield”). If this option value is sufficiently high, spot prices may be bid up above futures prices, causing “backwardation” and positive roll-yields for commodity index funds. Hence, a key question is the extent to which different commodities within a given commodity index tend to be in backwardation or contango over time. Historically, most commodities have spent time in both states. However, contango has generally been more common, but not equally so for all commodities. For example, oil has spent relatively more time in backwardation, as have copper, sugar, soybean meal and lean hogs. This highlights a key point about commodity futures index funds – because of the critical impact of the commodities they include, the weights they give them, and their rebalancing and rolling strategies, they are, in effect, uncorrelated alpha strategies. Moreover, because of changing supply and demand conditions in many commodities (e.g., global demand has been growing, while marginal supplies are more expensive to develop and generally have long lead times), 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 **29 Jan 10**:

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

Given the continued presence of so many contangoed futures curves, expected near term roll returns on the DJAIG as a whole are still negative, absent major supply side shocks. That said, on a weighted basis, the forward premium (relative to the spot price) has risen slightly, to .94%, up from .90% last month, but below 1.23% two months ago, and 1.60% three months ago. Finally, we also note that when futures are contangoed, commodity funds that can take short as well as long positions may still deliver positive returns.

The third source of commodity futures return is unexpected changes in the price of the commodity during the term of the futures contract. It is important to stress that the market's consensus about the expected change in the spot price is already included in the futures price. The source of return we are referring to here is the unexpected portion of the actual change. This return driver probably offers investors the best chance of making profitable forecasts, since most human beings find it extremely difficult to accurately understand situations where cause and effect are significantly separated in time (e.g., failure to recognize how fast rising house prices would – albeit with a time delay – trigger an enormous increase in new supply).

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

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

So, to sum up, the expected supply of returns from a commodity index fund over a given period of time equals (1) the current yield on real return bonds, reduced by the percentage of funds used to purchase the futures contracts; (2) expected roll yields, adjusted for commodities' respective weights in the index; (3) unexpected spot price changes; and (4) the expected rebalancing return. Of these, the yield on real return bonds can be observed, and we can conservatively assume a long-term rebalancing return of, for example, 1.0%. These two sources of return are clearly less than the demand for returns that are equal to the real rate plus a risk premium of, say, 3.0%. The difference must be made up by a combination of roll returns (which, given the current shape of futures curves, are likely to be negative in the near term) and unexpected price changes, due to sudden changes in demand (where downside surprises currently seem more likely than upside surprises) and/or supply (where the best chance of a positive return driver seems to be incomplete investor recognition of slowing oil production from large reservoirs and/or the medium term impact of the current sharp cutback in E&P and refining investments).

Another approach to assessing the valuation of commodities as an asset class is to compare the current value of the DJAIG Index to its long-term average. Between 1991 and 2008, the inflation adjusted (i.e., real) DJAIG had an average value of 91.61, with a standard deviation of 16.0 (skewness of .52, and kurtosis of -.13 – i.e., it was close to normal). The inflation adjusted **29 Jan 10** closing value of 81.42 was .67 standard deviations below the long term average. Assuming the value of the index is normally distributed around its historical average (which in this case is approximately correct), a value within one standard deviation of the average should occur about 67% of the time, and a value within two standard deviations 95% of the time. Whether the current level of the inflation adjusted DJAIG signifies that commodities are undervalued depends upon one's outlook for future roll returns and price surprises, and, critically, the time horizon being used.

There are three arguments that, on a medium term view, commodities are underpriced today. The first is the large amount of monetary easing underway in the world, which, at some point, could lead to higher inflation. The second is the equally large amount of fiscal stimulus being applied to the global economy, with its focus on infrastructure projects, should eventually boost demand for commodities (and indirectly boost economic growth in commodity exporting countries like Australia and Canada). The third is that the possibility that we will see a substantial fall in the value of the US Dollar versus other currencies, causing investors to increase their holdings of commodities as confidence in fiat currencies wanes. The argument that commodities are overvalued today on a medium term view is based on the belief that (a) investment in clean fuels and other changes in environmental regulation will cause a permanent reduction in global demand for oil relative to supply; (b) the inability to quickly resolve the economic challenges facing the world economy will result in a prolonged period of weak or no growth, which will reduce the demand for commodities; and (c) that in scenario of prolonged global stagnation, investors will prefer to increase their holdings of short term government bonds, and perhaps gold, rather than increasing their holdings of a broader range of commodities. Taking all of these arguments into consideration, the valuation question comes down to the probabilities one attaches to

a decline in global demand from today's relatively weak levels (which would cause commodities prices to fall) and the development of a crisis of confidence in the U.S. dollar (which would cause commodities prices to rise). On balance, we believe that the former is more likely than the latter, as the High Uncertainty Regime typically sees a flight into U.S. dollars rather than a flow out of them. On that basis, we conclude that commodities are possibly overvalued today.

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

Timber

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

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

timberland investing (the NCREIF Index in North America, and IPD Index in Europe) are regional in coverage and utilize an appraisal based valuation methodology based on timber limited partnerships, which tends to understate the volatility of returns and their correlation with other asset classes. Given these challenges, the result of any valuation estimate for timber as a global asset class must be regarded as, at best, a rough approximation.

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

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

In broad terms, the rate of dividend growth results from the interaction of physical, economic, and regulatory processes. Physically, trees grow, adding a certain amount of mass each year. The exact rate depends on the mix of trees (e.g., southern pine grows much faster than northern hardwoods), on silviculture techniques employed (e.g., fertilization, thinning, etc.), and weather and other natural factors (e.g.,

fires, drought, and beetle invasions). Another aspect of the physical process is that a certain number of trees are harvested each year, and sold to provide revenue to the timber REIT. A third aspect of the physical process is that trees are exposed to certain risks, such as fire, drought, or disease (e.g., the mountain pine beetle in the northwest United States and Canada). And fourth physical process is that, through photosynthesis, trees sequester a portion of the carbon dioxide that would otherwise be added to the earth's atmosphere.

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

The third set of economic processes that affects the growth rate of dividends includes changes in a timber REIT's cost structure, and in its non-timber related revenue streams (e.g., proceeds from selling timber land for real estate development or conservation easements). For example, if wood prices decline, and non-timber sources of revenue dry up (as is happening during the current recession), a timber REIT (or timber LP) will have to either cut operating costs and/or distributions to investors, or increase the physical volume of trees that are harvested.

Regulatory processes also affect the future growth rate for timber REIT dividends. In the past, the most important of these included restrictions on harvesting or land development. In the future, the most important regulatory factor is likely to be the imposition of carbon taxes or a cap and trade systems to limit carbon emissions. These new environmental regulations could provide an additional source of revenue for timber REITs in the future (for an early attempt at establishing the CO2 sequestration value of timberland, see "Economic Valuation of Forest Ecosystem Services" by Chiabai, 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.

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

This leaves the question of the appropriate return premium that investors should demand to compensate them for bearing the risk of investing in timber as an asset class. Historically, the difference between returns on the NCRIEF timberland index and those on real return bonds has averaged around six percent. However, since the timber REITS are much more liquid than the properties included in the NCRIEF index, and since timber has displayed a very low correlation with returns on other asset classes (particularly during the worst of the 2008 crisis, even in the case of liquid timber vehicles), we use three percent as the required return premium for

investing in liquid timberland assets. Arguably, because at least part of timber's return generating process (physical growth) has zero correlation with the return generating processes for other asset classes, we should use an even lower risk premium. Again, we believe our approach is conservative in this regard. Given these assumptions, our assessment of the valuation of the timber asset class at **29 Jan 10** is shown in the following table. We use the dividend discount model approach to produce our estimate of whether timber is over, under, or fairly valued today. The specific formula is $(\text{Current Dividend Yield} \times 100) \times (1 + \text{Forecast Dividend Growth})$ divided by $(\text{Current Yield on Real Return Bonds} + \text{Timber Risk Premium} - \text{Forecast Dividend Growth})$. A value greater than 100% implies overvaluation, and less than 100% implies undervaluation.

Average Dividend Yield (70% PCL + 30% RYN)	4.55%
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	<u>5.55%</u>
Real Bond Yield	1.36%
Plus Risk Premium for Timber	3.00%
Equals Average Annual Real Return Demanded	<u>4.36%</u>
Ratio of Returns Demanded/Returns Supplied Equals Valuation Ratio (less than 100% implies undervaluation)	<u>73%</u>

We stress that this is a long-term valuation estimate that contains a higher degree of uncertainty than valuation estimates for larger and more liquid asset classes. Over a one-year time horizon, you could easily reach a different valuation conclusion. For example, if you believe that real timber prices will decline over the next year, and/or

that physical harvesting rates will increase to cover costs and dividends, then you could argue that, in so far as PCL and RYN are roughly accurate proxies for the asset class as a whole, timber, as proxied by PCL and RYN, is likely overpriced today. On the other hand, whether looking over a short or long-term time horizon, if you believe that future revenues from timber's CO2 sequestration service are likely to be significant, and/or that four percent is too high a risk premium to use, then you could argue that timber is actually underpriced today.

In sum, timber valuation is an issue upon which reasonable people can and do disagree, in no small measure because of their different time horizons and the different underlying assumptions and methodologies they use to reach their conclusions. On balance, taking a long-term view, we continue to believe that timberland is likely underpriced today, for three reasons: (1) future revenue growth related to CO2 sequestration is likely to be significant; (2) the negative impact on timber prices caused by the recession and long-term slowdown in North American housing construction will be moderated or offset by the impact of supply side changes, such as the mountain pine beetle problem, and by rising demand for wood products that will accompany rising incomes in China. On a one-year view, however, we are neutral, with downward timber price risk (due to continuing economic weakness) balanced against the upside potential inherent in pending environmental legislation.

Volatility

Our approach to assessing the current value of equity market volatility (as measured by the VIX index, which tracks the level of S&P 500 Index volatility implied by the current pricing of put and call options on this index) is similar to our approach to commodities. Between January 2, 1990 and December 30, 2008, the average daily value of the VIX Index was 19.70, with a standard deviation of 7.88 (skewness 2.28, kurtosis 9.71 – i.e., a very “non-normal” distribution). On **29 Jan 10**, the VIX closed at 24.62, To put this in perspective, 19% of the days in our sample had higher closing values of the VIX. We continue to believe that, in the short term – say, over the next

12 months – this may prove to be too low, if investors' expectations that the normal regime will continue eventually meet with disappointment as the conflict scenario and/or a worsening global influenza pandemic develops. As we noted above with respect to commodities, despite the likely impact of fiscal stimulus on aggregate demand, and monetary growth on price levels (i.e., reducing the risk of prolonged deflation), the core issues that lie at the heart of the current recession remain unresolved. We have also noted in this month's journal that the probability of a return to the high uncertainty regime is rising. Critically, we do not believe that this information and its likely impact on future uncertainty levels has been fully incorporated into S&P 500 option prices, and hence into the VIX. For these reasons as of **29 Jan 10** we estimate that volatility is probably underpriced over a short-term time horizon. However, over a longer-term time horizon, volatility is possibly overpriced today. We hesitate to take a stronger stance on this issue, because we believe that structural changes – such as electronic trading, faster dispersal of information to investors, and the substantial amount of money committed to various quantitative trading strategies -- may well have made equity prices permanently more volatile than they have been in the past.

Sector and Style Rotation Watch

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

Current economic conditions affect the current cash flow an asset produces. Future economic conditions affect future cash flows and discount rates. Because they

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

We publish this table to make an important point: there is nothing unique about the various rotation strategies we describe, which are widely known by many investors. Rather, whatever active management returns (also known as "alpha") they are able to generate is directly related to how accurately (and consistently) one can forecast the turning points in the economic cycle. Regularly getting this right is beyond the skills of most investors. In other words, most of us are better off just getting our asset allocations right, rather than trying to earn extra returns by accurately forecasting the ups and downs of different sub-segments of the U.S. equity and debt markets (for three good papers on rotation strategies, see "Sector Rotation Over Business Cycles" by Stangl, Jacobsen and Visaltanachoti; "Can Exchange Traded Funds Be Used to Exploit Industry Momentum?" by Swinkels and Tjong-A-Tjoe; and "Mutual Fund Industry Selection and Persistence" by Busse and Tong).

That being said, the highest rolling three month returns in the table do provide us with a rough indication of how investors expect the economy and interest rates to perform in the near future. *The highest returns in a given row indicate that a plurality of investors (as measured by the value of the assets they manage) are anticipating the economic and interest rate conditions noted at the top of the next column* (e.g., if long maturity bonds have the highest year to date returns, a plurality of bond investor opinion expects rates to fall in the near future). Comparing returns across strategies provides a rough indication of the extent of agreement (or disagreement) investors about the most likely upcoming changes in the state of the economy. When the rolling

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

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

*Rolling 3 Month
Returns Through*

29 Jan 10

<i>Economy</i>	Bottoming	Strengthening	Peaking	Weakening
<i>Interest Rates</i>	Falling	Bottom	Rising	Peak
<i>Style and Size Rotation</i>	Small Growth (DSG) 7.93%	Small Value (DSV) 8.52%	Large Value (ELV) 4.12%	Large Growth (ELG) 5.32%
<i>Sector Rotation</i>	Cyclicals (RXI) 5.31%	Industrials (EXI) 5.51%	Staples (KXI) 3.10%	Utilities (JXI) 2.67%

Rolling 3 Month
Returns Through

29 Jan 10

Economy	Bottoming	Strengthening	Peaking	Weakening
Interest Rates	Falling	Bottom	Rising	Peak
Bond Market Rotation	Higher Risk (HYG) 3.47%	Short Maturity (SHY) 0.54%	Low Risk (TIP) 2.18%	Long Maturity (TLT) -2.65%

Norway Debates Factor Based Allocation and Active vs. Passive Investing

Over the past fourteen years, we have focused our writing on two critical investment issues: strategic asset allocation and the merits of its implementation via passive and active approaches. The past two months have seen the publication of an excellent summary of the current state of the latter debate, thanks to the Government of Norway's decision to evaluate the active management performance of its sovereign wealth fund.

Before summarizing the highlights of this analysis, we will briefly summarize where we stand in the active versus passive debate. Our starting point is the definition of the passive portfolio. In our view, this must be the portfolio that all investors could theoretically hold if they chose to do so. Only one portfolio in a given asset class meets that test: one in which individual assets are weighted by their respective market capitalizations. To be sure, market capitalization weighting is rightfully the subject of a number of criticisms. For example, the basic premise of Bob Arnott's "Fundamental Indexing" approach is that the market capitalization approach overweights assets whose current value reflects excessive investor optimism, and underweights assets whose current value reflects excessive investor pessimism. However, as we have noted in the past, if all investors adopted Bob's views, the Fundamentally Indexed portfolio would become the market capitalization weighted portfolio. A similar result would occur if every investor decided to employ equal weighting.

In our view, this leads to the most basic distinction between passive and active management. All investors can simultaneously and passively hold only one portfolio: the market capitalization weighted portfolio. When an investor's holdings deviate from the market cap weighted portfolio, he or she is, by definition, engaged in active investing.

Logically, an investor would only deviate from the market cap weighted portfolio under two circumstances: (1) if he or she had different preferences than the average investor (i.e., was willing to accept less than average return in exchange for less than average risk, or more than average return with more than average risk); and/or (2) if he or she believed that at least some assets (either across or within asset classes) were over or undervalued. And on what basis would an investor logically reach this valuation conclusion? We think of this in terms of a 2 x 2 matrix: An active investor must believe he or she has some combination of (a) superior information, and/or (b) a superior model for making sense of widely available or superior (private) information about (c) the fundamental value of one or more assets, and/or (d) the future behavior of other investors.

To make this distinction more clear, let's use two examples. In the first case, an active investor with very predictable future liabilities may be able to earn higher returns than the market capitalization weighted portfolio by investing in relatively illiquid assets, if a majority of investors, faced with less certain future liabilities, prefer to invest in highly liquid assets. Assuming an imbalance between the supply of illiquid assets issuers wish to provide, and investors' demand for them, the expected return on illiquid assets will have to increase above the return on the market capitalization weighted portfolio to clear the market. In this case, an investor whose liability structure allows greater than average investment in illiquid assets can earn a return above the return on the market capitalization weighted portfolio. Here superior returns result not from any inefficiency in asset pricing, but rather from the interaction between investor and issuer preferences. Now consider what happened to this investor in 2008, when the price of illiquid assets collapsed, as firms which bought them using debt were forced to sell them off to reduce their leverage. It is likely that his or her portfolio

returns were below the returns on the market cap weighted portfolio. But this reflected not the absence of skill, but rather one possible consequence of this investor's preferences (and, indeed, if those preferences remained unchanged, and the investor purchased more illiquid assets at very low prices, his or her future returns might well be even further above the returns on the market cap portfolio than they had been in the past).

Now consider a very different case. It is May 2007, and an active investor has either superior information and/or a superior model that leads her to conclude that over the next two years, a credit crisis is likely to cause a sharp rise in the demand for the most liquid assets like short term U.S. Treasuries. As a result, she overweights Treasuries, relative to their weight in the market cap-based portfolio, and underweights more illiquid assets, hoping to earn a superior return (relative to the market cap weighted portfolio) when her forecast proves to be true. Of course, the critical caveat in this example is that the cost of implementing her forecast (e.g., commissions, the bid/ask spread, the price impact of her trades, and whatever she pays for information and modeling) cannot exceed our active investor's expected profit if her forecast is correct.

So, to sum up: an active investor can earn a return that is greater or lesser than the return on the market capitalization weighted portfolio either by having preferences that differ from the average, or by making accurate (or inaccurate) forecasts and spending less to make and implement them than their expected profit.

So far, so good. Let us now go on a short-detour into "terminology land". In our example, the difference between the return on an active investor's portfolio and the return on the market capitalization weighted portfolio (also known as the "benchmark portfolio") is called the "active return." If, instead of simple subtraction we compare the active investors' returns to the benchmark return using linear regression ($y=bx+a$), we end up with two measures: the active portfolio's "beta" versus the market portfolio (i.e., the change in return on the former produced by a 1% change in the return on the latter), and the active portfolio's "alpha" (i.e., the y-intercept in the regression, which is taken to represent the portion of the active portfolio's return that is not due to changes

in the return on the market portfolio). In terminology land, both “active return” and “alpha” are taken as indications of our active manager’s skill. Of course, as we have seen in our examples, this is not, strictly speaking, a correct interpretation. Higher than benchmark returns can also result from having preferences that differ from those of the majority of investors, even in the absence of any superior forecast about asset valuation or investor behavior. Finally, active return and alpha both neglect to take risk into account. This flaw is corrected by another measure, the “Information Ratio” (“IR”) which relates average alpha over some period to the standard deviation of alpha (which is also known as “Tracking Error” relative to the benchmark). Using this approach, higher IRs are said to signify the presence of greater active investor skill. However, the assertion that skill is present isn’t the same thing as statistically significant evidence thereof. To cut through the math, the shorter the performance track record you have to work with, the higher the IR has to be before you can be statistically confident (i.e., 95% confident) that the active manager in question is, indeed, skilled. For example, with five years of data, you would need an IR of at least .89 to be statistically confident that a manager was skilled. Unfortunately, typical IRs for allegedly skilled active managers are usually much lower than this. For an IR of .35, you would need 32 years of data to meet the statistical significance test. And don’t forget that this measure still doesn’t tell you whether the positive IR came from simply having different preferences or from having the skill to make superior forecasts.

Let’s leave terminology land, and return to the issue of how active investors make superior forecasts of an asset’s future return. Whether consciously or not, all forecasting methods relate changes in the value of one or more independent variables to changes in the value of a dependent variable (e.g., the future return on a given asset). The relationships between the independent and dependent variable can range from very simple (“Y tomorrow equals twice the value of X today”) to much more complex formulations (e.g., involving multiple time lags, autoregression, non-linear relationships, multiple independent variables, etc.). This raises the question of where, exactly, do these equations come from?

Once again, this is an issue we have written about quite frequently over the past fourteen years. One approach to the identification of the independent variables to use is called “Principal Components Analysis”, or PCA. This technique decomposes the returns on a large set of assets (e.g., we have frequently used the returns on different asset classes, while other analysts use the returns within a single asset class) into an equation based on (a) a number of different factors (“principal components”), (b) the returns on each factor (which are also called factor premiums, when the factors are interpreted to be different sources of risk), and (c) the correlations between the return on a given asset and the return on each factor. The advantage of PCA is that, by definition, the factors this methodology extracts from a series of asset returns are statistically independent – i.e., the return on each factor is unaffected by the return on the other factors. The disadvantage of PCA is that the factors themselves are statistical constructions and not “real world” variables (e.g., economic variables like changes in real GDP, interest rates, inflation, or unemployment, or financial market variables like the return on “value stocks” – however one defines it, less the return on “growth stocks”). The art in PCA lies in relating real world variables to the statistical factors identified by the PCA methodology. We highlighted this issue in 2009 in our extended series on the existence of multiple regimes in asset class returns. In that same series, we also noted another limitation of PCA, and factor based forecasting techniques more broadly: neither the correlation of asset class returns with changes in the value of different factors, nor the return premiums on those factors, are stable over time. The painful example that occurred across multiple functional currencies was that the positive and negative weighting of most asset class returns on what we termed the “uncertainty factor” was much lower between 1990 and 2006 than it was in 2007 - 2008. To put it differently, in trying to explain returns on a given asset class in these two periods, we found very different weightings on the uncertainty factor. Looking forward, this raises the question of which weighting one should use in trying to forecast future returns? In this case, explaining the past is clearly easier than predicting the future. Our answer to this challenge has been the use of a forecasting model based on multiple regimes. But our forecasting approach is just one of many that an active

investor could employ. And this brings us to a central point in the latest chapter of the active versus passive debate.

In the first example we used above, we defined active returns (and alpha) as resulting from a deviation from the asset weightings found in the market capitalization weighted portfolio, which served as our benchmark. We also saw how the returns on a given asset can be decomposed into the returns (or premiums) on a group of independent variables, or factors. Over time, there has been a trend in financial markets towards creating indexes that mimic these factors, and selling financial products that track returns on these indexes. To cite an example, the return on a given asset might be expressed as a function of the return on a global equity market ETF, the return on a global sector or subsector ETF, the return on a regional or country EFT, the return on a growth or value ETF, the return on a small cap ETF, and a residual return reflecting the idiosyncratic risk that was unique to the company that issued the security. In the same way, the return of an active manager that held only this asset in her portfolio could be described in terms of these factors plus the “alpha” that reflected exposure to company specific risks. And this highlights a key point: from one perspective, any deviation from the return on the truly passive, broad market capitalization based portfolio represents active return or alpha. However, given that active investment managers charge much more for their services than do providers of index-based products, over time the definition of active returns and alpha has been successively narrowed, as more and more return driving factors have been discovered and made into investable index products. From an active manager’s perspective, this trend has undoubtedly made their business increasingly more difficult over the past twenty five years. Conversely, it has undoubtedly made the indexing business far more lucrative. In fact, this trend towards more and more “factor index” products (also known, confusingly, as “alternative beta”, “sub-beta”, or “exotic beta” products) shows no sign of abating. Most recently, we have seen a growing interest in the development of new factor products based on long/short methodologies – e.g., a product that goes long value stocks and short growth stocks to generate a “value premium”, and similar products to capture size and momentum premiums. Some have even gone so far to

describe portfolios as composed not of allocations to different asset classes, but rather as allocations to different factor risk premiums (which are assumed to be constant under equilibrium conditions) that are implemented by investing in different assets (whose exposure to said factors are also assumed to be constant under equilibrium conditions).

However, we fear that the cumulative impact of all these trends has been to sow ever more confusion in the minds of investors, whether they are investing their own funds or acting as stewards of other people's money. Regardless of the number of index products that are available in the market, an investor cannot escape the logic that any deviation from the market capitalization portfolio represents an active management decision that must be made in light of an investor's goals, time horizon, performance metrics, constraints, and capabilities. In some cases, a decision to deviate from market cap weights will reflect preferences that are different from those of the average investor. In other cases, a decision to deviate will reflect predictions that result in different asset weights than those contained in the market capitalization based portfolio, whether that involves higher exposure to a recognized "factor index" and/or to the securities of a single company. The real challenge, we believe, is for investors (and their advisors) to make their active versus passive management decisions with their eyes wide open. These include decisions about the broad asset classes to include in their "investable universe", the policy weights to assign them, whether and how to take active decisions regarding investable factor exposures (which we have, in the past, called "tilts") within different asset classes, whether to employ active management beyond these factor exposures (i.e., true "security selection") and whether and how to rebalance one's positions over time as circumstances change.

All of the issues we have just discussed have come to a head over the past two months in the Government of Norway's decision to evaluate the active management performance of its sovereign wealth fund ("the Norwegian Government Pension Fund – Global") that is managed by a department of the central bank, Norges Bank Investment Management (NBIM). A key part of this process was a report commissioned by the Norwegian Ministry of Finance, that produced an evaluation of

the fund's historical active management returns by three academics (Andrew Ang from Columbia, William Goetzmann from Yale, and Stephen Schaefer from London Business School).

The Ang, Goetzmann, and Schaefer (AGS) report ("Evaluation of Active Management of the Norwegian Government Pension Fund – Global") is an outstanding summary of the current state of the active versus passive debate. Right up front, the authors take a position we wholeheartedly support: "The most recent expressions of the Efficient Market Hypothesis (EMH) in academic research recognize the existence of market frictions, information costs, agency, and capital structure constraints. In this setting, there is no compelling theoretical or empirical evidence to recommend a pure strategy of passive indexing, although finding active managers who consistently deliver excess risk-adjusted returns to investors is rare." The first section of the AGS report provides "an extensive overview of the theoretical and empirical literature on the EMH." The authors note that "the balance between indexation and active management is a choice variable for which the optimum mix depends on general beliefs about the existence and potential of manager skill, the pricing opportunities afforded within a given market, the time preferences and risk aversion of the investor, and the expertise and incentive contract of the specific [active] manager." However, the authors' evaluation of the empirical track record of active managers (via an excellent summary of numerous studies) is not encouraging for supporters of this approach. Regarding studies of active retail mutual fund performance, AGS note that "recent theory and empirical evidence suggests that some fund managers may have talent and out-perform market benchmarks before fees. However, the evidence does not support the conclusion that superior ability filters through to the ultimate investors in those funds. In the mutual fund industry, after-fee returns and alphas are, on average, zero or negative." The authors acknowledge that the evidence for positive risk and fee adjusted returns in hedge funds is stronger than in mutual funds, though with the caveat that this conclusion is based on a much shorter data series. Similarly, they note that "in the real estate sector, there is simply not enough information to evaluate whether manager have added value on a risk adjusted basis." They also

note that “there is little convincing evidence of superior risk adjusted returns to private equity and venture capital.” Finally, AGS observe that “in other institutional investment sectors, such as large-scale endowments, pension funds and sovereign funds, there is even less evidence [than in mutual funds] about the capability of active management to generate positive risk adjusted returns.”

The AGS report then goes on to evaluate NBIM’s active management track record between January 1998 and September 2009. They note that NBIM’s approach to active management takes two forms. “Fundamental analysis looks at investment opportunities from the ‘bottom-up’ by finding attractive companies and securities and then aggregates to the portfolio level, while factor exposure is a ‘top-down’ investment technique that first chooses different factors and then implements exposure to them by trading securities. The authors find that “over the whole sample the active return on the total portfolio has a mean of 0.02% per month...we cannot find any statistical evidence of significant active outperformance [versus the weighted fund benchmark] over the sample taken as a whole.” The authors also note that “the absolute value of the active return added to the fund is relatively small.” However, this masks a difference between the fixed income and equity activities of the fund. In the former, the mean for the full sample is zero; in the latter, it is 0.05%. AGS note that “active management has, in a small way and on average, added value since the inception of the Fund.” The authors then analyze the extent to which the variance of the fund’s returns has been due to active management, compared to the Fund’s strategic asset allocation. Over the full sample, they find that 99.1% of the variance of returns was due to strategic asset allocation, and 0.9% due to active management. In the fixed income area, the corresponding numbers are 97.1% and 2.9%; in equities, 99.7% and 0.3%. The authors conclude, “these results are striking and among the most important in this report: for the full sample, the active management activities of the Fund accounted for less than one percent of the overall variance of returns...The implication of this is that [compared to strategic asset allocation], active management had an almost trivially small impact on the overall risk of the Fund.” In effect, the authors conclude that NBIM has been running an index fund.

Moreover, the authors also find that “a significant part [70%] of the very small component of the total Fund return represented by active return is linked to exposures to a number of well-recognized systematic factors. Thus the contribution of active management to the overall return that is genuinely idiosyncratic is extremely small indeed.” The systematic factors identified by the authors as being critical return drivers include, in the fixed income area, the term spread, credit spreads, and liquidity, and, in the equity area, value less growth, small less large, momentum and volatility. Regarding the Fund’s significant losses in 2008, AGS note that exposures to the liquidity (or, more accurately, illiquidity) factor and the volatility factor had the largest impact. Yet as a long-term investor with, at this point, no liabilities (given Norway’s continued production of oil and gas, which provide revenues for the Fund), the authors view these exposures as logically grounded in preferences that differ from those of the average investor. By taking higher than average exposure to illiquid assets and volatility, the Fund could, over the long-term, be expected to generate significant positive returns, though with the chance of “infrequent but large negative returns” – in short, an active returns profile similar to that of an insurance company. As the authors note, “put another way, if the factor exposures pre-2008 and during the financial crisis had been communicated and the asset owner [the Finance Ministry, and indirectly, Parliament as the representative of the Norwegian people] had some knowledge of the potential drawdowns of these factors, the Fund’s losses in 2008 would not have been surprising and would have been within expected loss limits.”

The key recommendations of the report focus on better integrating factor exposures into the management of the Fund. “We recommend a more top-down, intentional approach to strategic and dynamic factor exposures. This approach relies on expected equilibrium compensation for taking non-diversifiable risk. It is similar to collecting an insurance premium for bearing risk associated with those factors. The foundation of our proposal is the identification and construction of multiple factors that bear risk premiums and the transfer of these factors into the fund benchmark, rather than treating [factor exposures] as byproducts of other active management strategies. This approach is designed to utilize the Fund’s comparative advantages. First, it relies

upon the Fund's long-term outlook and lack of current liabilities. Factor premiums, like the equity risk premium of stocks, may exhibit consistent profitability only over long time horizons. However, earning them does not rely on indentifying mispriced securities...[Using this approach] we define active management in terms of two decisions. First, the decision to deviate from long-term strategic loadings on factors, and second, the decision to hold securities that differ in weights from the factor benchmark weights. These roughly correspond to timing and selection...We also recommend that different strategies be classified according to the horizon appropriate to the length of time it typically takes for profits from the strategies to be realized."

As you would expect, the AGS report provoked a response from NBIM that also makes for fascinating reading (see "Norges Bank's Active Management of the Government Pension Fund Global" and its 96 page enclosure). The letter contains a few points that may raise eyebrows. First, it notes that "in 2001, Norges Bank [the Central Bank] set a target of annual value added through active management of 0.25 percent. This target was quite ambitious given the relative risk associated with the Fund's management [presumably this refers to its long-term real return target of 4%, with a 40% allocation to fixed income, and 60% to equities]. After 12 years of active management, our assessment is that the experience has largely been positive. The annualized excess return relative to the benchmark portfolio currently stands at 0.22%, which is close to the target. This performance confirms that active management can make an important contribution to the overall return of the fund over time." Well, let's see – 25 basis points divided by 400 basis points equals – 6.25%. Okay, let's try that in future value terms. Assume we invest 1,000,000 Kroner for 30 years at 4.00% and at 4.25%. The difference in ending values from that extra 25 basis points per year increases future value by 7.47%, (242,238 divided by 3,243,398). On the other hand, when you are investing 400 billion, that additional 7.47% represents a non-trivial amount of money. And finding enough active opportunities to achieve that goal when you have to put so much money to work is certainly no easy task. So, on balance, we agree that, despite the apparently small size of the active return relative to the target, it can still be considered an impressive achievement. However, from the clients'

perspective (and in this case, said clients are represented by a national parliament), the risk taken on to achieve that extra return, as exemplified by the 2008 losses, may well be deemed excessive. As every advisor knows, the psychological and emotional dimensions of risk and uncertainty often trump the purely quantitative.

The second controversial point made in the letter is the assertion that “it is Norges Bank’s assessment that its mandate must include a stated objective of the highest possible returns to ensure the best possible quality in the performance of all aspects of its management task...An organization that aims to be average will achieve mediocrity.” Let’s just say that Jack Bogle and others might disagree with this. Matching a benchmark over thirty years would likely result in a cumulative performance that was better than 95% of all active managers (and I’m probably being conservative here).

NBIM’s response to the AGS report also made some very good points, particularly about the theoretical and empirical basis for a belief that active management can add value. They agree with AGS, and conclude that “modern financial theory acknowledges that the degree of efficiency can vary both over time and between market segments. How efficient a market is will depend partly on the numbers of informed and uninformed investors, and partly on the costs and risks associated with identifying and eliminating mispricings.” More importantly, they explicitly note yet another investment paradox: “Any empirical test of the efficient market hypothesis should examine whether a given excess return is solely compensation for additional risk. Only in cases where an investment strategy generates a positive risk-adjusted return after costs will the efficient market hypothesis be contradicted. The analysis should be performed using a model that specifies the relationship between return and risk. Any test of the efficient market hypothesis is therefore a combined test of both market efficiency and the asset pricing model specifying the relationship between return and risk. If a given investment strategy appears to generate a risk-adjusted excess return, this may be because the market is indeed inefficient, or it may be because the pricing model has been incorrectly specified. As it is impossible to rule out the possibility of the pricing model not taking

sufficient account of all aspects of the risk associated with a particular strategy, the efficient market hypothesis can never be rejected.” NBIM then highlights a fundamental disagreement in the active management debate: “Researchers in academic finance interpret [apparent violations of the EMH] differently, and can generally be divided into two camps. [One] assumes that participants in financial markets behave rationally, and that pricing in the market is generally efficient. They therefore argue that anomalies represent compensation for risk associated with the investment strategy which is not captured by the asset pricing model used...In the other camp, behavioral theorists argue that investors have a tendency, in a number of areas, to depart from the assumed rational behavior underlying the efficient markets hypothesis, and that opportunities to eliminate the resulting mispricings [e.g., the positive premiums on the value, small cap, and momentum factors, or the profits earned on carry trades in FX markets] are often limited in practice...enabling pricing inefficiencies to persist for a period of time.”

We found it interesting that neither AGS nor the NBIM reply explicitly mentioned Andrew Lo’s “Adaptive Markets Hypothesis” (AMH), which is grounded in complex adaptive systems theory, and which, in our view, provides the best explanation of why active managers find it so difficult to outperform index funds that track markets in which pricing is clearly less than perfectly efficient. In essence, this view holds that the economy itself is a complex adaptive system, in which cause and effect relationships are complex (e.g., effects can have multiple causes), non-linear, and often widely separated in time. This alone makes forecasting asset prices extremely difficult. In addition, this challenge is further complicated by the complex adaptive behavior of financial market investors, who are not only subject to a variety of cognitive biases and other shortcomings, but who also constantly evolve their investment strategies in response to recent events and their forecasts of future asset values and the likely actions of other investors. The AMH acknowledges that the relative efficiency of different financial markets is constantly in flux, while also showing why it is so hard for an active manager to consistently generate positive risk adjusted returns after all costs and taxes are taken into account.

On this last point, and in defense of active management, NBIM cites a number of studies that we have written about in the past, and which have become classics in the field, including Russ Wermers' "Mutual Fund Performance: An Empirical Decomposition into Stock-Picking Talent, Style, Transactions Costs, and Expenses", Berk and Green's "Mutual Fund Flows and Performance in Rational Markets", and Fama and French's "Luck Versus Skill in the Cross Section of Mutual Fund Returns". However, the key point that emerges from these studies is that, while some active managers clearly have superior skills, the value created by their forecasts is usually more than offset by the various costs they incur, including research and management; commission, bid/ask spread, and trading price impact; and taxes. NBIM's analysis concludes that "our review of empirical studies into the profitability of active management within various asset classes suggests that under certain conditions it is possible for investors to build up an informational advantage that can be applied in generating excess returns. However, the level of transaction costs and management fees will be critical as regards the proposition of excess return that accrues to the client.

NBIM also had plenty to say about the AGS proposal to move toward factor-based asset allocation. "Within asset classes, the investment opportunities will vary over time and optimal allocation with respect to systemic risk factors will also vary. In addition, new sources of systemic risk are constantly being identified, and systematic risk factors exist that cannot readily be represented by simple indexes...Assuming we accept the argument that a risk premium exists for the size and value factors, it will not necessarily be the case that the actual exposure of the portfolio to these factors should remain fixed over time. [For example], the risk premium for the size factor has declined in the U.S. market over time since it was described in the academic literature, [which] may be an outcome of the exploitation of this risk premium by investors...The momentum effect changes continuously. The satisfactory representation of this factor in a traditional benchmark portfolio will therefore not be possible...The size of the credit and foreign exchange risk premiums will vary over time, as will the ways these can best be exploited...These premiums are also anomalies that in various ways are

associated with both liquidity risk and the risk of extreme events...There is no unambiguous and generally accepted way of identifying and isolating systematic liquidity risk...The significance of liquidity in the pricing of financial assets is a large and active area of research within the field of academic finance. Our understanding of this risk factor and the development of new methods and instruments for use in gaining exposure to liquidity risk will change in the coming years...The volatility premium is also time varying.” In sum, while NBIM agrees that “a long-term investor with a high risk-bearing capacity should seek to exploit systematic risk factors”, it also believes that “the areas [asset classes and sub-classes] in which an investor receives the best payment for exposure to different risk factors will also change over time.” Given this, NBIM argues against including systematic risk factor exposures in benchmarks and strategic asset allocations, as proposed by AGS, and instead proposes to take them into account in the management of the Fund’s active management mandates.

Last but not least, the NBIM report also had some very sensible things to say about the importance of rebalancing. “A widespread approach among institutional investors is to apply fixed weights to various asset classes. If the markets are efficient, market capitalization will at any given time reflect the available investment opportunities. An investor adopting this approach should rebalance to a lower proportion of equities than the original point of departure if a major rise in share prices occurs. If the investment opportunities vary over time, and a downturn in the stock market results in expectations of higher risk premiums on equities, the optimal approach will be to rebalance to a higher proportion of equities than the original level. The use of fixed weights and a rebalancing regime means that the investor’s fund management will be based on time-varying risk premiums and that a certain degree of active management of systematic risk is institutionalized. A rebalancing regime of this nature will ensure that an investor has a rule in place that will increase exposure to an attractively priced risk premium in situations characterized by unrest and decision-making difficulty.”

Our key takeaways from this debate are as follows. First, most people now agree that financial markets are, to varying degrees, inefficient in the way they price assets, which theoretically creates the possibility of generating positive active management returns (alpha). Second, the evidence clearly shows that the incremental costs involved in pursuing active returns often negate the expected benefit. Third, it has been shown that active management returns are themselves a bit of a slippery concept. In some cases, they simply reflect a willingness to “take the other side” of imbalanced preferences (e.g., providing insurance to other investors who seek to hedge their liquidity and volatility risk exposures); in other cases, they reflect skill at timing tilts towards risk factors that are believed to earn premiums; and in other cases, active management returns reflect skill in forecasting fundamental security values. Fourth, given the importance of active management expenses, it comes as no surprise that we have and will continue to see rising interest in ways to reduce the cost of taking different active management tilts within different asset classes.

Finally, the most interesting innovation in this discussion is the development of investable long/short products that may do a better job of capturing these risk premiums than the long-only products that have preceded them. However, investors should never forget that any tilt away from a broad market capitalization based index represents an active management decision. As such, investors taking these tilts (and advisors recommending them) should be able to clearly state the logic that underlies their decision. As we have repeatedly noted over the years, three questions about factor tilts are paramount in our minds. First, does the additional return I hope to earn by taking this tilt reflect compensation for bearing additional risk, or the exploitation of mistakes made by other investors? Second, if I believe the additional return is compensation for taking additional risk, how well do I understand that risk (especially the size of the potential drawdowns it may produce), and why do I believe I am better positioned to absorb this risk than the average investor (e.g., unfortunately, we knew too many people who became Lloyds names and were wiped out in the 1990s because they didn’t understand the risk they were taking on)? Third, if I believe the additional return essentially comes from my outwitting some other investors, what are

the mistakes they are making, why should I expect that they will keep making them, and why, furthermore, should I expect that other smart investors won't also see what I see and arbitrage away the return premium I expect to receive from taking the tilt?

Last but not least, we are a long way from endorsing risk factor based asset allocation as an alternative to the traditional asset-class based approach. Why? First because given the continued debate over the definition and existence of different risk factors, and the underlying sources of the observed (and time varying) risk premiums for bearing them, we do not see a solid theoretical basis for estimating the equilibrium return an investor should expect to earn for exposure to different risk factors, or how these returns should vary under disequilibrium conditions (e.g., our high uncertainty and high inflation regimes). Second, as we have demonstrated in our Principal Components Analysis of asset class returns between 1990 and 2006 and then in 2007-2008, the loading of different asset classes on different statistical risk factors varies over time. This should also be the case for risk factors based on different methodologies, whether it be macroeconomic variables, psycho-social variables (e.g., investor sentiment), or financial market variables (e.g., the value, small cap, credit, and momentum risk factors). As a practical matter, this seems to make the implementation of a risk factor based approach to asset allocation very difficult in an environment where both risk factor premiums and risk factor loadings on different asset classes are constantly changing over time. So while we continue to closely follow this extremely interesting debate, we won't be changing our approach to asset allocation any time soon.

Product and Strategy Notes

- Many times an advisor will be presented with a new active strategy idea that is accompanied by impressive backtesting results. A recent paper should cause you to examine these analyses with an even more skepticism than is likely

already the case. In “Look Ahead Benchmark Bias in Portfolio Performance Evaluation”, Daniel, Sornette, and Wohrmann observe that “most professional databases do not track changes in the constitution of benchmark portfolios.” Because of this, most backtesting is based on the performance of the securities or companies that comprised the benchmark at the end of the performance evaluation period rather than the beginning. The authors conclude that this can result in overestimation of strategy performance of up to 8% per year, as well as a gross underestimation of strategy risk.

- One of the most frequently heard complaints over the past decade has been that an increasing focus on the short term is (depending on who is making the argument) (a) increasing trading volumes, and reducing the returns earned by fund investors; (b) causing corporate management to make shareholder value destroying decisions; (c) enriching investment banks; and/or (d) all of the above. A new report from the IRRC Institute and Mercer Consulting only adds to these concerns. “Investment Horizons: Do Managers Do What They Say?” examines the investment horizons “of active long-only equity managers across different geographies and styles between June 2006 and June 2009.” The authors note that “the overall aim of this research was not to prove that long-horizon investing is good or short-horizon investing is bad (or vice versa), as we recognize that there is a valid role and function for all types of horizons and approaches to investment. Rather, the aim was to examine the extent to which there is a mismatch between the time horizon over which investors think and say they invest and how they actually invest.” The research found that “nearly two thirds of strategies have higher turnover than expected... On average, turnover was 26% higher than anticipated, with some strategies recording more than 150% to 200% higher turnover than anticipated.” Within the entire sample, the average annual turnover was 72%. Based on this, the authors conclude “short-termism exists and constitutes a material tail risk of investment strategies.” Digging further into the causes of short-termism, the authors found

that “key themes included volatile markets and changing macroeconomic conditions; the emergence of more short term traders, such as hedge funds; mixed signals from clients; short-term incentive systems; and behavioral biases, such as herding, overconfidence, and recency.”

- Over the past fourteen years, we have repeatedly noted that the extreme difficulty of consistently successful active management, along with its higher costs, makes a passive approach a far better alternative for most investors to pursue for most of their portfolio assets (we still recognize the undeniable mathematical attractiveness of uncorrelated alpha strategies, particularly for investors who need to earn relatively high compound real rates of return to achieve their long term goals). A recent paper by Bhattacharya and Galpin shows that in practice this view is becoming more widely adopted, even if it is sometime not openly acknowledged. In “The Global Rise of the Value-Weighted Portfolio”, the authors devise a new metric to test for investor use of value (market capitalization) weighting. “If every person maintains a value weighted portfolio, the weight of a stock in that portfolio should completely explain its trading volume.” By comparing relative stock trading volumes and capitalization weights, the authors infer the extent to which value weighting is used by investors. They apply this approach to markets in 46 countries, and find that between 1995 and 2007, value weighting has become more popular in 35 countries. On an individual country basis, they conclude that value weighting is most popular in Ireland, the UK, USA, Australia, Italy, Sweden, Hong Kong, and the Netherlands, and least popular in Switzerland, Pakistan, Brazil and India.
- While market capitalization weighting is becoming more important, a substantial amount of money is still actively managed around the world. Given the track record of active managers, many observers have wondered over the years about the underlying causes of active management’s continuing attractions to

investors. In “On the Size of the Active Management Industry”, Pastor and Stambaugh make a new attempt at answering this question. They focus on “the role of historical data, and how investors use it in practice.” The authors start with the observation that “there are decreasing returns to scale in the active management industry – any manager’s ability to outperform a benchmark declines as the industry’s size increases...As more money chases opportunities to outperform, prices are impacted and such opportunities become more elusive...Under decreasing returns to scale, investors learn about the degree of these decreasing returns over time and thereby determine the active management industry’s equilibrium size.” However, “investors face endogeneity that limits their learning...As they update their beliefs about decreasing returns to scale, they adjust the fraction of their investable wealth allocated to active management, and learn by observing the industry’s returns after that follow different allocations...[However], what they learn affects how much they allocate, and how much they allocate affects how much they learn.” In essence, this feedback loop makes accurate learning more difficult, and results in an active management industry that is larger than it might be in equilibrium. As far as it goes, this is an interesting paper; however, we believe that it also neglects some other very important explanations for the amount of money that is actively managed, in spite of a substantial amount of accumulated evidence about the odds of outperforming passive investment over the long term. These include the fact that over the past 30 years, an increasing amount of money has been managed by delegated managers (which creates significant agency/incentive problems), the dependence of many media outlets on financial advertising, and, perhaps most important of all, the powerful impact of human emotions, and in particular the envy that is inspired by another’s investing success, regardless of whether that success reflects luck, skill, or simply a different set of preferences.

- Three Interesting New Papers on Residential Property. In “Housing Risk and Return: Evidence from a Housing Asset-Pricing Model”, Case, Cotter and Gabriel test an asset pricing model for residential property wherein “the expected returns of metropolitan area specific housing markets are equated to the market return, as represented by an aggregate U.S. house price time series.” The authors also test the impact of augmenting this basic single factor model with a number of other risk factors, including stock market returns and momentum. They find that the single factor model works quite well, and points to a clear relationship between risk and return in different U.S. housing markets. Specifically, high beta (high risk) markets tend to be found on the east and west coasts. They also find that betas are time varying and that the housing risk/return tradeoff shows evidence of non-linearity. This non-linearity is also found in another recent paper, “Chartists and Fundamentalists in the U.S. Housing Market” by Kouwenberg and Zwinkels. Similar to other agent based market models, the authors allow a group of heterogeneous agents to switch between using a trend following (chartist) or fundamental valuation model when forecasting housing prices, and the seek to fit their model (and the underlying agent behavior rules) to historical U.S. data between 1992 and 2005. They find that historically the proportion of agents using each forecasting strategy has been roughly equal. However, the chartist share began to significantly increase towards the end of the sample period, and as a result housing prices climbed well above fundamental values based on capitalized rents. As we all now know, the results of this shift have been disastrous. A third paper, “Housing Options: For Sale By Owner” by Louis Odette of Moody’s Wall Street Analytics, proposes a new approach to solving the problems we face today in the housing market. In essence, the owner of a home whose value is significantly below the value of the mortgage on it, could sell a covered call option on its value, assuming the house is sold. This could be done as part of a reduction in the principal of the existing mortgage. This is a very similar approach to one we have proposed before (based on our experience in post-Latin American debt crisis

restructurings) that would convert a portion of existing mortgages into equity, which the lender could then pool and use to back the issuance of new investable index products that track the value of residential property as a broad asset class. Frankly, Odette's approach strikes us as operationally easier to implement than our approach, but very similar in terms of its ultimate economic impact. We hope his paper gets wide reading in Washington, D.C., because we don't think the initiatives that have been undertaken thus far are up to solving the very large housing and mortgage market problems that still confront the United States and other countries.

- We couldn't help but notice an interesting article in the 7Feb10 *Financial Times*. In "More Managers Turning to Commodities to Diversify", Ruth Sullivan writes that "recent research by Bank of America Merrill Lynch into nearly 300 commodity investment vehicles with \$123 billion of assets under management shows low interest in actively managed funds. Only 18 percent of commodity investors put their money into actively managed funds. The rest are passive, with the majority of those (60 percent) choosing exchange traded products. However, the research also indicates that 76 percent of actively managed broad based commodity hedge and mutual funds have outperformed their benchmarks since launch." We think this article highlights our choice last year to switch from a passive long-only index product (based on the Dow Jones UBS Commodities Index) to implement our allocation to this asset class, to LSC, an ETF based on the S&P Commodities Trend Index, which takes both long and short positions in different commodities, based on an underlying formula. In our view, LSC and similar "semi-active" long/short funds should have a long-term advantage compared to commodity funds that can only take long positions in futures contracts (which causes futures contract prices to become elevated – or contangoed – relative to spot prices, which in turn generates negative roll returns, as the assets in these long-only funds increase). However, funds like

LSC are still much less expensive than most actively managed products. In short, this approach continues to be attractive on both a macro and micro basis.

Model Portfolios Year-to-Date Nominal Returns

We offer over 2,000 model portfolio solutions for subscribers whose functional currencies (that is, the currency in which their target income and bequest/savings are denominated) include Australian, Canadian, and U.S. Dollars, Euro, Yen, Pounds-Sterling, Swiss Francs and Indian Rupees. In addition to currency, each solution is based on input values for three other variables:

- 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 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 0.44% (in nominal terms). The second benchmark we use is a portfolio equally allocated between the ten asset classes we use (it does not include 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>

Appendix: Economic Scenarios and Accumulated Evidence

The following table summarizes the accumulated evidence over the past three months (on a rolling basis) against both of our scenarios in the following table. More specifically, we report evidence that seems significantly more likely to be observed if a scenario is false than if it is true. This is in the spirit of the scientific method, where one tries not to *prove* hypotheses, but to *disprove* them. This approach also helps to

minimize the risk that our conclusions will be skewed by the confirmation bias, of the tendency to only look for, and give relatively heavier weight to evidence which confirms one's existing views. We do not claim that this approach is foolproof, nor that it guarantees perfect objectivity and foresight. However, evidence from the use of this approach in the intelligence community suggests that it does help to improve forecast accuracy.

	Cooperative Scenario	Conflict Scenario
<i>Brief Scenario Description:</i>	More rapid domestic consumption growth in China and cleantech investment demand in North America return the world to a health 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, while 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.
<i>Key Agent Level Scenario Assumptions</i>		
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	Continued economic stagnation, uncertainty, and insecurity lead to more extreme partisanship and the development of strong populist calls for protectionism and income redistribution.

	Cooperative Scenario	Conflict Scenario
	and lower consumption, without triggering populist demands for protectionism.	
Chinese Peasants	Land reform and economic growth (which provides jobs) boost 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.	Growing unemployment and a sense that government stimulus is 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 defeat of President Ahmadinejad in June 2009 elections, 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 is re-elected. 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.

	Cooperative Scenario	Conflict Scenario
<i>Key Issue Level Scenario Assumptions:</i>		
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.
<i>Evidence Over the Previous Three Months Against Each Scenario (most recent month first)</i>	<i>Evidence Against the Cooperative Scenario</i>	<i>Evidence Against the Conflict Scenario</i>
January 2009 (this issue)	• Evidence of continuing	•

	Cooperative Scenario	Conflict Scenario
	<p>deterioration in commercial and residential property portfolios that will put further pressure on the financial system.</p> <ul style="list-style-type: none"> • Rising concerns about sovereign and U.S. municipal debt quality. • Continued high unemployment and uncertainty that, along with lack of credit, holds down consumption spending and also business investment • Rising conflicts between the West and China, along multiple dimensions. • Growing evidence of a worsening property bubble in China. • Evidence of weakening popular confidence in government’s ability to address the challenges we face, particularly in the US and UK • Iran resumes uranium enrichment, and IAEA announced evidence that Iran may be developing a nuclear warhead. • Continued Chinese and Russian resistance to sanctions in Iran. 	
December 2009	<ul style="list-style-type: none"> • Times of London published more damning evidence about Iran’s 	<ul style="list-style-type: none"> • <i>Economist</i> publishes an extensive article arguing that negative stories

	Cooperative Scenario	Conflict Scenario
	<p>nuclear program; large opposition demonstrations on Ashura holiday are met with government crackdown on opposition leadership. Obama Administration appears to be moving away from desire to negotiate with Iran.</p> <ul style="list-style-type: none"> • Rising number of papers, articles, OpEds that are harshly critical of China’s refusal to let Renminbi appreciate. Jim Chanos receives much coverage for his negative beliefs about China. • Google (and Hilary Clinton’s) growing conflict with China are just the latest in a growing list of conflicts (e.g., with RioTinto). • China is blamed for failure of Copenhagen Conference to achieve progress on CO2 emissions reduction. • Increasing number of findings – in both the U.S. and China – that the other side is restricting or illegally subsidizing trade in different product categories. • Sharp increase in worries about the creditworthiness of Greece, widening 	<p>about China are overblown, and that its economic growth should continue and help maintain global aggregate demand (which, in turn, will reduce pressure on U.S. to continue aggressive fiscal policy and deficits – of course, this assumes no worsening of trade relations between China and the U.S., which would block an increase in U.S. exports)</p> <ul style="list-style-type: none"> • Scott Brown’s election to U.S. Senate may force Obama administration back into the center, as a similar shock forced the Clinton administration to moderate its position. In the latter case, this resulted in faster progress on key policy issues (e.g., welfare and budget reform).

	Cooperative Scenario	Conflict Scenario
	<p>spreads on its sovereign bonds vs. German Bunds, and spread of credit concerns to Spain, Ireland and Portugal.</p> <ul style="list-style-type: none"> • Iceland refuses to pass legislation committing public funds to repay UK government for making good on Iceland deposit insurance fund's guarantee of foreign "IceSave" deposits. • Widening coverage and greater understanding of depth of fiscal problems faced by state and local governments in U.S. This is compounded by apparent inability of multiple governments to take the painful steps needed to address these problems. • Growing discussion of "strategic defaults" in U.S. by homeowners with underwater mortgages. If commercial borrowers can do it, why not us too? • Scott Brown election in Massachusetts may tank U.S. healthcare reform and usher in a prolonged period of legislative gridlock.. 	
November 2009	<ul style="list-style-type: none"> • Israeli press leaks indicate that patience with Iran's stalling 	<ul style="list-style-type: none"> • US EPA announces finding that greenhouse gases endanger human

	Cooperative Scenario	Conflict Scenario
	<p>tactics in the nuclear talks is at or close to the point of exhaustion, raising the probability of military action.</p> <ul style="list-style-type: none"> • Publication of more articles forecasting increased trade conflicts with China in 2010, given continued undervaluation of Renminbi and emphasis on investment to increase capacity in export industries. • China takes aggressive stance vis-a-vis the west at opening of Copenhagen climate talks. • US mortgage modification program is apparently having little success; Dubai default, downgrading of Greece, and worsening commercial real estate conditions show that credit crisis continues • Despite this, banks still seem intent on paying extremely high, and politically incendiary bonuses at year end 	<p>health, setting the stage for more aggressive regulations that could also stimulate higher business investment.</p> <ul style="list-style-type: none"> • Obama administration begins campaign for second stimulus program aimed at reducing high levels of unemployment in USA that are constraining consumption spending