

The Index Investor

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December 2009 Issue: Key Points

This month's feature article is our year end review. We look at the most important lessons we've learned over the past two difficult years, our outlook for what lies ahead, and what we can do to prepare ourselves to adapt quickly when we are inevitably surprised by unexpected changes. The main point for readers to take away is that we anticipate a rough ride in 2010, with a return to the High Uncertainty regime. We conclude that many equity markets are probably substantially overvalued today, due to strong momentum effects that likely reflect the increasingly important role of short term algorithmic trading as much as human errors caused by strong emotion, social effects,

and cognitive shortcomings. Given the strong financial incentives that many professional asset managers have to maintain gains (and their bonuses) through the end of this year, we believe that this provides a window for portfolio rebalancing away from equity exposures, and into either liquid reserves (given the uncertainty, think 12 – 24 months of expenses) or increased allocations to undervalued asset classes.

We also emphasize that next year will be a particularly challenging one for financial advisers, with many markets set for dramatic regulatory changes (e.g., the end of commissions and the shift to fiduciary responsibility for all), existing clients increasing their demand for more frequent value added communication and reassurance, and new clients seeking out professional advice as their circumstances become more challenging. In short, we believe 2010 will be a time of crisis in the Chinese sense: a combination of danger plus opportunity.

This month's product and strategy notes cover a lot of ground, from gift book ideas to more on municipal bond market problems, the separation of alpha from beta investing, a quantitative analysis of the return, risk and correlation of direct oil and gas investments, and another analysis of how the inclusion of timberland benefits a portfolio. We also summarize many interesting research papers that didn't make it into other issues of our journals this year.

Global Asset Class Returns

YTD 30Nov09	In USD	In AUD	In CAD	In EUR	In JPY	In GBP	In CHF	In INR
Asset Held								
USD Bonds	0.79%	-30.50%	-16.31%	-7.22%	-4.44%	-13.35%	-5.20%	-3.95%
USD Prop.	21.06%	-10.22%	3.96%	13.05%	15.83%	6.92%	15.08%	16.32%
USD Equity	25.12%	-6.16%	8.02%	17.11%	19.89%	10.98%	19.14%	20.38%
AUD Bonds	20.54%	-10.75%	3.44%	12.53%	15.31%	6.40%	14.55%	15.80%
AUD Prop.	33.56%	2.28%	16.46%	25.55%	28.33%	19.42%	27.58%	28.82%
AUD Equity	61.68%	30.39%	44.58%	53.67%	56.45%	47.54%	55.69%	56.94%
CAD Bonds	19.62%	-11.66%	2.53%	11.62%	14.39%	5.48%	13.64%	14.88%
CAD Prop.	55.65%	24.37%	38.55%	47.64%	50.42%	41.51%	49.67%	50.91%
CAD Equity	48.36%	17.08%	31.26%	40.36%	43.13%	34.22%	42.38%	43.62%
CHF Bonds	18.63%	-12.66%	1.53%	10.62%	13.40%	4.49%	12.65%	13.89%

YTD 30Nov09	In USD	In AUD	In CAD	In EUR	In JPY	In GBP	In CHF	In INR
CHF Prop.	23.40%	-7.88%	6.30%	15.39%	18.17%	9.26%	17.42%	18.66%
CHF Equity	20.56%	-10.73%	3.46%	12.55%	15.32%	6.42%	14.57%	15.81%
INR Bonds	-8.33%	-39.61%	-25.43%	-16.34%	-13.56%	-22.47%	-14.31%	-13.07%
INR Equity	80.19%	48.91%	63.09%	72.18%	74.96%	66.05%	74.21%	75.45%
EUR Bonds	6.08%	-25.20%	-11.01%	-1.92%	0.85%	-8.06%	0.10%	1.34%
EUR Prop.	41.44%	10.16%	24.34%	33.43%	36.21%	27.30%	35.46%	36.70%
EUR Equity	26.71%	-4.57%	9.61%	18.71%	21.48%	12.57%	20.73%	21.97%
JPY Bonds	4.44%	-26.84%	-12.66%	-3.56%	-0.79%	-9.70%	-1.54%	-0.30%
JPY Prop.	3.63%	-27.66%	-13.47%	-4.38%	-1.60%	-10.51%	-2.36%	-1.11%
JPY Equity	0.31%	-30.97%	-16.79%	-7.69%	-4.92%	-13.83%	-5.67%	-4.43%
GBP Bonds	15.20%	-16.08%	-1.89%	7.20%	9.97%	1.06%	9.22%	10.46%
GBP Prop.	22.12%	-9.17%	5.02%	14.11%	16.89%	7.98%	16.13%	17.38%
GBP Equity	33.40%	2.12%	16.30%	25.39%	28.17%	19.26%	27.42%	28.66%
1-3 Yr USGvt	1.19%	-30.09%	-15.91%	-6.82%	-4.04%	-12.95%	-4.79%	-3.55%
World Bonds	8.54%	-22.75%	-8.56%	0.53%	3.31%	-5.60%	2.56%	3.80%
World Prop.	25.88%	-5.40%	8.78%	17.87%	20.65%	11.74%	19.90%	21.14%
World Equity	30.62%	-0.66%	13.53%	22.62%	25.39%	16.48%	24.64%	25.88%
Commod Long Futures	17.45%	-13.83%	0.35%	9.44%	12.22%	3.31%	11.47%	12.71%
Commod L/Shrt	-12.16%	-43.44%	-29.26%	-20.16%	-17.39%	-26.30%	-18.14%	-16.90%
Gold	33.66%	2.37%	16.56%	25.65%	28.43%	19.52%	27.68%	28.92%
Timber	5.69%	-25.59%	-11.41%	-2.32%	0.46%	-8.45%	-0.29%	0.95%
Uncorrel Alpha	9.85%	-21.44%	-7.25%	1.84%	4.62%	-4.29%	3.86%	5.11%
Volatility VIX	-39.08%	-70.36%	-56.17%	-47.08%	-44.31%	-53.21%	-45.06%	-43.82%
Currency								
AUD	31.28%	0.00%	14.18%	23.28%	26.05%	17.14%	25.30%	26.54%
CAD	17.10%	-14.18%	0.00%	9.09%	11.87%	2.96%	11.12%	12.36%
EUR	8.01%	-23.28%	-9.09%	0.00%	2.78%	-6.13%	2.02%	3.27%
JPY	5.23%	-26.05%	-11.87%	-2.78%	0.00%	-8.91%	-0.75%	0.49%
GBP	14.14%	-17.14%	-2.96%	6.13%	8.91%	0.00%	8.16%	9.40%
USD	0.00%	-31.28%	-17.10%	-8.01%	-5.23%	-14.14%	-5.98%	-4.74%
CHF	5.98%	-25.30%	-11.12%	-2.02%	0.75%	-8.16%	0.00%	1.24%
INR	4.74%	-26.54%	-12.36%	-3.27%	-0.49%	-9.40%	-1.24%	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 30Nov09	In USD	In AUD	In CAD	In EUR	In JPY	In GBP	In CHF	In INR
Eq Mkt Neutral								
HSKAX	-3.54%	-34.82%	-20.64%	-11.55%	-8.77%	-17.68%	-9.52%	-8.28%
OGNAX	-1.19%	-32.47%	-18.29%	-9.20%	-6.42%	-15.33%	-7.17%	-5.93%
Arbitrage								
ARBFX	9.14%	-22.15%	-7.96%	1.13%	3.91%	-5.00%	3.16%	4.40%
ADANX	7.10%	-24.18%	-10.00%	-0.91%	1.87%	-7.04%	1.12%	2.36%
Currency								
DBV	17.71%	-13.57%	0.61%	9.71%	12.48%	3.57%	11.73%	12.97%
ICI	4.58%	-26.70%	-12.52%	-3.42%	-0.65%	-9.56%	-1.40%	-0.16%
Equity L/S								
HSGFX	4.42%	-26.87%	-12.68%	-3.59%	-0.82%	-9.72%	-1.57%	-0.33%
PTFAX	16.70%	-14.58%	-0.40%	8.70%	11.47%	2.56%	10.72%	11.96%
GTAA								
MDLOX	21.21%	-10.07%	4.11%	13.20%	15.98%	7.07%	15.23%	16.47%
PASAX	22.33%	-8.95%	5.23%	14.32%	17.10%	8.19%	16.35%	17.59%

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.

Rolling Three Month Returns in USD			30-Nov-09
<i>High Uncertainty</i>	<i>High Inflation</i>	<i>Normal Growth</i>	
Short Maturity US Govt Bonds (SHY) 0.97%	US Real Return Bonds (TIP) 6.01%	US Equity (VTI) 7.15%	
1 - 3 Year International Treasury Bonds (ISHG) 4.64%	Long Commodities (DJP) 9.22%	EAFE Equity (EFA) 5.14%	
Equity Volatility (VIX) -6.31%	Global Commercial Property (RWO) 6.34%	Emerging Equity (EEM) 14.76%	
Gold (GLD) 23.81%	Long Maturity Nominal Treasury Bonds (TLT)* 0.99%	High Yield Bonds (HYG) 6.91%	
<i>Average</i> 5.78%	<i>Average (with TLT short)</i> 5.15%	<i>Average</i> 8.49%	
<i>Three Months Ago:</i> -2.66%	<i>Three Months Ago:</i> 4.81%	<i>Three Months Ago:</i> 10.03%	

* Falling returns on TLT indicate rising inflation expectations

As you can see, at the end of last month, the conventional wisdom continued to evolve away from a dominant belief that we are in or moving towards the normal regime. On balance, the belief that we are in or heading toward the high uncertainty regime has strengthened more than the belief we are in or heading towards the high inflation regime.

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. We are the first to admit that this 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 the end of **November 2009**, over a one year time horizon. Note that our views on valuation over a longer time horizon sometimes differ from our short-term views. As we repeatedly note, when discussing asset class valuation (or any forecast, for that matter), being specific about the time horizon is critical. Our longer term

valuation views are contained in the Global Asset Class Valuation Analysis section of each month's journal.

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 30 Nov 09	Current Price versus 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	6.74%	1.90%
AUD Bonds	Neutral	Positive, Accelerating	4.06%	-0.28%
AUD Property	Neutral	Positive, Slowing	14.41%	22.81%
AUD Equity	Neutral	Positive, Slowing	12.28%	18.61%
CAD Real Bonds	Neutral	Positive, Slowing	3.14%	5.08%
CAD Bonds	Neutral	Positive, Neutral	2.84%	2.10%
CAD Property	Likely Undervalued	Positive, Accelerating	14.11%	13.44%
CAD Equity	Likely Overvalued	Positive, Accelerating	7.19%	5.70%
CHF Bonds	Possibly Overvalued	Positive, Slowing	1.48%	4.09%
CHF Property	Possibly Overvalued	Positive, Accelerating	16.13%	8.08%
CHF Equity	Probably Overvalued	Positive, Slowing	6.02%	16.95%
EUR Real Bonds	Neutral	Positive, Neutral	3.25%	3.53%
EUR Bonds	Neutral	Positive, Slowing	1.27%	3.54%
EUR Prop.	Neutral	Positive, Slowing	18.59%	20.65%
EUR Equity	Neutral	Positive, Accelerating	14.07%	6.12%
GBP Real Bonds	Possibly Overvalued	Positive, Accelerating	7.30%	3.65%
GBP Bonds	Neutral	Positive Accelerating	4.36%	3.44%

Valuation at 30 Nov 09	Current Price versus 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
GBP Property	Neutral	Positive, Slowing	16.50%	30.75%
GBP Equity	Likely Undervalued	Positive, Neutral	13.69%	13.00%
INR Bonds	Possibly Overvalued	Negative, Slowing	-6.21%	-8.73%
INR Equity	Probably Overvalued	Positive, Accelerating	8.01%	7.12%
JPY Real Bonds	Neutral	Positive, Slowing	2.41%	7.08%
JPY Bonds	Possibly Overvalued	Positive, Neutral	1.59%	1.99%
JPY Property	Likely Undervalued	Negative, Accelerating	-7.22%	14.84%
JPY Equity	Probably Overvalued	Negative, Accelerating	-13.24%	6.47%
USD Real Bonds	Neutral	Positive, Accelerating	7.32%	1.49%
USD Bonds	Neutral	Negative, Accelerating	-2.67%	3.03%
USD Property	Neutral	Positive, Neutral	23.90%	22.01%
USD Equity	Probably Overvalued	Positive, Neutral	11.15%	12.17%
Following in USD:				
Investment Grade Credit (CIU)	Possibly Overvalued	Positive, Slowing	4.39%	5.44%
High Yield Credit (HYG)	Probably Overvalued	Positive, Slowing	4.81%	8.22%
Emerging Mkt Equity (EEM)	Probably Overvalued	Positive, Slowing	13.45%	29.74%
Commodities Long	Possibly Overvalued	Positive, Accelerating	8.00%	-0.21%
Gold	Possibly Undervalued	Positive, Accelerating	23.88%	-2.91%
Timber	Likely Undervalued	Positive, Accelerating	8.96%	-3.83%
Uncorrelated Alpha	N/A	Positive, Neutral	3.06%	3.38%
Volatility (VIX)	Probably Undervalued	Negative, Slowing	-5.98%	-10.06%
Future Return in Local Currency from holding USD:	Based on Covered Interest Parity			
Returns to AUD Investor	Positive	Negative, Accelerating	-14.92%	-7.17%
Returns to CAD Investor	Neutral	Negative, Accelerating	-3.38%	0.30%
Returns to EUR Investor	Neutral	Negative, Accelerating	-6.14%	-1.44%

Valuation at 30 Nov 09	Current Price versus 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
Returns to JPY Investor	Negative	Negative, Accelerating	-10.63%	-2.61%
Returns to GBP Investor	Neutral	Positive, Accelerating	1.38%	-1.36%
Returns to CHF Investor	Negative	Negative, Accelerating	-7.01%	0.90%
Returns to INR Investor	Positive	Negative, Accelerating	-3.18%	3.75%

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, 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 so far for 2009 (note that they differ from last month because we have dropped Commodities Long/Short from our data set, in the belief that Commodities Long-Only provides a more accurate view):

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov
(0.56)	(0.73)	(0.46)	0.03	0.24	0.14	0.35	0.68	0.57	0.62	0.62

As you can see, in 2009 global financial markets appear to have swung from a relatively ordered and negatively oriented state early in the year, through a period of disorganization during the spring and early summer, then into a period of stronger positive orientation by August that has only reversed slightly since then. In short, we believe conditions exist that are conducive to rapid changes in asset prices, most likely due to a triggering event that causes investors’ to question the fundamental

understanding of the processes driving asset prices (i.e., the structure of their mental models), and thereby raises their uncertainty and fear.

This Month's Letters to the Editor

Your article on luck versus skill in corporate performance did what all good information should do – stimulated me to ask more questions. Perhaps the biggest question is how do you get lucky? To put it bluntly, I think you keep trying and pray that you have enough resources available to keep going until you get lucky. What do you think?

We agree with you. Over the past thirty years, our faith forecasting has steadily declined, while our faith in learning from the past and buying options on the future has greatly increased. Holding a diversified portfolio of options acquired at reasonable cost – be they career options, corporate innovation options, or a diversified investment portfolio – enables you to respond quickly to the arrival of both surprising opportunities and surprising threats. This is also consistent with, for us, one of the most insightful findings from complex adaptive systems research: a system's adaptability and creativity are maximized when its internal connectedness matches its external connectedness. When a system (e.g., a social group, a company, a province or a nation-state or bloc of nations) has more external connections than internal connections, it is driven towards chaotic behavior (think "constant fire drills"). In contrast, when internal connections significantly exceed external connections (e.g., high insularity, or parochialism) the system tends to be excessively stability and at a higher risk of extinction when its environment changes (e.g., technological possibilities, customer needs, competitor offerings, economic conditions, etc.). To outsiders, a superior ability to adapt may look like luck, as there is no "master plan" involved beyond the foresight to see the future as a range of possible scenarios, to understand what it will take to survive, and hopefully prosper, in each of them, positioning oneself accordingly and never giving up. Perhaps that's what people mean when they say "you make your luck", or "fortune favors the prepared." Finally, we also agree with your point about ensuring you have adequate resources to exercise your options and adapt

to change. Unfortunately, maintaining those resources often requires CEOs to endure attacks from activist shareholders and analysts who think that not using up all your debt capacity to generate the highest possible short term shareholder returns is somehow irresponsible. From the perspective of a fund manager trying to get his or her bonus for this year's portfolio performance, this may appear to be true; however, the company's customers, suppliers, and employees, as well as the governments that depend on it to generate tax revenue, usually have a very different perspective. The law, however, often enshrines shareholder value maximization as the most important goal for a CEO and board to pursue, so the fight to preserve apparently "slack" resources that are critical to adaptation is often a very lonely and difficult one.

Why do you think the Deloitte study on corporate skill versus luck found that "many more firms are lucky than unlucky?" Wouldn't you expect the relationship to be symmetrical?

We would if the skills needed to avoid failure were as prevalent in the population of managers as the skills needed to deliver statistically significant success. But that doesn't seem to be the case. Avoiding failure – that is, landing your company in the middle of the performance distribution – essentially means getting the basics right. While in practice every manager knows that this is far from easy, there is little disagreement on the processes involved. Manager's who aren't above a minimum performance level when it comes to executing the basics usually don't last long, so the skills required to avoid failure are probably quite prevalent in the population of managers. In contrast, the skills required to consistently deliver superior performance are much more of a mystery, and probably much rarer among corporate managers, just as they are when it comes to superior active investment management.

Consider a simple numerical example. Assume performance results from an additive combination of luck plus skill. Assume the value of luck has a triangular distribution, with a minimum of negative (5), a midpoint (most likely) value of zero, and a maximum value of positive 5. Assume that skill has a triangular distribution, but with

a minimum of only negative (2), a midpoint (most likely) value of zero, and a maximum value of positive 5. The lowest possible performance value is thus negative (7), while the highest is positive 10. After 10,000 simulations, the median performance score is positive 1. Eighty six percent of the performance values lie between negative (4) and positive 4. Two percent of the scores are less than negative four, while twelve percent are greater than positive four. Of these latter scores, it is clear that those with a value above five involve some degree of luck as well as skill. Moreover, it is only easy to disentangle these effects when the scores are truly rare, say above 8 or 9, and you can be confident that superior skill is involved.

Finally, to refer back to the previous question, I don't think this superior skill involves forecasting accuracy as much as good foresight, an ability to identify good options and acquire them at low cost, skill in building and conserving resources, and also in deploying them quickly to exercise and scale up options that are "in the money." It is hard to describe how extraordinarily hard it is for a CEO and management team to follow that game plan, in a world of boards and investment analysts who tend to equate competence with the ability to make accurate forecasts and to deliver against detailed plans and targets that may have long ago been made obsolete by quickly changing circumstances. The military understands this; too much of the private and public sector still do not. Until that changes, I think the survival of people with the skills to deliver superior long term performance will remain very rare in executive suites.

What do you think about Vanguard's new bond ETFs?

In early December, Vanguard launched seven new ETFs in the United States. Because these are separate share classes of existing index mutual funds, their annual expenses are very low. Six of the funds fill a matrix of short, intermediate, and long maturities, and government and investment grade corporate bonds. They complement existing Vanguard bond ETFs that track short, intermediate and long term government/corporate credit indexes. In effect, the new ETFs break out government

and corporate credit as separate categories. The seventh new ETF tracks a U.S. agency (Fannie, Freddie, and Ginnie) mortgage-backed pass-through securities index. For our purposes, the most interesting of these new ETFs is VGSH, which, like SHY, tracks a 1 – 3 year US Government bond index. Given the superior performance of this bond market sector during the High Uncertainty regime, we are considering it for inclusion in our updated model portfolios.

December 2009 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.

As a hectic year winds down, recent weeks have been relatively quiet on the new developments front. In Iran, there has been renewed rioting on university campuses as protests against the Ahmadinejad regime turned violent. However, there is no sign that these protests are spreading beyond the student core, and the regime does not appear to be in imminent danger from within. That might not be the case on the external front, however, with Israel providing clear signals that its patience has run out with Iran's continued stalling in talks with the west over the future of its nuclear program. In China, while the government's recently concluded annual economic review struck all the right notes about its intended policy (e.g., increasing domestic consumption), the continuation of heavy investment in export industries and industrial capacity, as well as undervaluation of the Renminbi paint a far less reassuring picture of what lies ahead. More important, this view is gradually becoming the conventional wisdom, as evidenced by the recent publication of two excellent reports on rising Sino-American tensions: "The End of Chimerica" by Niall Ferguson and Moritz Schularick, and Michael Pettis' "Sharing the Pain: The Global Struggle Over Savings." We strongly recommend both of them. Finally, we note that at the just opened Copenhagen climate talks, China has taken an aggressive stance vis-a-vis the U.S. and the west, demanding much higher levels of technology transfer and financing to support climate change efforts in emerging markets. At a time when these governments' financing capacity is fully dedicated (and then some) to shoring up the

world financial system and maintaining aggregate demand, it is hard not to see this as further evidence that China's main intent is to press its national advantage rather than acting, as many had hoped, as a responsible supporter of the international system that has facilitated its rapid economic development over the past decade.

In the United States, the Environmental Protection Agency announced its finding that greenhouse gas emissions are dangerous to human health, setting the stage for more aggressive regulatory efforts in this area if the U.S. Congress fails to pass energy and environmental legislation. We continue to view this as a two edged sword – in the short term, more aggressive environmental regulations will raise energy costs for some and serve as a brake on economic growth. In the medium term, however, these regulations should stimulate higher levels of business investment. The Obama administration also began a campaign for a second round of stimulus spending, this time focused on job creation as high levels of unemployment, and the uncertainty created by fear of job loss continue to restrict consumer spending (and, indirectly, business investment). However, preliminary evidence also emerged that the administration's mortgage modification program was meeting with little success, while other stories noted worsening conditions in commercial property markets and, by implication, in the condition of many smaller and medium size banks with heavy exposure to construction and development loans. Credit market confidence also received additional negative shocks from Dubai's default and the downgrading of Greece's sovereign credit. Finally, there was no indication that major Wall Street banks had retreated from their plans to pay extremely large (and politically incendiary) bonuses this year, though the British government announced plans to heavily tax them. That said, criticism of the banking industry continued to mount, with Paul Volker questioning whether a decade of alleged "financial innovation" contributed anything to real economic, while GE's Jeffrey Immelt, in a speech at the U.S. Military Academy at West Point, announced his intention to shrink the size of GE Capital, stating that in recent years "rewards became perverted. The richest people made the most mistakes with the least accountability." In sum, over the past few weeks, the world seems to have continued its march toward our conflict scenario, and much more challenging and

uncertain conditions in 2010. In light of this conclusion, and with substantial apparent overvaluation many equity markets, we believe that investors should reduce their equity exposures and either move to higher cash holdings (we believe that 12 – 24 months of expenses is now more prudent than the traditional recommendation of 3 – 6 months) or to increased exposure to undervalued asset classes (see our Asset Class Valuation Update for more detail).

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 30 Nov 2009

<i>Australia</i>	Low Demanded Return	High Demanded Return
High Supplied Return	68%	100%
Low Supplied Return	101%	137%

<i>Canada</i>	Low Demanded Return	High Demanded Return
High Supplied Return	73%	126%
Low Supplied Return	133%	197%

<i>Eurozone</i>	Low Demanded Return	High Demanded Return
High Supplied Return	50%	85%
Low Supplied Return	84%	124%

<i>Japan</i>	Low Demanded Return	High Demanded Return
High Supplied Return	89%	144%
Low Supplied Return	156%	223%

<i>United Kingdom</i>	Low Demanded Return	High Demanded Return
High Supplied Return	25%	62%
Low Supplied Return	58%	101%

<i>United States</i>	Low Demanded Return	High Demanded Return
High Supplied Return	74%	138%
Low Supplied Return	150%	233%

<i>Switzerland</i>	Low Demanded Return	High Demanded Return
High Supplied Return	73%	126%
Low Supplied Return	133%	253%

<i>India</i>	Low Demanded Return	High Demanded Return
High Supplied Return	71%	168%
Low Supplied Return	206%	353%

<i>Emerging Markets</i>	Low Demanded Return	High Demanded Return
High Supplied Return	84%	179%
Low Supplied Return	127%	223%

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 **30 November 2009**.

Region	Risk Free Rate Demanded	Actual Risk Free Rate Supplied	Difference	Overvaluation (>100) or Undervaluation (<100)
Australia	2.2	2.7	0.5	95
Canada	2.8	1.6	-1.2	112
Eurozone	2.9	1.6	-1.3	113
Japan	2.8	2.0	-0.8	108
United Kingdom	2.8	0.5	-2.4	126
United States	2.5	1.2	-1.3	113

Note that in this analysis we have conservatively used 1%, rather than our normal 2%, as the rate of time preference. This is consistent with recent research findings that as

investors' sense of uncertainty increases, they typically reduce their time preference discount rate – that is, they become less impatient to consume, and more willing to save (see, for example, “Uncertainty Breeds Decreasing Impatience” by Epper, Fehr-Duda, and Bruhin).

Finally, we also recognize that certain structural factors 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 30 November 2009

	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	2.69%	2.96%	5.65%	5.27%	-0.38%	3.64%	2.52%
Canada	1.59%	2.40%	3.99%	3.22%	-0.77%	7.66%	1.61%
Eurozone	1.65%	2.37%	4.02%	3.15%	-0.87%	8.73%	1.48%
Japan	1.96%	0.77%	2.73%	1.26%	-1.47%	15.50%	-0.69%
UK	0.48%	3.17%	3.65%	3.52%	-0.13%	1.26%	3.03%
USA	1.23%	2.93%	4.16%	3.20%	-0.96%	9.73%	1.94%
Switz.	1.60%	2.03%	3.63%	1.85%	-1.78%	18.90%	0.25%
India	1.60%	7.57%	9.17%	7.80%	-1.37%	13.50%	6.10%

*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 a period of deflation is a distinct possibility in many countries, particularly over the next 12 months. In this case, many nominal return bonds might in fact be undervalued today, over a shorter time horizon. To help readers to put this in perspective, we also include in the table above the average annual inflation rate implied by the 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).

This analysis also raises the issue of how long a period of deflation might last, and how deep it might be, particularly given the unprecedented levels of money supply increase and fiscal deficit expansion that have been undertaken in many countries in response to the worst downturn since the Great Depression. History suggests that over the long-term, they are likely to result in higher rates of inflation. As we like to point out, in the absence of public policy interventions, overindebtedness by private borrowers typically results in widespread bankruptcies, and deflation caused by the accelerating liquidation of collateral. In contrast, overindebtedness by governments more often results in some combination of inflation and exchange rate depreciation (e.g., look at the history of Argentina). 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 **30 November 2009**, the AAA minus 10 year Treasury spread was 1.81%. The AAA minus BAA spread was 1.19%. Since these distributions are not normal (i.e., they do not have a “bell curve” shape), we take a different approach to putting them in perspective. Over the past twenty three years, there have been only 634 days with a higher AAA spread (5.45% of all days) and 1,083 days with a higher BAA spread

(9.3% of all days in our sample). Note that these spreads increased over the last month, which is consistent with our conclusion that the market has raised the probability of a return to the High Uncertainty Regime. Clearly, 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.

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 30 November 2009

	To AUD	To CAD	To EUR	To JPY	To GBP	To USD	To CHF	To INR
From								
AUD	0.00%	-2.05%	-2.12%	-4.01%	-1.75%	-2.07%	-3.42%	2.53%
CAD	2.05%	0.00%	-0.07%	-1.96%	0.30%	-0.02%	-1.37%	4.58%

	To AUD	To CAD	To EUR	To JPY	To GBP	To USD	To CHF	To INR
EUR	2.12%	0.07%	0.00%	-1.89%	0.37%	0.05%	-1.30%	4.65%
JPY	4.01%	1.96%	1.89%	0.00%	2.26%	1.94%	0.59%	6.54%
GBP	1.75%	-0.30%	-0.37%	-2.26%	0.00%	-0.32%	-1.67%	4.28%
USD	2.07%	0.02%	-0.05%	-1.94%	0.32%	0.00%	-1.35%	4.60%
CHF	3.42%	1.37%	1.30%	-0.59%	1.67%	1.35%	0.00%	5.95%
INR	-2.53%	-4.58%	-4.65%	-6.54%	-4.28%	-4.60%	-5.95%	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 **30 November 2009**: 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	5.2%	0.2%	5.4%	2.7%	3.0%	5.7%	106%
Canada	6.7%	0.2%	6.9%	1.6%	3.0%	4.6%	65%
Eurozone	4.5%	0.2%	4.7%	1.6%	3.0%	4.6%	99%
Japan	7.5%	0.2%	7.7%	2.0%	3.0%	5.0%	64%
Switzerland*	3.7%	0.2%	3.9%	1.6%	3.0%	4.6%	118%
U.K.	4.1%	0.2%	4.3%	0.5%	3.0%	3.5%	80%
U.S.A.	4.5%	0.2%	4.7%	1.2%	3.0%	4.2%	89%

**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 **30 November 2009**:

Commodity	2009 DJAIG Weight	Current Status
Crude Oil	13.8%	Contango
Natural Gas	11.9%	Contango
Gold	7.9%	Contango
Soybeans	7.6%	Contango
Copper	7.3%	Contango
Aluminum	7.0%	Contango
Corn	5.7%	Contango
Wheat	4.8%	Contango
Live Cattle	4.3%	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 fallen to 1.23% from 1.60% last month 2.83% two months ago, and 3.10% 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 funds portfolio of futures contracts back to their target commodity weightings as prices change over time. This is analogous to an equity index having a more attractive risk/return profile than many individual stocks. This rebalancing return will be higher to the extent that price volatilities are high, and the correlations of price changes across commodities are low. Historically, this rebalancing return has been estimated to be around 2% per year, for an equally weighted portfolio of different commodities. However, as correlations have risen in recent years, the size of this return driver has probably declined – say to 1% per year.

So, to sum up, the expected supply of returns from a commodity index fund over a given period of time equals (1) the current yield on real return bonds, reduced by the percentage of funds used to purchase the futures contracts; (2) expected roll yields, adjusted for commodities' respective weights in the index; (3) unexpected spot price changes; and (4) the expected rebalancing return. Of these, the yield on real return bonds can be observed, and we can conservatively assume a long-term rebalancing return of, for example, 1.0%. These two sources of return are clearly less than the demand for returns that are equal to the real rate plus a risk premium of, say, 3.0%. The difference must be made up by a combination of roll returns (which, given the current shape of futures curves, are likely to be negative in the near term) and unexpected price changes, due to sudden changes in demand (where downside 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 **30 November 2009** closing value of 86.49 was .32 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 and clean fuels, both of which should eventually boost demand for commodities (and indirectly boost economic growth in commodity exporting countries like Australia and Canada). The third is that the continued fall in the value of the U.S. dollar versus other currencies will accelerate, causing investors to increase their holdings of commodities as confidence in fiat currencies wanes. 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

Growth Driver	Assumption
	widely for different types of timber investment (with softwoods and timber located in tropical countries delivering the highest growth, and hardwoods and timber in more temperate climates delivering the slowest growth rates). We have also changed our valuation model to assume a constant mix of product grades, to present a better approximation for timber as a global asset class.
Harvesting rate	As a long term average, we assume that 5% of tree volume is harvested each year. As a practical matter, this should vary with timber prices and the REITs prevailing dividend level. So 5% is a “noisy” long-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 NCRIF 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 NCRIF 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 **30 November 2009** 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)	5.10%
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>6.10%</u>
Real Bond Yield	1.23%
Plus Risk Premium for Timber	3.00%

Equals Average Annual Real Return Demanded	<u>4.23%</u>
Ratio of Returns Demanded/Returns Supplied Equals Valuation Ratio (less than 100% implies undervaluation)	<u>62%</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 **30 November 2009**, the VIX closed at 24.37. To put this in perspective, only 978 days, or 20.4% of our sample had higher closing values of the VIX. In the short term – say, over the next 12 months -- this high (by historical standards) level of implied volatility may prove to be too low, if investors’ hopes for a fast return to normalcy 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, at the end of **November 2009** 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*
30 November 09

<i>Economy</i>	Bottoming	Strengthening	Peaking	Weakening
<i>Interest Rates</i>	Falling	Bottom	Rising	Peak
<i>Style and Size Rotation</i>	Small Growth (DSG) 2.33%	Small Value (DSV) 2.44%	Large Value (ELV) 7.16%	Large Growth (ELG) 8.29%
<i>Sector Rotation</i>	Cyclicals (RXI) 6.12%	Industrials (EXI) 7.16%	Staples (KXI) 10.09%	Utilities (JXI) 2.89%
<i>Bond Market Rotation</i>	Higher Risk (HYG) 6.91%	Short Maturity (SHY) 0.97%	Low Risk (TIP) 6.01%	Long Maturity (TLT) 0.99%

End of 2009 Review: Learning From the Past, Anticipating the Future, and Adapting Quickly in the Present

After two of the most difficult and challenging years many of us can remember, we would like to step back and share with you what is on our mind as we head into 2010. One of the points we continually emphasize is the need to learn from the past, anticipate the future, and (given that we can only imperfectly perform the first two tasks), prepare ourselves to adapt quickly as our situation evolves – often in ways that surprise us. In this review, we'll use that framework to organize our thoughts.

Learning from the Past

Clearly, all of us have learned many lessons over the past two years. Too often, they were learned the hard way, confirming the old adages that experience is a

tough teacher, and that “learning from experience” is synonymous with “making mistakes.” From our perspective, the good news is that the events of the past two years have sharply boosted interest in the study of markets as the disequilibrium systems we experience every day. This research is occurring at both the macro level (e.g., the renewed interest in the writings of Minsky and the Austrian school of economists) and the micro level, with its focus on agent based modeling, neurobiological drivers of individual behavior, and social network effects. An excellent example of this work is a new paper by Thomas Brennan and Andrew Lo, on “The Origin of Behavior”, in which the authors “propose a single evolutionary explanation for the origin of several behaviors...including risk aversion, loss aversion... and diversification.” Three other short but very interesting papers include “Stabilities and Instabilities in the Macroeconomy” by Axel Leijonhufvud, “Top Down Versus Bottom-Up Macroeconomics” by Paul De Grauwe, and “The Economy Needs Agent Based Modeling” by J. Doyne Farmer and Duncan Foley. We will continue to do our best to keep our readers up to date with the progress of this research, as we believe it has and will continue to provide a rich source of insights (and, we hope, improved foresight) about the complex processes that generate the asset prices we observe. For us, the key takeaways from this research over the past two years have been the critical role of the amygdala, and the fears of loss, uncertainty, and social isolation it can produce, the connection between these fears and the strength of network effects, the trade-offs between different types of regret (errors of commission versus omission), and the tradeoff between regret and social envy.

A second major lesson from the past two years is the implications of the sharp increase in the amount of assets under management and market volume directed by quantitative trading strategies. That these strategies have become extremely sophisticated is beyond doubt. For example, Dow Jones recently introduced a full suite of customizable algorithmic and quantitative trading solutions that are based on real time analysis of its news feeds. As Dow Jones notes in its marketing literature, “This powerful package allows institutions to build, test and deploy algorithmic trading strategies that analyze and react to news that has an immediate impact on the prices

of equities, derivatives, forex and fixed-income instruments.” To put this in perspective, the ability of machines to profitably exploit human traders’ departures from perfect information and perfect rationality has never been greater. My very strong sense is that most of us underestimate the impact that algorithmic trading has had on markets. For example, John Hussman recently wrote the following: “Clearly, I was wrong about the extent to which Wall Street would respond to the ebb-and-flow in the economic data – particularly the obvious and temporary lull in the mortgage reset schedule between March and November 2009 – and drive stocks to the point where they are not only overvalued again, but strikingly dependent on a sustained economic recovery and the achievement and maintenance of record profit margins in the years ahead. I should have assumed that Wall Street’s tendency toward reckless myopia – ingrained over the past decade – would return at the first sign of even temporary stability. The eagerness of investors to chase prevailing trends, and their unwillingness to concern themselves with *predictable* longer-term risks, drove a successive series of speculative advances and crashes during the past decade – the dot-com bubble, the tech bubble, the mortgage bubble, the private-equity bubble, and the commodities bubble. And here we are again.” We completely agree with his sentiments; what we’re curious about is the extent to which algorithmic trading is responsible for the rapid run-up in asset class prices we have seen in 2009. On the one hand, this year’s market behavior is consistent with the results of agent based financial market models, in which each trader utilizes a different price forecasting and decision algorithm, and these are updated on the basis of their performance. Once the percentage of agents utilizing trend-chasing (momentum) rather than fundamental value-based algorithms passes a tipping (phase change) point, market volatility and the frequency of bubbles and crashes sharply increases. Given the way many managers’ incentives are structured in the investment industry, with bonuses and increases in assets under management both substantially based on this year’s performance, we shouldn’t be surprised to see widespread use of momentum strategies and much more volatile market – call it Keynes’ beauty contest on (algorithmic) steroids.

This only reinforces another lesson we've learned over the past two years: while "buy, rebalance, and hold" is an excellent long-term strategy when financial markets are operating in their normal (close to equilibrium) regime, this isn't the case in the High Uncertainty and High Inflation Regimes. These are both characterized by substantial disequilibrium which can easily give rise to dangerous asset class overvaluations. Under these circumstances, it is absolutely critical for investors to pay attention to valuation levels, and, more broadly, to risk management. The fact that the fundamental value of an asset class can only be estimated with some degree of uncertainty does not undermine this point. As we demonstrate in our monthly equity markets valuation update, it is possible to construct a range of fundamental valuation estimates that take uncertainty into account. And when most of these are signaling dangerous overvaluation, it is time to act. However, we also recognize that this runs straight into the decision trade-offs noted above. Most people have a stronger desire to avoid the regret caused by errors of commission (deviating too soon from the conventional wisdom, and being forced to feel envy) than by errors of omission (sticking with the herd and selling too late). It is therefore extremely hard to take action in the face of what appear to be dangerous overvaluations. As former Citibank CEO Charlie Prince famously said in July 2007, "As long as the music is playing, you've got to get up and dance." Overall, experiences over the past two years with valuation, incentives, and decision making have taught us three lessons. First, adding "automatic stabilizers" to a portfolio -- like an allocation to traded volatility products -- is an excellent way to avoid human decision making conflicts during bubbles. Second, the way investors measure and reward their own and/or their managers' performance contributes to this conflict -- it is much easier to take action to avoid large losses when you are focused on earning the long-term real portfolio return needed to achieve your goals than when your main purpose is beating an external benchmark. Finally, regular use of a consistent valuation methodology that incorporates uncertainty makes it easier to take action in the face of dangerous overvaluation.

The last big lesson the past two years have taught us is that rather than diversification as a concept, it was asset allocation models that too often failed over

the past two years. In particular, the past two years highlighted many of the shortcomings of traditional one period, mean/variance optimization models that we have written about since 1997. Our model portfolios were based on a model that included both an upside and a downside regime, during which asset classes would display different returns, volatilities and correlations. We believe this resulted in their generally delivering better results than portfolios that were based on the traditional MVO methodology, with its use of a single regime and historical averages values for key input variables. Building on this experience, our new model portfolios will be based, in part, on a new asset allocation model that incorporates three regimes (High Uncertainty, High Inflation, and Normal Times) as well as a broader range of asset classes (e.g., traded volatility products). Other firms whose opinions we respect are also moving in this direction (see, for example, an excellent new paper from Rogers Casey's Cynthia Steer on "Asset Allocation in the New World").

However, the events of the past two years have also made painfully clear just how hard it is to accurately predict the future behavior of a complex adaptive system like the financial markets. This has reinforced our belief in the enduring virtues of a portfolio that is equally weighted across a range of broadly defined asset classes. As we have noted in the past, across a range of functional currencies the equally weighted portfolio has historically delivered compound annual real returns of between 4% and 5% over long periods of time, without any need to make quite possibly erroneous forecasts. Given this, we believe that the equally weighted portfolio should be all investors' starting point, with adjustments away from it based on differences in personal preferences and confidence in one's forecasts for future regime probabilities and the behavior of different asset classes within them. Practically, this amounts to combining the equally weighted portfolio with the portfolio that emerges from our asset allocation model, with its regime assumptions and underlying simulation optimization methodology. For example, an investor who requires only a three percent compound real portfolio return to achieve his or her goals might place more weight on the model portfolio than on the equally weighted portfolio, since the former will likely have a lower volatility than the latter. An investor who requires a real return of 4% or 5% might

either be indifferent between the model and the equally weighted portfolios (suggesting 50/50 weighting), or, if they had a relatively low level of confidence in our forecasting ability, might place more weight on the equally weighted portfolio. Finally, an investor requiring 6% or 7% real returns would have no choice but to put relatively more weight on the model portfolio, as the equally weighted portfolio is unlikely to deliver these long-term returns.

Anticipating the Future

I wish I could end 2009 with an optimistic view of what lies ahead in 2010. Unfortunately, the accumulated evidence does not support that view. Across the Anglosphere, household debt levels remain stubbornly high. Along with continued fear of job loss and weak housing markets, high debt burdens will continue to hold down private consumption spending. Nor can we expect private investment to pick up the slack in economic demand caused by reduced private consumption. Businesses face considerable uncertainty on many fronts, including demand growth, tax rates, exchange rates, environmental regulations, and a rising level of trade-related tensions. Medium size and small business also face a continuing shortage of bank credit – a situation that probably won't improve in 2010, due to rising levels of problem loans, particularly in commercial real estate, but also in household mortgages (due to a new round of adjustable rate resets and recasts), leveraged buyouts, and rising business bankruptcies if the economy continues to stagnate. Unfortunately, widespread debt to equity conversion, which helped to restore Latin America's economic health in the 1980s, has yet to be seen as a solution to our current crisis. In sum, while we should expect to see continued rebuilding of business inventory levels (particularly if trade conflicts disrupt global supply chains), strong growth in business and residential fixed investment seems highly unlikely in 2010.

And what of the prospects for trade related growth, via increased exports and import substitution? In 2009, we have seen the Chinese Renminbi depreciate in lockstep with the U.S. Dollar, making exports from elsewhere in the world even less

competitive, and creating more pressure from imports on domestic producers – and domestic employment. While China has talked a good game about the need to increase domestic consumption and reduce its dependency on exports, its behavior – including continued investment in many export industries as part of its stimulus program – suggests that its primary goal continues to be the maintenance of high employment and social stability. In effect, China's exchange rate and stimulus policies have become the early 21st century equivalent of the "beggar thy neighbor" policies that prolonged the Great Depression when they triggered a sharp increase in tariffs and other trade barriers.

Moreover, as Michael Pettis recently noted ("The Difficult Arithmetic of Chinese Consumption", China Financial Markets, 5Dec09) even if it wanted to substantially increased private consumption, the challenges to accomplishing this are daunting: "What kind of consumption growth will we need for the country to rebalance? The numbers are a little worrying. If China grows by 8% a year, consumption would have to grow by a little over 11% to raise the consumption share of GDP from 35% to 36% in one year. It would have to grow by a little over 9 1/2% annually to do it in two years. Consumption, in other words, must grow substantially faster than GDP for the rebalancing even to begin to take place. This is arithmetically true because China begins the process with such a low consumption ratio. Look at it over the longer term. Just to return consumption to 40% of GDP over the next five years (and even that level is widely considered to be way too low, and probably unprecedented in the world excluding recent Chinese history), 8% average annual growth rates in GDP would require a tad under 11% annual growth in consumption. Similarly, 7% average annual GDP growth rates would require that consumption grow annually over the next five years by nearly 10%. To bring Chinese consumption in 20 years up to 50% of GDP, which is the low end for other high saving Asian countries, and far lower than any other large economy in Asia (and remember that large economies are less able to rely on exports to fuel growth than small countries), 7% annual GDP growth would require average annual consumption growth of just under 9% for twenty years. In other words while GDP growth slows significantly from its 12-13% rate of the past several years,

consumption will nonetheless have to surge at rates far in excess of the 8-9% growth rates of recent years in order for even a small, partial rebalancing to take place. I don't think I have ever seen a case in which consumption has grown at nearly that rate for any length of time. I believe if China pulled it off it would be unprecedented."

In sum, if some, albeit low, level of positive real growth is to be maintained in the economies of the U.S., Canada, Eurozone, UK, Switzerland, Japan and Australia, there appears to be no alternative to continued levels of extraordinary deficit spending by the public sector. A recent IMF staff report ("The State of Public Finances Cross-Country Fiscal Monitor: November 2009") examined the implications of this conclusion. Here is a short summary of this report's key findings: "Many advanced economies entered the crisis with relatively weak structural fiscal positions, and these have been eroded further, not only by anti-crisis measures but also by underlying spending pressures. This will raise the bar on fiscal adjustment...Government debt in advanced G-20 economies is projected to reach 118 percent of GDP in 2014, even assuming some discretionary tightening next year. Getting debt below 60 percent by 2030 will require raising the average structural primary balance by 8 percentage points of GDP relative to 2010 (10 1/2 percentage points for the headline primary balance). Action will be needed on entitlement spending, on other spending, and on revenues. Japan, the United Kingdom, Ireland and Spain are projected to require the largest fiscal adjustment. Only Denmark, Korea, Norway, Australia and Sweden among advanced economies will require little or no medium-term adjustment to keep debt stocks at safe levels. · Many G-20 economies have achieved big declines in debt ratios in the past. Improvements in the primary balance were at the core of these efforts. Faster growth can also help. Faster inflation is not an effective debt-reducing strategy: raising inflation to 6 percent for five years would erode less than one fourth of the projected trend increase in debt ratios. Fiscal deficits and government debt levels both affect interest rates. Stabilizing debt at post-crisis levels would imply higher interest rates (perhaps by 2 percentage points). Moreover, there are important nonlinearities: the impact on interest rates of each additional percentage point of debt or deficit increases as the initial debt or deficit level rises, pointing to a risk that government debt could

snowball without corrective action. This underscores the need for governments to announce credible exit strategies now, even if it is premature to begin exiting from fiscal support.”

Unfortunately, the ability of some governments, most critically in the United States, to maintain their current levels of fiscal stimulus appears to be increasingly in doubt, due to rising public levels of disappointment, distrust, and in some cases outright disgust at the results achieved by current fiscal stimulus programs. As a rising number of commentators have noted, too much seems to have been spent on avoiding layoffs of unionized public sector employees, on supporting imports and employment in other countries (notably China), on supporting more debt financed consumer spending (e.g., cash for clunkers, first time homebuyer tax credits), and on bailing out politically favored groups (e.g., autoworkers) and especially bankers who seem intent on taking ingratitude, arrogance, and conspicuous consumption to previously unimagined heights. Not enough has been spent on investments and aggressive structural changes that are critical to improving total factor productivity, and countries' ability to grow their way out of the very large government debt burdens they are rapidly building up. For example, around the world, innovative cleantech and energy companies still confront what has been termed the “financial valley of death.” In a nutshell, while traditional venture capital financing can be used to develop new technologies, there is a great shortage of financing for the large capital investments needed to scale them up. As far as traditional project finance lenders are concerned, they are still too risky. Unfortunately, existing government programs, which are often oriented towards funding R&D grants, are proving inadequate to the challenge posed by the valley of death. And while many proposals have been made for “national infrastructure banks” to bridge this gap, none have yet been enacted into law. For an example of government's unwillingness, thus far, to aggressively pursue structural reforms that are critical to higher productivity, consider education. With some notable exceptions (e.g, the province of Alberta in Canada), few governments have been willing to aggressively challenge teachers unions in order to implement substantial reforms to improve the quality of public education, at a time when the majority of

voters see that it is critical to improving human capital quality, productivity, and economic growth. The same can be said for taking on the public sector unions, in order to provide more flexibility to maximize the value that governments can deliver for a given level of taxes and other revenues – thus far, most political leaders have been unwilling to take this step, while unions have usually aggressively resisted the relatively few changes that have been proposed.

As frustration with governments' response to the current crisis mounts, a growing chorus of commentators is asking whether the current political leadership in many countries is up to the challenges that lie ahead – and much of the middle class undoubtedly shares their doubts. When was the last time you heard an expression of great confidence that things would rapidly improve, if only the opposition party was running the show? Comments that Walter Russell Mead (one of our favorite authors) posted on his blog on 28Nov09 well summarize our perception of the current situation: “More and more I wonder if our experts and political classes are serious about anything. Whether it's the U.S. Budget deficit, the looming crisis in healthcare, the global economic imbalance between surplus and deficit countries, the coming crisis with Iran, or the way that current U.S. policy systematically sacrifices the interests of youth to protect the status quo and the interest of the old, I see a lot of talk and handwringing, but little if any real movement...We are living in a time of revolutionary social and economic change and we are governed by a generation of time-serving mediocrities.”

As we said at the beginning of this article, we're not optimistic about what 2010 will bring to the global political economy. Tensions are rising between China and the rest of the world, and increased conflicts over exchange rates and trade seem impossible to avoid. In his 8Dec09 column in the *Financial Times*, Martin Wolf starkly described the most likely outcomes we face: “What would happen if [countries running current account deficits] sustained domestic demand with massive and open-ended fiscal deficits? Answer: A wave of fiscal crises [which, as we have noted in the past, are often accompanied by currency crises and high inflation]. And what would happen if deficit countries slash spending relative to incomes while their trading partners [i.e.,

China] remain determined to sustain their own excess of output over incomes, and export the difference? Answer: A depression.”

Unfortunately, the increasing conflict between the U.S. and China (see, for example, a new paper by Niall Ferguson and Moritz Schularick, “The End of Chimerica”) will likely be non-linear in its development and unpredictable in its effects. In the U.S. and Europe, it feeds on long-held doubts among labor unions and much of the middle class about the benefits of globalization and outsourcing. With sharply higher unemployment, protectionism becomes ever easier to support. But when and if those steps are taken by Western governments, they run the risk of both destabilizing China due to falling exports and rising unemployment, and fanning the flames of the resurgent nationalism that has been building in China over the past decade (a trend which is further reinforced by the substantial surplus of single men over single women, a legacy of China’s one child policy and preference for male progeny). Elsewhere, there is no shortage of potential international wildcards that could adversely affect events in 2010, including the future political stability of Mexico, Egypt, and Pakistan; the actions of the Ahmadinejad regime in Iran, and the likely exhaustion of Israel’s patience with Iran’s efforts to continue its nuclear weapons development program; Russia’s tendency towards brinkmanship in its effort to regain its lost power (which may yet be offset by a weakening economy, falling energy prices, and the need to restore the confidence of foreign investors in order to grow its economy); Japan’s continued struggles with deflation, a very high government debt/GDP ratio, a rapidly ageing population and slowing growth; and the unpredictable evolution of the H1N1 influenza virus. Perhaps it is the Irish in me (and the accompanying faith in Murphy’s law), but there seem to be a lot of things that could go wrong next year. Put differently, after reviewing the current trends and uncertainties, try to construct a scenario that would deliver smooth economic sailing, rising asset prices and low volatility in 2010 (e.g., a revaluation of the Renminbi versus the USD, a sharp increase in domestic consumption in China, widespread debt/equity conversions and/or bankruptcies in the United States and elsewhere to reduce the debt burden, strong growth in emerging markets to support increased North American and European exports, a rise in

business investment and productivity, etc.). Then ask yourself how plausible your story seems (for another good recent analysis of the challenges we face, see “A Vicious Cycle of Manias, Crashes and Asymmetric Policy Responses – An Overinvestment View” by Hoffman and Schnabl). While we may all continue to hope for the best, prudence demands that we plan for a less pleasant future.

Given this outlook, in 2010 we expect that we will be delving deeper into what we have termed the “conflict scenario”, examining the critical uncertainties that will drive the next phase change. We have already thought about this a great deal; it has preoccupied our thinking for quite some time. At this point, we are leaning towards productivity growth and political legitimacy as the key uncertainties we face. For example, a sharp increase in productivity growth and retention of political legitimacy by the major governments in the world could lead to a relatively rapid recovery, though one that could easily include a period of significantly higher inflation, due to central banks’ under-reaction to improving conditions in the real economy. In contrast, a failure to increase productivity growth, along with other policy mistakes, could create a situation in which the very legitimacy of many governments was in peril. As we have noted in the past, we believe that neither an integrated global economy nor representative democracy are natural equilibrium conditions; in our reading of history, the more common state of affairs has been relatively closed blocs that were often comprised of authoritarian or corporatist governments. We admit to being haunted by events at the turn on the 20th century, and the fear that we are once again in 1910.

Adapting Quickly in the Present

Given the multiple uncertainties we currently face, and what we believe is a significantly greater risk of difficult times compared to the chances of a return to stable growth and normal financial markets, the ability to adapt quickly will likely be critical to investors’ success in 2010. This involves not only maintaining a well-diversified portfolio, but also paying attention to valuation levels, being willing to reduce exposures when asset classes appear to be dangerously overvalued (as, for example,

many equities appear to be today – see this month’s Asset Class Valuation Update for more detail), and ensuring that one’s liquid reserves are large enough (we think the old rule of 3 to 6 months’ expenses should be raised to 12 – 24 months in the current environment) and include a mix of currencies as well as physical gold, or ETF shares that allow conversion into physical gold). The ability to adapt quickly also depends on having a thesis about how different asset classes will perform under different return/risk/correlation regimes, and about the regime we are likely to be in over the next one to three years. Along with medium-term scenario analysis, short-term regime analysis is a critical part of our journal each month.

The goal of quick adaptability to surprising changes also raises questions about the asset classes to include in our model portfolios. Obviously, this includes newly introduced traded volatility products; however, it also includes other asset classes that perform best under the High Uncertainty Regime, such as short-term U.S. Treasury Bonds, as well as short-term government bonds issued by countries such as Australia, Norway, Sweden, and possibly Canada that seem to be well positioned to weather future uncertainties (because of some combination of resource endowment, manageable levels of debt and liabilities for future health care and pension obligations, and strong fiscal policy). A separate allocation to gold as a stand-alone asset class remains a possibility; however, it depends on our ability to develop a fundamental valuation model for this asset class that we find satisfactory.

Improving adaptability also involves combining asset classes where that is appropriate. It is clear that this is happening in equities, where a growing number of investors are combining various country equity allocations into a single allocation to developed market equities (for more on the logic behind, this, see “Globalization and Asset Prices” by Bekaert and Wang, “Stock Market Comovements and Industrial Structure” by Dutt and Mihov, and “Globalization of Equity Policy Portfolios” by Subramanian, Nielsen, and Fachinotti). We will also take this approach in 2010, but refrain from going a further step to a single allocation to global equities. As we have repeatedly noted, we think the differences between institutional and economic conditions in emerging and developed markets are still large enough to warrant their

treatment as separate asset classes. With the introduction of new index products that enable investors to make allocations to developed market property securities, we will also likely consolidate our current allocations in this area too. As is true of developed equities, both research and recent returns have shown that the underlying drivers of returns are increasingly similar across different markets for listed commercial property securities. Finally, as we describe in this month's Product and Strategy Notes, depending on the availability of new investable products, we are likely to add direct oil and gas investments as an asset class, as the evidence shows a growing divergence between their behavior and that of long-only commodities index products based on continuously rolled futures contracts.

Last but certainly not least, it is also clear that the need for greater adaptability in the face of heightened and prolonged uncertainty will present substantial challenges to the business models of many financial advisers. And in some countries (e.g., Australia and the UK), this challenge comes at the same time as profound regulatory changes that will deeply affect the industry (e.g., a move to universal fiduciary requirements, and the elimination of commissions). There is no doubt that the number of potential clients needing financial advice to help weather the storms on the horizon has gone up exponentially. The challenge remains finding profitable ways to define and deliver it. We believe that many governments will eventually respond to this challenge by changing workers' so-called "default options" – for example, instituting mandatory defined contribution savings plans on the lines of Australia's Superannuation Plans, default allocations to a mix of asset class index products, as in the case of the U.S. Government's Thrift Savings Plan (TSP) for its employees, and requiring that at least a portion of accumulated balances in these plans be converted to annuities upon retirement. We hope that these changes will also create new opportunities for advisers to leverage technology to profitably deliver simple financial planning solutions to, and maintain ongoing value added relationships with a larger number of clients, most of whom we believe will continue to resist providing private financial information to anonymous websites. In short, a relationship with a trusted financial adviser who can provide them with a sense of understanding, direction and reassurance, will continue

to be what most people desire, perhaps more than ever before if we experience a prolonged period of High Uncertainty. The challenge will be how to match evolving technological possibilities with changing client needs to profitably seize this opportunity.

Product and Strategy Notes

Four Gift Book Ideas

Over the course of a year, we read a lot of investment related books; as we repeatedly stress, we strongly believe that nobody has a monopoly on insight, and that the best foresight comes from combining forecasts that are based on different perspectives and methodologies. With that in mind, here are four books we can enthusiastically recommend to people who are struggling with their holiday gift list.

Gillian Tett is one of our favorite *Financial Times* writers, not the least because she has a PhD in social anthropology, which more often than not translates into unique insights on the workings of financial markets and organizations. In Fool's Gold, Tett tells the story of the invention of credit default swaps at JP Morgan, the careers of the people involved, and the consequences for financial markets, including the events of 2008. We were particularly struck by her description of how the JP Morgan bankers could not believe that other banks were “playing so fast and loose” with the risks inherent in products like collateralized debt obligations and credit default swaps. What other banks appeared to be doing was “cognitively off the map in their culture.” I went through a similar experience years ago at a company that competed with Enron. I also know and respect the old JP Morgan culture built by Dennis Weatherstone, whose famous admonition, “if you don’t understand it, don’t do it” has more than stood the test of time. All of Tett’s descriptions of the anguish (other banks were earning much more money), self doubt (what are we missing?) and disbelief (we don’t appear to be missing anything; can this really be happening?) ring painfully true, and it should be required reading for anyone about to start a career on Wall Street or in the City.

Justin Fox's book, [The Myth of the Rational Market](#) is a perfect counterpart to Tett's, in that it presents (in the tradition of Peter Bernstein's books) an excellent and very readable summary of the major ideas (and the conflicts between them) that ultimately led to the crash of 2008. If you're looking for a book that will give you an excellent grounding in this area, this is it.

For years, Bill Bernstein has been one of our favorite writers. After a career as a neurologist, he developed a deep interest in investing, and for a number of years shared his insights quarterly at www.efficientfrontier.com. More recently, he has gone into the money management business, while also writing a series of books. His latest is [The Investor's Manifesto](#). Bill's writing is always clear and frequently entertaining as well as informative. In this book, however, he gives full voice to his anger and resentment at the way too many investors have been treated by the asset management industry – a view we share (anyone who subscribes to our journals will see a lot of familiar points in Bill's book). Like us, he believes that an individual investor can, even without years of study, can still become sufficiently well-informed to significantly raise the probability of achieving his or her long-term financial goals. If you have a compulsive active investor on your list, this just might be the perfect gift.

Finally, anyone who reads our publications knows we are very big fans of agent based modeling and social network analysis, and believe that they will play a key role in the development of more realistic disequilibrium theories that better describe the real behavior of financial markets. In [Connected: The Surprising Power of Our Social Networks and How They Shape Our Lives](#), Christakis and Fowler (the former from Harvard Medical School, and the latter from the University of California, San Diego) provide an extremely readable introduction to this important topic.

Muni Market Update

In our September 2009 issue, we warned of what we termed “the coming muni market train wreck.” Since then, many more articles have appeared on this issue, to which we call your attention. Just in November, we saw (1) John Judis in *The New Republic*,

“End State: Is California Finished?”; (2) *Barron’s* writing about Jim Chanos’ doubts about munis (“Shortseller: Dump Munis”, 9Nov09 issue); (3) *The Pew Center on the States* publishing “Beyond California: States in Fiscal Peril”; (4) *Governing Magazine* (17Nov09 issue) on “The Ticking Fiscal Clock”; and (5) William Voegli’s article in the 29Nov09 *City Journal* on “The Big Spender, High Taxing, Lousy Service Paradigm.” It therefore came as no surprise to see *The Bond Buyer* (on 11Nov09) attempt to mount a defense of the industry (“Are Default Worries Unfounded? Analysts Say Risks Overblown”). In essence, their argument is that “while governments may have to cut costs, raise taxes, or tap reserves, analysts say the hype about large-scale municipal government defaults is overblown.” However, *The Bond Buyer* article did note that “George Hempel’s seminal 1971 study, ‘The Postwar Quality of State and Local Debt,’ found municipalities defaulted en masse in the latter stages of the Great Depression.” As we noted before, we don’t think that, given the size of the fiscal problems facing many states, the amount of cost cutting and tax raising that is politically possible in many jurisdictions is not sufficient to prevent serious problems from developing in the market for U.S. municipal bonds.

As recent events in California, New Jersey, New York and many other states have demonstrated, any attempt to significantly cut costs immediately runs into opposition from the very strong alliance between unionized public sector workers, the large number of people who benefit (as either clients or employees of service and government organizations) from the vast spending on entitlement and social welfare programs, and the politicians who depend on them for campaign contributions and other electoral support. This has led to many initiatives, and even more calls, to solve the problem by “raising taxes on the rich.” However, as many commentators have pointed out, (1) the potential incremental revenue that would be raised even from draconian increases is not sufficient to solve the fiscal problems facing the states; and (2) the federal government is also planning to increase taxes on people with high incomes (\$200,000 and above), which, all else being equal, will make them more sensitive to any increase in state level taxes (see, for example, Steve Malanga’s 7Oct09 article on RealClearMarkets.com, “Tax the Rich? How’s That Working?”, for

evidence that such efforts have already failed to produce their anticipated revenue increases). We appreciate why many people who have made their careers in the municipal securities market find it hard to conceive of a crisis that would lead to widespread defaults. However, we have been around the block enough times to remember LDC bankers who couldn't conceive of widespread sovereign defaults (e.g., Walter Wriston's famous observation that "countries don't go broke"), energy investors who couldn't conceive of oil prices falling again to \$10/barrel, bankers who thought it made sense to lend to (very) highly leveraged buyout companies; and, in the most recent rendition of this timeless story, too many real estate investors who didn't believe that house prices could decline by 20% or more. So we're sticking with our view that severe problems lie ahead in the U.S. municipal securities markets.

Commodity Futures vs. Direct Oil and Gas Investments

Over the past two years, we have frequently noted our concern that the influx of passive investment dollars into long-only, futures based commodity index funds could be detrimentally affecting the underlying return generating process. To quickly recap, in a long-only, futures-based commodity index fund, the return generating process is composed of four parts: (1) the return on collateral, which is generally equal to a short-term U.S. Treasury or inflation-indexed bond (this collateral reflects the fact that futures can be purchased for much less than 100% of their face value); (2) the so-called "diversification return" from investing in futures whose returns have low correlations with each other (e.g., agricultural, metals and energy products); (3) the "roll return" from selling a maturing futures contract at a higher price than the cost of purchasing a longer-dated futures contract to replace it; and (4) changes in the price of the underlying commodity that were not anticipated at the time the a futures contract was purchased (i.e., surprise price changes). Our concerns are (1) that the inflow of funds into commodity index products has increased the correlation between different futures market segments (thereby reducing the diversification return); (2) that higher investment inflows in aggregate, and a greater percentage of momentum driven

investment within that, has put more upward pricing pressure on longer-dated futures contracts (thereby either reducing the roll return or causing it to become negative, due to a “contangoed” futures curve); and (3) that higher investment inflows, by structurally increasing the upward pressure on futures prices, have reduced the probability of positive price surprises and increased the probability of negative price surprises.

One of the approaches we have implemented to deal with this situation is a shift from long-only funds to implement our model portfolios’ allocation to commodities, and their replacement by long/short funds based on the S&P Commodities Trend Indicator Index. Long/short commodity funds can profit by selling futures contracts when they appear to be overpriced, and by buying them when they appear to be underpriced. A second approach we have taken has been the exploration of the portfolio impact of including direct oil and gas investments of some type (as opposed to investments based on futures contracts). It is apparent that we aren’t the only people thinking along these lines. For example, in addition to the FCG ETF (which holds an equally weighted portfolio of equities in natural gas producers), Jeffries recently filed a registration statement for a new ETF based on natural gas producers, and another based on small cap companies that derive at least seventy five percent of their revenue from oil and natural gas.

In our analysis, we have used changes in real natural gas and oil prices as our proxy for the returns direct investments in oil and gas production companies will generate. Strictly speaking, it is obvious that there is usually not a one-to-one correspondence between price changes and returns; in fact, the return function is usually non-linear, with accelerating negative returns below a breakeven point, and accelerating positive returns above it. This is due to the fact that energy production is a very capital intensive business, with a relatively high percentage of fixed to total costs. In addition, the “E” in “E&P” can also affect returns, as exploration is unavoidably risky – though less so in more established plays, and more so in “frontier” type plays. So while not perfect, comparing changes in real oil and natural gas prices to real returns on different asset classes should still provide some valuable insights into the potential portfolio impact of direct oil and gas investments. The following table

is based on rolling 12 month real returns (to eliminate the impact of autocorrelation) between 1991 and 2008.

Rolling 12 Month Real USD Returns, 1991-2008

	Avg. Annual Return Premium over Real Return Bonds	Standard Deviation of Real Returns	Correlation of Asset Class Return with Change in Real Gas Price	Correlation of Asset Class Return with Change in Real Oil Price
Real Return Bonds	0.00%	6.52%	0.38	0.17
Investment Grade Bonds	0.91%	3.77%	(0.10)	(0.48)
Foreign Govt Bonds	2.11%	9.41%	(0.07)	(0.09)
Developed World Property	4.61%	14.94%	(0.25)	(0.18)
Commodities (DJAIG)	1.72%	11.74%	0.49	0.69
Timber (NCREIF)	7.32%	7.34%	(0.06)	(0.14)
Gold	-0.16%	10.86%	0.01	0.34
Developed World Equity	3.11%	17.06%	(0.10)	0.03
Emerging Equity	8.28%	22.28%	(0.03)	0.28
Uncorrelated Alpha*	4.30%	2.61%	0.12	0.01
Volatility (VIX)	1.32%	25.27%	0.03	0.01
Real Gas Price	8.22%	42.81%	1.00	0.46
Real Oil Price	6.69%	22.38%	0.46	1.00

* 50% Equity Market Neutral and 50% Global Macro

As you can see, direct oil and gas investments were quite risky, in terms of the standard deviation of real price changes compared to the standard deviation of real asset class returns. However, risk is also a function of the degree to which returns on two investments are correlated. In this case, direct oil investments, and especially direct gas investments, had very low correlations with other asset classes, and, interestingly, with each other as well. The latter should not be too surprising, as the markets for these two commodities are quite different. In the case of oil, the vast majority of it is used in transportation applications. In the case of gas, demand is divided (roughly evenly) between electricity generation, residential and commercial space and water heating, and industrial uses. Hence, while oil is heavily exposed to economic growth, a substantial portion of the returns on gas come from exposure to weather (which drives peak electricity generation and peak space heating demand), which has no correlation with the demand drivers for other asset class returns.

On the other side of the equation, the supply systems for oil and gas are also quite different. Oil is a globally traded commodity, with most supply coming from areas with high political uncertainty. In contrast, the major markets for natural gas are still

largely regional (as a proportion of demand, total shipments of liquefied natural gas are dwarfed by oil shipments). Hence, security of supply is quite strong in North America, moderately strong in Asia (though with some exposure to the Middle East, in addition to Australia, Indonesia, and in the future, Papua New Guinea), and weakest in Europe, with its dependence on gas supplies from Russia and North Africa. More broadly, future demand for oil faces uncertainty from rising fuel efficiency and emissions standards, competition from new fuels (e.g., biofuels and electric vehicles) and uncertain supply conditions in key producer countries (see the ongoing debate over whether global oil production has peaked). In contrast, gas supplies have sharply increased in recent years due to both more offshore finds and the onshore development of new techniques to economically produce gas from previously untapped shale reservoirs, while future gas demand seems poised to increase in a world of tighter standards on emissions from coal fired electric generating stations.

Last but not least, average annual real oil and gas price changes were significantly positive, and, qualitatively, in line with the risk each presented (in terms of both standard deviation and correlation with returns on other asset classes). We suspect it won't be too long before someone registers an ETF that takes a long position in oil and/or gas production companies, and a short position in the overall market, to provide an equity-based uncorrelated alpha strategy that is primarily driven by changes in real oil and/or gas prices. From what we have seen so far, such a product would likely be a valuable addition to many portfolios.

Thought-Provoking New Research on Alpha/Beta Allocation

We have repeatedly noted the potential mathematical benefits that an allocation to uncorrelated alpha strategies can bring to a portfolio. These are actively managed strategies whose returns have low or no correlation with the returns on the broad asset class index products that compose most of the portfolio. Particularly when high compound real returns are required to achieve an investor's long-term goals, an allocation to uncorrelated alpha can raise the probability of success. In a new paper

(“Simple and Optimal Alpha Strategy Selection and Risk Budgeting”), Robert Scott of Schroders Investment Management provides an excellent overview of this issue, and proposes a simple metric to use in thinking about it – the active strategy’s Information Ratio divided by the portfolio’s beta strategy Sharpe Ratio, compared to the correlation of active (alpha) to passive (beta) returns. As you recall, an active strategy’s Information Ratio is its average return less the return on the relevant benchmark (i.e., its average alpha) divided by the standard deviation of this so-called “Tracking Error.” The Sharpe Ratio is simply the weighted average return of the portfolio’s allocation to broad asset classes, divided by their standard deviation. The Sharpe Ratio can be expressed in terms of either absolute returns, or the spread of returns over a risk free rate, such as real return bonds. Scott’s paper is an excellent piece of work, and we strongly recommend it to our readers.

However, all of this analysis – ours and Scott’s – depend on a crucial assumption: that the selected active strategies will continue to deliver their expected (positive) returns, with their expected tracking error, in the future. Over the years, a number of excellent books and articles have described the challenges this involves. In Active Portfolio Management, Grinold and Kahn described how a manager’s potential alpha is a function of a manager’s forecasting skill and the breadth of his or her strategy – that is, the number of applications of that skill over a given period. In “Portfolio Constraints and the Fundamental Law of Active Management”, Clarke, de Silva and Thorley showed how potential alpha is limited by constraints put on a portfolio – e.g., restrictions on shorting, concentration, and/or turnover. Collectively, these constraints aggregate to the “transfer coefficient”, which measures the percent of potential alpha that is actually available for realization. In “Increasing Your Odds”, Ramkumar and Waring remind us that “not only is your evaluation of a manager’s forecasting skill important, but equally critical is your skill in evaluating active managers.” We know that past performance is a poor predictor of future results, and may be overstated due to self-reporting or survivorship bias in the data (e.g., see “Hedge Funds: Pricing Controls and the Smoothing of Self-Reported Returns” by Cassar and Gerakos for a good new paper on this issue). We also know that active

managers charge higher fees than index managers, and that active managers have higher trading volumes than index funds (which reduces returns due to higher transaction costs as well as higher taxes for investors subject to tax). For an excellent new paper on this point, see “Hidden Cost of Active Management” by Mark Kritzman of Windham Capital Management.

Given all these concerns, a realistic assessment by an investor of his or her own ability to identify skilled active managers is critical (or, if this function is delegated, than his or her ability to identify advisers who are truly skilled at manager selection). Last but not least, we have to assess active managers’ likely skill levels and alpha potential in light of the body of research on the extreme difficulty of forecasting the behavior of complex adaptive systems like the financial markets. In our view, the overall conclusion of this research is that one must very carefully weigh the likelihood of identifying active managers who can consistently deliver positive alpha after fees and taxes against the mathematical benefits uncorrelated alpha can theoretically provide to a portfolio. For an excellent theoretical overview that supports this cautious approach in situations where the difference between skill and luck is hard to determine, see one of our all-time favorite papers, “The Market for Quacks” by Ran Spiegler.

In light of these concerns, we have set a maximum limit of ten percent on the allocation to uncorrelated alpha strategies in our model portfolios. In this context, Scott’s framework helps us identify a theoretical maximum allocation to alpha strategies with low or no correlation to the returns on the indexed portion of an investor’s portfolio. However, we must also adjust this downward based on our degree of confidence in both the manager’s ability to keep generating positive alpha, and our own ability to accurately identify skilled managers.

Perhaps that is why, as *Barron’s* recently noted, high net worth investors are increasingly attracted to ETFs and other index products (see “Why the Rich Like These Bare Bones Products” 19Oct09). Unfortunately, high end customers’ growing interest in a different approach to investing – a mix of index and uncorrelated alpha products, rather than traditional long-only active funds – is only slowly trickling down

through the ranks of advisers. For example, the *Financial Times* recently cited a new survey finding that “just under two thirds of [UK] independent financial advisers have never advised on ETFs, while 23 percent have recommended the products to less than ten percent of their clients” (“Advisers Fail Consumers on ETFs”, by Alice Ross, 4Dec09). Frankly, this strikes us as short-sighted, since in a low return environment investors should be more conscious about the level of fees they pay, and moving to greater use of index products would leave more room for IFAs to charge hourly fees. And on top of that, regulatory changes are putting more pressure on the traditional commission based model (e.g., in the UK and Australia). In addition, we expect that at some point, the high fees charged by active managers for relatively poor performance will get caught up in the growing populist anger toward Wall Street and the City of London. In sum, the world of asset management is changing, but in ways that still leave a lot of room for good advisers to add value for their clients and make well-earned profits at the same time.

Another Paper on Timberland Investing

In “Does Money Grow on Trees?” Scholtens and Spierdijk take on one of our favorite subjects: the potential diversification benefits provided by timberland investments. At first glance, their paper is negative – they conclude there are few benefits from investing in timberland. However, their analytical approach makes this conclusion quite suspect. To their credit, they highlight the lack of market based indices for this asset class, and the underestimate of volatility caused by the appraisal methodology used by the popular NCREIF Timberlands Index. Also to their credit, they include other proxies for timberland, including a mix of timber REITS, similar to the one we use in our analysis. However, the negative tone of their conclusions is offset by some other aspects of their analysis that they report. After using a statistical procedure to adjust for the smoothing of the NCREIF Index returns, the authors note that “the unsmoothed index significantly increases the mean/variance efficiency [of the portfolio] for portfolio volatilities up to 5.3%. In other words, using mean variance optimization assumptions

based on historical returns, and a single regime methodology, the authors still find that timberland deliver significant risk reduction benefits (at the end of the paper, they do note that “finally, our analysis is based on historical data, which do not necessarily have predictive power for future performance”).

Later, the authors find that their index of timber REITS leads to significant benefits when their analysis is based on the global minimum variance portfolio (GMV). This is significant, because the GMV avoids estimation errors related to future returns, and seeks only to minimize portfolio volatility (standard deviation), given assumptions about individual asset class volatilities and correlations. In our view, it is quite reassuring (and in line with our oft stated views) that including timber REITS has a positive impact on the GMV. This is nothing more or less than what you would expect, given that one of the key contributors to timberland returns – the physical growth of trees – is completely uncorrelated with return drivers on other asset classes.

However, based on our analysis, the authors’ conclusions on the potential portfolio value of timber REITs are too weak. The following analysis shows to ways of measuring the real return on a long position in timber REITS (based on a 70% allocation to Plum Creek Timber and a 30% allocation to Rayonier). The first is a traditional “long-only” allocation. The second takes the basic long position in the timber REITs, but eliminates the impact of the overall equity market on REIT returns by taking an offsetting short position in the overall U.S. equity market (Wilshire 5000 Index). The first table shows that the long/short approach (which is unfortunately not yet an investable product for retail investors) produces a much more attractive real return profile.

<i>2004-2008 Real Monthly USD Returns</i>	Average	Std. Dev.	Skew	Kurtosis
Long-Only Timber REIT	0.67%	5.88%	(1.51)	6.10
Long Timber REIT/Short Equity Mkt	0.96%	4.19%	0.60	1.23

The next table shows the correlation of both the long-only and long/short timber REIT returns with real monthly returns on other broad asset classes:

<i>Based on 2004-2008 Real Monthly USD Returns</i>	Real Return Bonds	Nominal Bonds (AGG)	Domestic Property	Commodities (DJUBS)	Gold	Equity	Volatility
Long-Only Timber REIT	0.25	0.08	0.66	0.16	0.20	0.70	-0.43
Long Timber REIT/Short Equity Market Index	0.11	0.00	0.19	-0.11	0.08	0.04	0.02

The last table shows how the long only and long/short approach to timber performed during three critical months: August through November, 2008:

<i>Real USD Monthly Returns in 2008</i>	Long Only	Long/Short
August	0.9%	-1.2%
September	2.7%	7.2%
October	-25.7%	-5.4%
November	-0.2%	6.3%

In sum, we continue to support the inclusion of publicly traded timber REITs in our equally weighted, and most of our other model portfolios. We would be even more enthusiastic if it were possible for retail investors to invest in a product that hedged away timber REITs exposure to the overall equity market.

Highlights from Recent Research Studies

This section will provide a short summary of some of the best recent research studies we have read. All of them are available either by search engine or on www.ssrn.com.

- In “Does Ambiguity [Uncertainty] Aversion Affect How Investors Respond to Analyst Forecasts?”, Antoniou, Read and Galariotis conclude that “in an impoverished information environment, when investors cannot separate accurate from inaccurate forecasts, they will become pessimistic, and treat downward forecasts as more reliable than they are, and upward forecasts as less reliable.” This is an important finding: as investors become more uncertain, they not only form stronger networks, but also become more pessimistic in their outlook, setting

the stage for sharp downward asset price moves, and potentially overshooting and undervaluation.

- In “Risk Sentiment Index (RSI) and Market Anomalies”, Kaplanski and Levy reach a similar conclusion. They use statistics to divide the returns on the VIX (and, to confirm their findings, a similar index in Japan) into two parts. “One component is the estimate of the risk based on existing economic and statistical data [e.g., a GARCH model of VIX returns], while the other component, the Risk Sentiment Index, is defined as the regression residuals that are unexplained by available economic and statistical data...Hence, the RSI comes as close as possible to being a pure risk sentiment index.” Another possible interpretation of this analysis is that it divides VIX returns into components that are due to changing risk perceptions and components that are due to changing subjective uncertainty. The authors find that equity returns and the RSI have a significant negative correlation.
- A new paper from the IMF is also closely related to the two works cited above. In “The Uncertainty Channel of Contagion”, Kannan and Kohler-Geib model “a new channel of contagion, where the degree of anticipation of a crisis, through its impact on investor uncertainty, determines the occurrence of contagion” across asset classes. The authors “empirically show how uncertainty has an independent effect beyond other contagion channels.”
- In “Leadership, Consensus Decision Making and Collective Behavior in Humans”, Dyer, Johansson, Helbing, Couzin and Krause review the existing literature and conduct experiments to show that “only a small minority of informed individuals [5% - 10% of the total] is needed to guide a large uninformed group” in a variety of different social contexts. Another paper, “Higher Order Beliefs Among Professional Stock Market Forecasters” puts the first paper’s findings in a financial market context. The authors (Rangvid, Schmeling, and Schrimpf) find that “when a portfolio manager’s pay is related to their outperformance relative to a market

benchmark, they have a clear incentive to look more towards the forecasts of other forecasters when forming their own forecast, regardless of whether the average forecast contains informative signals about the fundamental value of asset prices...We find strong evidence that the impact of consensus beliefs on individual beliefs is higher if a forecaster is a “relative forecaster”...In contrast, being in the group of “absolute forecasters” [whose pay depends upon absolute rather than relative returns] decreases the impact of consensus beliefs on the individual’s forecast.” They also find “clear evidence that younger and less experienced forecasters incorporate the consensus forecast into their own forecast to a significantly larger extent than older forecasters.”

- In past issues, we have noted the growing research on envy and gloating as drivers of human behavior, and their complex tradeoff against fear that a decision will produce loss and regret. In light of that, we read with interest a new paper by Clark and Senik, on “Who Compares to Whom? The Anatomy of Income Comparisons in Europe.” Using largescale survey data, the authors find that “income comparisons are found to be at least somewhat important by three quarters of Europeans...and are associated with both lower levels of subjective well-being and greater demand for income redistribution...With respect to direction of comparisons, colleagues are the most frequently cited reference group. Those who compare to colleagues are happier than those who compare to other benchmarks. Comparisons to friends are both less widespread and are associated with the lowest well-being scores...Last, there is some evidence that reference groups are endogenous, with individuals tending to compare to those with whom they interact most often.”
- In “Art and Money”, Goetzmann, Renneboog and Spaenjers “investigate the impact of equity markets and top incomes on art prices.” They find that “both same-year and lagged equity market returns have a significant impact on the price level in the art market.” They also find that “over a shorter period of time, an increase in

income inequality may also lead to higher prices for art...and that over a longer period of time there is a relationship between top incomes and art prices.” In sum, this paper confirms what we have noted in the past: while art is valuable for many reasons, portfolio diversification benefits aren’t one of them.

- We call our UK readers’ attention to a new paper, “The Fama-French and Momentum Portfolios and Factors in the UK” by Gregory, Tharyan and Huang. In the manner of Ken French in the US, they have created, and make freely available, a comparable set of small-big, value-growth, and momentum factors for the UK equity market. A key conclusion of their work is that these factors may not capture the risk inherent in the UK equity market to the same extent they do in the US.
- In the human interest department, we call your attention to two interesting papers. In “Red Brain, Blue Brain”, Schreiber, Simmons, Dawes et al “test a conjecture that ideological differences between partisans reflect distinctive neural processes.” They accomplished this by matching voter records to a sample of 54 subjects for whom extensive brain scanning data is available. The authors “find that Democrats and Republicans had significantly different brain activation during the processing of risky decisions. Amygdala activations, associated with externally directed reactions to risk, are stronger in Republicans, while insula activations, associated with internally directed reactions to affective perceptions, are stronger in Democrats...It appears in our experiment that Republican participants, when making a risky choice, are predominantly externally oriented, reacting to their fear related processes with a tangible potential external consequence. In comparison, risky decisions made by Democratic participants appear to be associated with monitoring how the selection of a risky response might feel internally.” The authors also find that “a two parameter model of partisanship based on amygdala and insula activations achieves better accuracy in predicting whether someone is a Democrat or Republican than a well-established model in political science based on parental socialization of party identification.” A similar study is “Red-Blooded

Republican or True-Blue Democrat? The Influence of Political Preferences on Money Managers' Portfolio Decisions" by Chin and Parwada. Using net campaign contributions by money managers as a proxy for their political preference, the authors conclude that during the 2000 U.S. Presidential Election cycle, money managers placed larger bets on stocks that were expected to perform best if their favored candidate had won. Needless to say, in combination these papers provide interesting food for thought about the linkages between differences in neurobiology, different approaches to decision making in the face of uncertainty and risk, and differences in active managers' portfolio holdings and results.

- More news on the CEO front. Last month, we presented a summary of recent research on the contributions of managerial skill and luck to corporate performance. To paraphrase the results, lack of management skill clearly hurts performance, while superior skill seems to have much less of an impact than luck on outstanding corporate performance. It was with this in mind that we read two new papers. The first ("The Wages of Failure" by Bebchuk, Cohen and Spamann) looked at the compensation earned by the top five executives at Bear Stearns and Lehman Brothers between 2000 and 2008. The conclusion was disheartening, but in line with what most of our readers would guess. "Overall, we estimate that the top executive teams of Bear Stearns and Lehman Brothers derived cash flows of about \$1.4 billion and \$1 billion respectively from cash bonuses and equity sales during 2000-2008. These cash flows substantially exceeded the value of the executives' initial holdings at the beginning of the period, and the executives' payoffs for the period were thus decidedly positive. The divergence between how the top executives and their shareholders fared implies that it is not possible to rule out, as standard narratives suggest, that the executives' pay arrangements provided them with excessive risk taking incentives." This is a damning paper that we believe will eventually become widely cited. The second paper, was "Scapegoating and Firm Reputation" by Cristian Dezso of the University of Maryland. He begins by noting that "firms typically fire senior executives in

response to performance failures. Often, however, the expected performance improvements fail to materialize, suggesting that some of the fired executives are scapegoats.” Dezso proposes that “firms [boards] differ in their ability to identify incompetent executives that cause failure, and the market [active investors and analysts] imperfectly observes this ability.” He concludes that “scapegoating, defined as random firing by a low ability firm, is an optimal, reputation-saving, value-maximizing strategy if firms care sufficiently about short-term value, if that value depends on reputation, and if current reputation is sufficiently high to be worth sacrificing a competent executive for...Even firms that are perfectly able to distinguish between exogenous and executive caused failure will scapegoat to leverage their reputation if the market is sufficiently convinced that failure is caused by incompetence.” Of course, it is easy to see the kind of destructive dynamic this sets up – if a CEO believes he or she will eventually become a scapegoat, the leap to aggressively pushing for high compensation to offset this risk isn’t a hard one to make – which brings us right back to the importance of active managers and corporate boards both understanding the true drivers of poor and great performance. Unfortunately, it seems like we’re still a long way away from that being the case.

A Year-End Overview of Major Asset Class Valuation Drivers and Best Regimes

Asset Class	Fundamental Value Drivers	Best Regime for Relative Outperformance
<i>Real Return (Inflation Indexed) Bonds</i>	<ul style="list-style-type: none"> • Average real economic growth rate (higher average growth = higher real rate = lower real return bond prices) • Volatility of real economic growth (higher volatility = lower real rate = higher real return bond prices) • Investor risk aversion (higher risk aversion = lower real rate = higher real return bond prices) • Investor uncertainty and time discount rate (higher uncertainty = lower time discount rate = lower real rate = higher real return bond prices) 	<ul style="list-style-type: none"> • High Inflation
<i>Nominal Return Government Bonds (assumed to have no credit/default risk)</i>	<ul style="list-style-type: none"> • Real Return Bond Yield (higher = higher rate on nominal government bonds = lower bond prices) • Expected inflation (higher = higher rate on bonds = lower bond prices) • Volatility of inflation rate over past three years (higher volatility = higher rate on bonds = lower bond prices) 	<ul style="list-style-type: none"> • High Uncertainty, especially for shorter maturities
<i>Private Sector Nominal Return Credit Bonds</i>	<ul style="list-style-type: none"> • Nominal Government Bond Yield • Expected Real Economic Growth and Volatility of Real 	<ul style="list-style-type: none"> • Normal Times

Asset Class	Fundamental Value Drivers	Best Regime for Relative Outperformance
	Economic Growth – both drive expected default rate (higher expected default rate = higher bond yield = lower bond price)	
Commercial Property Securities (e.g., REITs)	<ul style="list-style-type: none"> • Net Operating Income or Dividend Yield (NOI or Div divided by market value of property) • Expected real growth in NOI or Dividends (long term average is .2%, due to few limits on capacity/supply growth; however, over shorter periods, when demand/supply can become significant, growth rate can be higher) • Market value of property also driven by the yield on real return bonds (higher rates = lower property market value)... • ...And by the risk premium investors require to hold this asset class. Over the long term, we assume this is 3%; however, it will vary in the short term, falling when asset prices are rising, and rising when uncertainty increases and prices are falling 	<ul style="list-style-type: none"> • High Inflation
Long-Only Commodity Futures Based Index Funds	<ul style="list-style-type: none"> • Yield on Real Return Bonds (collateral yield) • Diversification Return (highest when index contains a mix of commodities whose returns have low correlations with each other; when prices are quickly rising, as in 2007, correlations also tend to rise, 	<ul style="list-style-type: none"> • High Inflation and the later stages of Normal Times

Asset Class	Fundamental Value Drivers	Best Regime for Relative Outperformance
	<p>reducing diversification return)</p> <ul style="list-style-type: none"> • Roll return (negative when futures prices are higher than spot prices) • Unexpected changes in spot prices (due to supply side shocks and/or unexpected changes in future demand forecasts) • The yield on real return bonds (higher = lower asset price) • The risk premium investors require to hold this asset class. Over the long term, we assume this is 3% due to commodities' historically low correlation with returns on most other asset classes. In the short term, however, it varies, falling when asset prices are rising, and rising when uncertainty increases and prices are falling 	
<i>Timber</i>	<ul style="list-style-type: none"> • Net Operating Income or Dividend Yield (NOI or Div divided by market value of property) • Growth of NOI or Dividends driven by: <ul style="list-style-type: none"> • Biological growth rate of trees • Harvesting rate • Change in real forest product prices • Change in value (if any) of carbon sequestration credits • Market value of timber also driven by yield on real return bonds (higher rates = lower 	<ul style="list-style-type: none"> • High Inflation

Asset Class	Fundamental Value Drivers	Best Regime for Relative Outperformance
	<p>market value of timberland)</p> <ul style="list-style-type: none"> The risk premium investors require to hold this asset class. Over the long term, we assume this is 3% due to timber's historically low correlation with returns on most other asset classes. In the short term, however, it varies, falling when asset prices are rising, and rising when uncertainty increases and prices are falling 	
<i>Gold</i>	<ul style="list-style-type: none"> Fundamental valuation of gold remains an unresolved question Higher expected inflation, higher uncertainty, and lower USD exchange rate all associated with higher gold prices 	<ul style="list-style-type: none"> High Inflation and High Uncertainty
<i>Direct Oil and Gas Investments</i>	<ul style="list-style-type: none"> Finding and development cost for new reserves (lower = cheaper reserve growth = higher asset price) Production rate (higher = higher cash flow = higher asset price) Reserve depletion rates (higher = shorter reserve life = lower asset price) Changes in real oil and gas prices (higher = higher asset price) Yield on real return bonds (higher rates = lower asset price) The risk premium investors require to hold this asset class. Over the long term, we assume this is 3% due to oil 	<ul style="list-style-type: none"> Normal Times and High Inflation

Asset Class	Fundamental Value Drivers	Best Regime for Relative Outperformance
	and gas properties' historically low correlation with returns on most other asset classes. In the short term, however, it varies, falling when oil and gas prices are rising, and rising when uncertainty increases and oil and gas prices are falling	
<i>Developed Country Equities</i>	<ul style="list-style-type: none"> • Current dividend yield (higher = higher asset price) • Expected real growth rate of dividends. Over long periods, this is equal to the rate of total factor productivity growth (higher = higher asset price) • Current real return bond yield (lower = higher asset price) • The risk premium investors require to hold this asset class. Over the long term, we assume this is 2.5% to 4.0%. In the short term, however, it varies, falling when equity prices are rising, and rising when uncertainty increases and equity prices are falling 	<ul style="list-style-type: none"> • Normal Times
<i>Emerging Market Equities</i>	<ul style="list-style-type: none"> • Drivers are the same as developed market equities • However, expected rate of productivity growth and risk premium are both higher 	<ul style="list-style-type: none"> • Normal Times
<i>Equity Volatility</i>	<ul style="list-style-type: none"> • Volatility in real macroeconomic growth • Volatility in inflation level • Level of investor uncertainty • Amount of leverage employed in the economy and especially by financial 	<ul style="list-style-type: none"> • High Uncertainty

Asset Class	Fundamental Value Drivers	Best Regime for Relative Outperformance
	institutions	
<i>Foreign Currency/Exchange Rate changes affecting foreign bonds, property and equity</i>	<ul style="list-style-type: none"> • Over the long-term, exchange rate changes should offset differences in nominal government bond yields • Over shorter periods, many other factors drive changes in exchange rates, including policy actions by governments, liquidity needs of corporations, and cross border investment and borrowing flows 	<ul style="list-style-type: none"> • Varies by currency. Historically, USD and CHF have performed well in periods of High Uncertainty.

Model Portfolios Update

Our model portfolios are constructed using a simulation optimization methodology. They assume that an investor understands the long-term compound real rate of return he or she needs to earn on his or her portfolio to achieve his or her long-term financial goals. We use SO to develop multi-period asset allocation solutions that are “robust”. They are intended to maximize the probability of achieving an investor’s compound annual return target under a wide range of possible future asset class return scenarios. More information about the SO methodology is available on our website. Using this approach, we produce model portfolios for six different compound annual real return targets: 7%, 6%, 5%, 4%, 3%, and 2%. We produce two sets of these portfolios: one assumes only investments in broad asset class index funds. These are our “all beta” portfolios. The second set of model portfolios includes uncorrelated alpha strategy funds as a possible investment. These assume that an investor is primarily investing in index funds, but is willing to allocate up to ten percent of his or her portfolio to equity market neutral investments.

We use two benchmarks to measure the performance of our model portfolios. The first is cash, which we define as the yield on a one year government security purchased on the last trading day of the previous year. For 2009, our USD cash benchmark is 0.37% (in nominal terms). The second benchmark we use is a portfolio equally allocated between the ten asset classes we use (it does not include uncorrelated alpha). This portfolio assumes that an investor believes it is not possible to forecast the risk or return of any asset class. While we disagree with that assumption, it is an intellectually honest benchmark for our model portfolios’ results.

The year-to-date nominal returns for all these model portfolios can be found at: <http://www.indexinvestor.com/Members/YTDReturns/USA.php>

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.

	Cooperative Scenario	Conflict Scenario
<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 and lower consumption, without triggering populist demands for protectionism.	Continued economic stagnation, uncertainty, and insecurity lead to more extreme partisanship and the development of strong populist calls for protectionism and income redistribution.
Chinese Peasants	Land reform and economic growth (which provides jobs) boost 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-	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

	Cooperative Scenario	Conflict Scenario
	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.	conditions via closer ties with China, while maintaining its nuclear program (which could trigger an attack by Israel) and a conflict-oriented policy versus the US that continues to put upward pressure on energy prices.
Key Issue Level Scenario Assumptions:		
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	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

	Cooperative Scenario	Conflict Scenario
	manageable level.	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>
November 2009 (this month's issue)	<ul style="list-style-type: none"> • Israeli press leaks indicate that patience with Iran's stalling tactics in the nuclear talks is at or close to the point of exhaustion, raising the probability of military action. • 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 	<ul style="list-style-type: none"> • US EPA announces finding that greenhouse gases endanger human health, setting the stage for more aggressive regulations that could also stimulate higher business investment. • Obama administration begins campaign for second stimulus program aimed at reducing high levels of unemployment in USA that are constraining consumption spending

	Cooperative Scenario	Conflict Scenario
	<ul style="list-style-type: none"> • Despite this, banks still seem intent on paying extremely high, and politically incendiary bonuses at year end 	
October 2009	<ul style="list-style-type: none"> • Rising trade tensions between US and China • Increasing calls by US commentators for an increase in the China/US exchange rate • Publication of major new report criticizing growing overcapacity in China and its negative impact on the world economy • With 28% of mortgaged houses in negative equity, Obama administration admits mortgage restructuring program isn't working; press discussion of morality of mortgage default • Growing recognition of probable extent of municipal bond crisis • Iran continues to delay discussions over its nuclear capability; Israel's patience reportedly running out • Widening gap between financial market performance (and record bonuses on Wall Street) and conditions in real economy raises 	<ul style="list-style-type: none"> •

	Cooperative Scenario	Conflict Scenario
	probability of substantial price declines in some asset classes (e.g., equities), and further ratcheting up of pressures on the banking and financial system	
September 2009	<ul style="list-style-type: none"> • LA Times (20Sep09) reports new Experian OliverWyman study that finds “the number of strategic mortgage defaults in 2008 was far beyond most industry estimates.” A significant portion are by people with high education and incomes, who “see default as a business decision.” • IMF’s Global Financial Stability Review forecasts another \$1.5 trillion in bank chargeoffs. It also concludes that earnings will be insufficient to absorb them, and that capital ratios will once again come under pressure. • London <i>Telegraph</i> reports draft Chinese report proposes export ban on rare earth minerals that are critical to many western industries, including hybrid vehicles and windmills. • Obama Administration imposes duties on 	<ul style="list-style-type: none"> • G20 meeting in Pittsburgh agrees on need to address global imbalances. • Reports that Chinese agricultural land reforms are beginning to result in higher capital flows to peasant population (see James Kynge, “Seeds of Change in Rural China”, FT 7Oct98) •

	Cooperative Scenario	Conflict Scenario
	<p>Chinese tire imports. China plans retaliation.</p> <ul style="list-style-type: none"> • Reports that many Chinese companies, in an echo of 1980s Japan, are reaping large profits from land speculation (see Andy Xie's column in the 16 Sep 09 issue of Caijing, "What We Can Learn as Japan's Economy Sinks) • New Japanese Prime Minister Yukio Hatoyama proposes new Asian Economic Bloc, modeled on European Union • Iran acknowledges second uranium upgrading location; Israel reported to have evidence of substantial Russian involvement in Iranian nuclear program; Reports of Russian plans to thwart any blockade of gasoline imports into Iran imposed by Western nations; President Ahmadinejad delivers strong anti-Israel speech at U.N.; first death sentences imposed on people arrested in Iran during summer's post election protests. 	
August 2009	<ul style="list-style-type: none"> • IMF recognition that two key transitions needed to escape prolonged slow growth – shift from government to private 	<ul style="list-style-type: none"> • H1N1 influenza epidemic is spreading in Northern Hemisphere as forecast; however, fatality rate thus far is

	Cooperative Scenario	Conflict Scenario
	<p>sector spending in U.S., and to a lower Chinese current account surplus – will both be difficult to achieve.</p> <ul style="list-style-type: none"> • Unemployment continues to worsen in the U.S., with continuing evidence of credit quality deterioration in multiple sectors, including residential and consumer mortgages, credit cards, municipal securities, and small and medium sized banks • 31% of workers report being worried about layoff; double the number of a year ago. Meanwhile, broadly measured U.S. unemployment is at 16.7%. • Minimal progress towards passage of healthcare reform legislation, and new financial services industry regulation • Growing resentment of booming profits and bonus accruals at Wall Street firms that benefit from de facto government guarantees of their liabilities. • Chinese spying allegations against Rio Tinto, and U.S. imposition of anti- 	<p>lower than rates implied by some earlier Southern Hemisphere experiences (e.g., in Argentina), and vaccinations will start in October.</p>

	Cooperative Scenario	Conflict Scenario
	<p>dumping duties on Chinese tire export</p> <ul style="list-style-type: none"> • Falling profits reported in many Chinese industrial sectors, despite GDP growth fueled by aggressive bank lending. Bubble conditions in Chinese equity and possibly property markets. • In Iran, Ahmadinejad consolidates his position, and, with Russian's help, apparently forces Western nations to back down on demand for nuclear talks or imposition of sanctions. Israel may decide it has no choice but to attack Iran, as it did Iraq's Osirak reactor in 1981 	