

The Index Investor

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December 2010 Issue: Key Points

In this month's issue, we take an in-depth look at the challenges facing the world economy, and present our conclusions about how they will combine to produce possible future scenarios that are considerably more negative than the prevailing conventional wisdom at the end of 2010. To briefly state our conclusion, we believe that political institutions and elites in China, the Eurozone, the United States, and at the multilateral level lack the willingness and/or ability to successfully resolve the deleveraging, demand, and deflation issues confronting the world economy. As a result, these issues will likely combine to produce more negative outcomes than the conventional wisdom currently expects. Most dangerously, those outcomes will likely feed back on the political institutions and elites themselves, and accelerate the current erosion of their legitimacy, with very unpredictable consequences. At the end of the article, we review the implications of our conclusions for future asset class returns.

Global Asset Class Returns

YTD30Nov10	In USD	In AUD	In CAD	In EUR	In JPY	In GBP	In CHF	In INR
Asset Held								
USD Bonds	8.31%	1.68%	6.23%	17.58%	-2.82%	11.87%	4.58%	6.89%
USD Prop.	22.62%	15.99%	20.54%	31.89%	11.50%	26.18%	18.90%	21.20%
USD Equity	9.63%	3.00%	7.55%	18.90%	-1.49%	13.19%	5.91%	8.21%
AUD Bonds	9.61%	2.98%	7.53%	18.88%	-1.52%	13.17%	5.88%	8.19%
AUD Prop.	6.13%	-0.50%	4.05%	15.40%	-5.00%	9.69%	2.40%	4.71%
AUD Equity	4.22%	-2.40%	2.15%	13.49%	-6.90%	7.79%	0.50%	2.81%
CAD Bonds	8.01%	1.39%	5.94%	17.28%	-3.11%	11.57%	4.29%	6.59%
CAD Prop.	22.71%	16.08%	20.64%	31.98%	11.59%	26.27%	18.99%	21.29%
CAD Equity	14.94%	8.32%	12.87%	24.21%	3.82%	18.50%	11.22%	13.52%
CHF Bonds	7.93%	1.31%	5.86%	17.20%	-3.19%	11.49%	4.21%	6.51%
CHF Prop.	22.63%	16.00%	20.55%	31.90%	11.50%	26.19%	18.90%	21.21%
CHF Equity	2.02%	-4.61%	-0.05%	11.29%	-9.10%	5.58%	-1.70%	0.60%
INR Bonds	-1.56%	-8.19%	-3.64%	7.71%	-12.69%	2.00%	-5.28%	-2.98%
INR Equity	12.79%	6.16%	10.72%	22.06%	1.67%	16.35%	9.07%	11.37%
EUR Bonds	-2.03%	-8.66%	-4.11%	7.24%	-13.16%	1.53%	-5.75%	-3.45%
EUR Prop.	3.45%	-3.18%	1.37%	12.72%	-7.68%	7.01%	-0.27%	2.03%
EUR Equity	-12.84%	-19.46%	-14.91%	-3.57%	-23.96%	-9.28%	-16.56%	-14.26%
JPY Bonds	12.02%	5.39%	9.94%	21.29%	0.89%	15.58%	8.30%	10.60%
JPY Prop.	34.87%	28.24%	32.79%	44.14%	23.74%	38.43%	31.15%	33.45%
JPY Equity	5.44%	-1.19%	3.37%	14.71%	-5.68%	9.00%	1.72%	4.02%
GBP Bonds	4.30%	-2.32%	2.23%	13.57%	-6.82%	7.86%	0.58%	2.88%
GBP Prop.	-6.49%	-13.12%	-8.57%	2.78%	-17.62%	-2.93%	-10.21%	-7.91%
GBP Equity	3.20%	-3.43%	1.12%	12.47%	-7.93%	6.76%	-0.52%	1.78%
1-3 Yr USGvt	2.44%	-4.19%	0.36%	11.71%	-8.69%	6.00%	-1.28%	1.02%
World Bonds	2.75%	-3.87%	0.68%	12.02%	-8.37%	6.32%	-0.97%	1.34%
World Prop.	16.06%	9.44%	13.99%	25.33%	4.94%	19.62%	12.34%	14.64%
World Equity	5.04%	-1.59%	2.96%	14.31%	-6.09%	8.60%	1.31%	3.62%
Commod Long Futures	4.76%	-1.87%	2.68%	14.03%	-6.37%	8.32%	1.03%	3.34%
Commod L/Shrt	-15.68%	-22.30%	-17.75%	-6.41%	-26.80%	-12.12%	-19.40%	-17.10%
Gold	26.20%	19.57%	24.12%	35.46%	15.07%	29.76%	22.47%	24.78%
Timber	7.26%	0.63%	5.18%	16.52%	-3.87%	10.82%	3.53%	5.84%
Uncorrel Alpha	2.67%	-3.96%	0.59%	11.94%	-8.45%	6.23%	-1.05%	1.25%
Volatility VIX	20.90%	14.28%	18.83%	30.17%	9.78%	24.46%	17.18%	19.48%
Currency								
AUD	6.63%	0.00%	4.55%	15.90%	-4.50%	10.19%	2.90%	5.21%

<i>YTD30Nov10</i>	<u>In USD</u>	<u>In AUD</u>	<u>In CAD</u>	<u>In EUR</u>	<u>In JPY</u>	<u>In GBP</u>	<u>In CHF</u>	<u>In INR</u>
CAD	2.08%	-4.55%	0.00%	11.35%	-9.05%	5.64%	-1.65%	0.66%
EUR	-9.27%	-15.90%	-11.35%	0.00%	-20.39%	-5.71%	-12.99%	-10.69%
JPY	11.12%	4.50%	9.05%	20.39%	0.00%	14.69%	7.40%	9.71%
GBP	-3.56%	-10.19%	-5.64%	5.71%	-14.69%	0.00%	-7.28%	-4.98%
USD	0.00%	-6.63%	-2.08%	9.27%	-11.12%	3.56%	-3.72%	-1.42%
CHF	3.72%	-2.90%	1.65%	12.99%	-7.40%	7.28%	0.00%	2.30%
INR	1.42%	-5.21%	-0.66%	10.69%	-9.71%	4.98%	-2.30%	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):

<i>YTD 30Nov10</i>	<u>In USD</u>	<u>In AUD</u>	<u>In CAD</u>	<u>In EUR</u>	<u>In JPY</u>	<u>In GBP</u>	<u>In CHF</u>	<u>In INR</u>
<i>Eq Mkt Neutral</i>								
HSKAX	-3.97%	-10.59%	-6.04%	5.30%	-15.09%	-0.41%	-7.69%	-5.39%
OGNAX	-3.09%	-9.71%	-5.16%	6.18%	-14.21%	0.47%	-6.81%	-4.51%
<i>Arbitrage</i>								
ARBFX	1.58%	-5.05%	-0.50%	10.85%	-9.55%	5.14%	-2.15%	0.16%

YTD 30Nov10	In USD	In AUD	In CAD	In EUR	In JPY	In GBP	In CHF	In INR
ADANX	4.17%	-2.45%	2.10%	13.44%	-6.95%	7.73%	0.45%	2.76%
Currency								
DBV	-2.08%	-8.71%	-4.16%	7.19%	-13.21%	1.48%	-5.80%	-3.50%
ICI	2.00%	-4.63%	-0.08%	11.27%	-9.13%	5.56%	-1.73%	0.58%
Equity L/S								
HSGFX	1.80%	-4.83%	-0.28%	11.07%	-9.32%	5.36%	-1.92%	0.38%
PTFAX	9.91%	3.28%	7.83%	19.18%	-1.21%	13.47%	6.19%	8.49%
GTA								
MDLOX	4.89%	-1.74%	2.82%	14.16%	-6.23%	8.45%	1.17%	3.47%
PASAX	11.49%	4.86%	9.41%	20.76%	0.36%	15.05%	7.77%	10.07%

Overview of Our Valuation Methodology

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

We emphasize that while forecasting the future behavior of a complex adaptive system (with a degree of accuracy beyond simple luck) is extremely challenging, it is not impossible. There are two reasons for this. First, complex adaptive systems are constantly evolving, and pass through phases when their behavior makes forecasting more and less challenging. In the investment context, we believe the best example of

this is extreme overvaluations, which throughout history have confirmed that what can't continue doesn't continue. Second, it is also the case that, across a range of contexts, researchers have found that a small percentage of people and teams are able to develop superior mental models that provide them with a superior, if "coarse-grained" understanding of the dynamics of complex adaptive systems. More important there is also significant evidence that superior mental models translate into substantial performance advantages (see, for example, "Mental Models, Decision Rules, Strategy and Performance Heterogeneity" by Gary and Wood, "Team Mental Models and Team Performance" by Lim and Klein, and "Good Sensemaking is More Important than Information" by Eva Jensen).

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

We also believe that, in addition to careful asset allocation, a disciplined portfolio risk management process is critical to an investor achieving his or her long-

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

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

In each month’s issue of our journals, we provide investors with updated valuation estimates for a wide range of asset classes. The basic assumptions that underlie our valuation methodology are as follows: (1) In the medium term, asset prices are attracted to their fundamental values. (2) However, fundamental valuation can only be estimated with a degree of uncertainty. (3) In the short term, asset prices

are most strongly influenced by what Keynes called the market's "animal spirits", which we interpret as collective investor behavior resulting from the complex interplay between underlying political and economic trends and events, information flows, individual mental models, emotions, and social network interactions. (4) Valuation methodologies are most useful to investors when they are applied on a consistent basis over time.

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

Table: Market Implied Regime Expectations and Three Year Return Forecast

We use the following table to provide insight into the weight of market views about which of three regimes – high uncertainty, high inflation, or normal growth – is developing. The table shows rolling three month returns for different asset classes. The asset classes we list under each regime should deliver relatively high returns when that regime develops. We assume that both the cross-sectional and time series comparisons we present provide insight into the market's conventional wisdom – at a

specific point in time -- about the regime that is most likely to develop within the next twelve months. To obtain the cross-sectional perspective, we horizontally compare the row labeled "This Month's Average" for the three regimes. In our interpretation, the regime with the highest rolling three month average is the one which (on the specified date) the market's conventional wisdom sees as the most likely to develop.

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

Rolling Three Month Returns in USD			30Nov10
High Uncertainty	High Inflation	Normal Growth	
Short Maturity US Govt Bonds (SHY) 0.13%	US Real Return Bonds (TIP) 1.53%	US Equity (VTI) 14.42%	
1 - 3 Year International Treasury Bonds (ISHG) 1.64%	Long Commodities (DJP) 12.47%	EAFE Equity (EFA) 8.65%	
Equity Volatility (VIX) -9.64%	Global Commercial Property (RWO) 9.17%	Emerging Equity (EEM) 11.78%	
Gold (GLD) 10.93%	Long Maturity Nominal Treasury Bonds (TLT)* -8.40%	High Yield Bonds (HYG) 4.19%	
Average 0.77%	Average (with TLT short) 7.89%	Average 9.76%	
Three Months Ago: -2.37%	Three Months Ago: 0.26%	Three Months Ago: 2.44%	

* Falling returns on TLT indicate rising inflation expectations

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

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

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

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

Regime	Normal Regime	High Uncertainty Regime	High Inflation Regime	<i>Forecast Annual USD Real Return Over Next Three Years (weighted real return plus premium)</i>
Domestic Equity	3.5	-12.0	-5.0	(4.4)
Foreign Equity	3.5	-12.0	-7.0	(5.0)
Emerging Equity	4.5	-15.0	1.0	(3.9)
Gold	-2.0	2.0	2.5	3.8
Volatility	-25.0	50.0	25.0	29.9

Table: Fundamental Asset Class Valuation and Recent Return Momentum

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

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

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

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

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

An exception to this approach is our assessment of the future return to local investors for holding U.S. dollars. In this case, our conclusions are mechanically driven by interest rate differentials on ten-year government bonds. To be sure, the theory of Uncovered Interest Rate Parity, which calls for exchange rates offsetting interest rate differentials is more likely to apply in the long-run than in the short run, as the apparent profitability of the carry trade has shown (i.e., borrowing in low interest rate currencies to invest in high interest rate currencies). However, other research have found that a substantial portion of these profits represents compensation for bearing so-called

“crash” risk (see “Crash Risk in Currency Markets” by Farhi, Fraiberger, Gabaix, et al) – as many who were long Icelandic Krona in 2007 and 2008 learned the hard way. In sum, exchange rates that are moving at an accelerating rate away from the direction they should move under interest rate parity indicates a rising risk of sudden reversal (i.e., crash risk).

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

<i>Valuation at 30Nov10</i>	<i>Current Price versus Long-Term Fundamental Valuation Estimate</i>	<i>Rolling 3 Month Return in Local Currency</i>	<i>Rolling 3 Month Return 3 Months Ago</i>
AUD Real Bonds	Neutral	-0.23%	4.10%
AUD Bonds	Neutral	-6.00%	6.08%
AUD Property	Neutral	-2.78%	4.22%
AUD Equity	Neutral	5.10%	0.39%

<i>Valuation at 30Nov10</i>	<i>Current Price versus Long-Term Fundamental Valuation Estimate</i>	<i>Rolling 3 Month Return in Local Currency</i>	<i>Rolling 3 Month Return 3 Months Ago</i>
CAD Real Bonds	Neutral	3.93%	3.34%
CAD Bonds	Possibly Overvalued	-0.07%	3.64%
CAD Property	Possibly Undervalued	2.68%	13.48%
CAD Equity	Possibly Overvalued	9.30%	2.39%
CHF Bonds	Likely Overvalued	-4.44%	4.23%
CHF Property	Likely Overvalued	2.20%	9.14%
CHF Equity	Possibly Overvalued	3.53%	-3.59%
EUR Real Bonds	Neutral	-3.99%	2.05%
EUR Bonds	Possibly Overvalued	-5.41%	5.52%
EUR Prop.	Neutral	6.46%	8.63%
EUR Equity	Neutral	3.75%	-1.24%
GBP Real Bonds	Possibly Overvalued	-1.05%	4.57%
GBP Bonds	Possibly Overvalued	-1.83%	5.78%
GBP Property	Possibly Undervalued	-4.90%	11.26%
GBP Equity	Possibly Undervalued	8.07%	-0.08%
INR Bonds	Possibly Overvalued	-1.09%	-1.48%
INR Equity	Probably Overvalued	7.84%	9.67%
JPY Real Bonds	Neutral	0.86%	3.06%
JPY Bonds	Possibly Overvalued	-2.15%	2.91%
JPY Property	Likely Undervalued	16.39%	1.00%
JPY Equity	Probably Overvalued	10.39%	-10.42%

<i>Valuation at 30Nov10</i>	<i>Current Price versus Long-Term Fundamental Valuation Estimate</i>	<i>Rolling 3 Month Return in Local Currency</i>	<i>Rolling 3 Month Return 3 Months Ago</i>
USD Real Bonds	Neutral	1.53%	3.28%
USD Bonds	Possibly Overvalued	0.09%	4.26%
USD Property	Neutral	7.15%	2.69%
USD Equity	Likely Overvalued	14.44%	-3.85%
<i>Following in USD:</i>			
Investment Grade Credit (CIU)	Possibly Overvalued	0.12%	4.63%
High Yield Credit (HYG)	Probably Overvalued	3.99%	5.05%
Emerging Mkt Equity (EEM)	Likely Overvalued	11.37%	6.75%
Commodities Long	Likely Overvalued	12.47%	4.26%
Gold	Likely Overvalued	10.93%	2.69%
Timber	Likely Undervalued	6.61%	1.86%
Uncorrelated Alpha	N/A	1.58%	0.93%
Volatility (VIX)	Likely Undervalued	-9.64%	-18.77%
<i>Future Return in Local Currency from holding USD: Based on Covered Interest Parity</i>			
Returns to AUD Investor	Positive	-7.58%	-5.35%
Returns to CAD Investor	Neutral	-3.70%	1.59%
Returns to EUR Investor	Neutral	-1.93%	-2.67%
Returns to JPY Investor	Negative	-0.29%	-8.80%
Returns to GBP Investor	Neutral	-1.21%	-4.72%
Returns to CHF Investor	Negative	-1.80%	-11.29%
Returns to INR Investor	Positive	-2.46%	1.44%

Investor Herding Risk Analysis

One of our core assumptions is that financial markets function as complex adaptive systems. One of the key features of such systems is their ability to pass through so-called “phase transitions” that materially change their character once certain variables exceed or fall below critical thresholds. In our September 2009 issue,

we reviewed a paper on one of critical variables, “Leverage Causes Fat Tails and Clustered Volatility” by Thurner, Farmer and Geanakoplos. This paper more formally demonstrated the importance of a factor that has been associated with booms and busts throughout financial history: the expansion of the supply of credit at a pace well in excess of real economic growth. In the past we have also noted that rising uncertainty tends to increase the size, degree of connectedness and intensity of communications within social networks that influence investor decision making. In turn, this leads to greater coordination of investor behavior, causing not only a higher tendency toward momentum, but also higher fragility, and susceptibility to rapid changes in asset prices (see, for example, “Asset Pricing in Large Information Networks” by Ozsoylev and Walden, or “Dragon Kings, Black Swans, and the Prediction of Crises” by Didier Sornette).

As a practical matter, the challenge for investors has been to identify variables or statistics that can be used to track the strengthening of networks that is often associated with phase transitions. With this in mind, we call readers’ attention to an excellent paper by Lisa Borland, of the asset management firm Evnine and Associates in San Francisco (“Statistical Signatures in Times of Panic: Markets as a Self Organizing System”). Using the phase transition approach, Borland searched for statistical signatures of market panics, and proposes a new order parameter that is easy to calculate and appears to capture the changing dynamics of asset return correlations and the underlying social network and herding phenomena that give rise to them. The parameter equals the number of financial markets or assets that have positive returns over a given interval (in 2010 we switched from YTD to just the past month, as we believe it provides a more accurate assessment), less the number that have negative returns, divided by the total number of financial markets or asset classes evaluated. If the value is zero, the markets are in a disordered state and far from the potential phase change point. However, as the parameter value approaches positive one or negative one, the markets are in an increasingly ordered state – that is, networks are larger and more active, causing increased alignment in collective investor behavior (more commonly known as “herding”). Under these conditions, a

market may be close to a phase change point, and therefore subject to a sudden, and potentially violent, shift in its previous trend. We have calculated this order parameter for the 38 financial markets (excluding foreign exchange) we evaluate each month. Here are the results for each of the most recent 12 months:

Dec09	Jan10	Feb10	Mar10	Apr10	May10	Jun10	Jul10	Aug10	Sep10	Oct10	Nov10
0.24	(0.03)	0.30	0.46	0.44	(0.28)	0.28	0.35	0.24	0.51	0.41	(0.57)

Given these data, we conclude that at **30 Nov 10**, there was a moderate but rising risk of a sudden, substantial, and highly correlated change in prices across multiple asset classes.

This Month's Letters to the Editor

Last month's article on active versus passive management was very interesting. However, what would you do if you were the CEO of a mutual fund company that specialized in actively managed funds?

Now that's a challenging question! Here are some ideas. First, focus traditional long-only funds on achieving a high active share (see last month's article), as research indicates that this is associated with skilled active management. Put differently, I'd get out of the closet indexing business that seems to destroy value for investors because of its higher cost than a "true" index product. Second, I would build up our range of uncorrelated alpha offerings for retail investors (at cost points well below the "2 and 20" traditionally charged by hedge funds), based on our conclusion that they can bring significant benefits to a portfolio, particularly as an investor's compound real return target increases. Third, I would place more emphasis on benchmarking performance at the portfolio rather than asset class level, and against a compound real return target rather than traditional external asset class benchmarks. Fourth, I would introduce an actively managed tail risk hedging product that could be easily purchased by retail investors. Fifth, I would probably experiment with an actively managed asset allocation product that was based on factor risk exposures (with asset class

investments as a means of accessing them) rather than direct investments in asset classes themselves. While we have written in the past about the challenges of risk factor based asset allocation, it is still an area that merits further investigation and experimentation.

George Feiger has written some very interesting articles noting that most academic finance research is worthless to practitioners. What do you think of his views?

We know George, and can vouch that he is very, very smart and not shy about expressing his views (which tend to be spot on target). Regarding the question you asked, we agree with his conclusion, which (in his most recent article), was based on his analysis of a number of prize-winning articles from leading academic journals. More broadly, George's conclusions fit with a broader critique of the economics professions (and indeed, many other academic disciplines), where the dominant faction of academics has increasingly awarded prizes to articles that are mathematically elegant and build on existing mainstream views, rather than articles which challenge those views and/or are highly valued by practitioners (at least the dwindling number who still read academic research journals). All that said, we do not believe that all academic research is worthless; in fact, over the past 15 years we have found (and reported to our readers) a lot of real gems, though almost all of these papers have been produced by "non-mainstream" academics. So, while agreeing with George, we will continue to search for, and report on, exceptions to the "Feiger Rule".

Five Year Economic Forecast and Implications for Asset Class Returns

Our assessment of global economic conditions, and their implication for asset class returns and portfolio allocation, is that the world faces four challenges, whose implications are interrelated and non-linear. The first challenge is the fragile nature of the global financial system, in which a very large amount of debt of highly uncertain quality rests on a very thin capital base. Another aspect of this issue is the precarious position of many parties that are struggling to repay and/or rollover that debt, including

households, some corporations (e.g., commercial property developers), financial institutions and various levels of government, up to and including some sovereign nations. A final aspect of this issue is the fact that in some countries, leverage has continued to increase in recent years (e.g., China), giving rise to new asset bubbles that will one day burst (e.g., Chinese property). In addition, strong money supply growth in the United States has not only helped to fund a substantial expansion of U.S. government debt (while keeping interest rates on that debt artificially low), but also led to strong capital flows into many emerging markets, where they have inflated both consumer and asset prices.

The second challenge facing the global economy is inadequate and imbalanced aggregate demand. In many countries, private sector balances (i.e., the difference between savings and investment) have swung from strongly negative to strongly positive since the global financial crisis exploded in 2008, as investment has been cut back and strenuous efforts have been made to save more in order to reduce outstanding debt. The resulting reduction in private sector demand has usually been balanced by a sharp expansion of government deficits and attempted expansion of the money supply, in order to avoid an even deeper economic contraction and more severe rise in unemployment. However, many countries are now either approaching or have reached the limit of this approach, with growing concerns about the sustainability of sovereign debt levels forcing consideration of policy alternatives. On top of this, in a world that has become globally interconnected to a degree not seen since the early 1900s, the benefits of these government stimulus programs have spread beyond domestic borders. This has benefited those nations that have been most reliant on exports for economic and employment growth, such as China, Germany, and Japan. In theory this has bought time for these nations to take steps to expand domestic demand (which in turn would allow nations running substantial current account deficits, such as the U.S. and U.K., to reduce them, and replace government deficits with rising exports as a source of GDP growth). Indeed, this is one of the fundamental assumptions that underlie the “muddling through” scenario, which describes a slow, but steady recovery from the Great Recession. In practice, however, we are seeing

once again the truth of the old adage that “no plan survives its first contact with reality.” It is proving very difficult (for political, social and economic reasons) to increase domestic demand (and in particular, private consumption spending) in current account surplus countries, while in current account deficit countries a rising number of people are questioning the logic of a policy which seems to burden them and their children with debt in order to create jobs in China and other surplus countries, while unemployment remains stubbornly high at home.

The third challenge facing the world economy is how to avoid having more developed economies slip into an extended period of deflation, similar to Japan’s experience since the bursting of its property and equity bubble in 1989.

The final challenge facing the global economy is how to maintain the legitimacy of various political institutions, both international (e.g. multilateral trading rules) and domestic in the face of economic and social stresses not seen since in most countries since the 1930s.

In essence, the “muddling through” scenario assumes that all these challenges will somehow be met, and that the main price we will pay is a prolonged period of slower economic growth (the truly rosy scenario assumes that rising domestic demand in emerging markets will cause them to become the new motor of the world economy, which in turn will return global growth to its previously high levels). The downside view assumes that we will fail to meet one or more of these challenges, and, given their complex and most likely non-linear interrelationships, the result will be a downside scenario whose severity will take many people by surprise.

Let us now turn to a review of recent evidence about how well these challenges are being met. Obviously, the survey that follows makes no claim to being comprehensive. Rather, from the steady torrent of information that flows by all of us each day, we will present the pieces of evidence that seem most significant. After presenting the evidence, we will present our conclusions as to what it means, both for what lies ahead for the global economy, and the implications for asset class returns and portfolio allocation.

Excessive Leverage

- In the household sector, we observe that debt/income and house price/rent ratios remain quite high in Canada and Australia, two countries which have, thus far, avoided the worst of the Great Recession due to the demand growth provided by commodity exports. Both countries are thus heavily exposed to demand growth in China, which has been critical to the maintenance of high prices for many commodities. However, Canada may face a sooner day of reckoning, as its economy is also heavily exposed to natural gas prices and exports to the United States, which are now being displaced by rapidly rising domestic U.S. production of unconventional (and particularly shale) gas. To some extent, rising exports of unconventional oil may offset this; however, these exports are not only exposed to “China demand risk”, but also to physical constraints on exports, with the construction of key export pipelines from Alberta to ports in British Columbia still blocked by litigation brought by a number of First Nations Bands (i.e., native American tribes, for those of you who don’t speak Canadian).
- In China, evidence continues to mount as to the size of the property market bubble that has arisen from that nation’s rapid credit growth. In “Evaluating Conditions in Major Chinese Housing Markets”, Wu, Gyourko and Deng note that “using data from the local land auction market in Beijing, we are able to produce a constant quality land price index for that city. Real, constant quality land values have increased by more than 800% since the first quarter of 2003, with half that rise occurring over the past two years.” They ominously conclude that “even modest declines in expected price appreciation rates would lead to large price declines of over 40% in markets such as Beijing.” More recently, in its annual Economic Blue Paper, the Chinese Academy of Social Sciences concluded that a typical Chinese property now costs 8.8 years of an average workers earnings, and that house prices were still rising far faster than average

wages. We find this highly significant, since one of the best indicators that a housing bubble is about to collapse is when first-time buyers (who enable “move up” purchases by those above them) are priced out of the market.

- In the United States’ household sector, the latest Household Debt and Credit Developments report from the Federal Reserve Bank of New York showed that at the end of the third quarter of 2010, about \$1.3 trillion of consumer debt (mortgages, home equity lines, credit card, student and auto loans) was delinquent, of which \$928 billion was seriously (more than 90 days) delinquent. Essentially, there has been no change in this metric over the past year. To put this in perspective, between 2007 and 2009 total consumer debt charge-offs by U.S. financial institutions amounted to \$600 billion, or about \$200 billion per year. To put this in perspective, according to the U.S. Bureau of Economic Analysis, the total domestic profits of all companies in the U.S. financial sector in 2009 amounted to \$211 billion (and remember, a good portion of those profits were questionable, resulting, for example, from changes in reported values of assets that are not regularly traded). In short, consumer debt problems in the United States have not gone away, and continue to represent a very serious threat to the financial system. Moreover, this threat continues to be made worse by the many legal obstacles to restructuring home mortgage loans.
- In an article in the 4November10 *Financial Times*, Gillian Tett drew an analogy between the problems in Japan in the 1990s that were caused by that country’s failure to come to terms with the large number of “zombie loans” in its banking system, and similar problems being caused by similar policies in the United States’ today. As she notes, “the lesson from Japan remains valid: without market clearing asset prices, it is hard to rebuild real trust and confidence.” Elsewhere in that day’s FT, Carmen and Vincent Reinhart urged that it was “Time To End the Denial Over Mortgage Debt”, noting that, “Financial authorities have to end the charade that the problematic loans made as the real

estate bubble inflated will be repaid. Those loans and the securities using them as collateral had dicey prospects when first made and have only gone further south. After all, since the balloon popped, real estate prices have fallen 35 percent on average, and unemployment is near 10 percent. These unresolved legacy assets are dragging down households' spirits, clogging intermediaries' balance sheets, and impeding the clearing of the real estate market. The private sector will not borrow, banks will no lend, and the fiscal prospects of the U.S. government will be clouded" [until this problem is resolved]...Ending the current counterproductive policy of denial will raise the already bloated fiscal deficit, through some combination of higher resolution costs and further capital injections [into banks]. But acceding to the inevitable is never optional, only the timing has an element of discretion. That said, the longer it takes to recognize financial losses, the larger they ultimately become."

- In the next day's FT, John Authers linked the announcement of a new round of quantitative easing (purchase of government and other debt) by the U.S. Federal Reserve to continuing problems in the housing market. He noted that "mortgage rates have fallen further than U.S. Treasury yields, making houses more affordable than ever, but house sales remain depressed. If housing stays moribund, this will have two serious negative effects. First, there will be more defaults, and thus more damage to banks' balance sheets. Second, people will continue to not be – or feel- rich, and hence will not spend much" (previous research having demonstrated that the housing market "wealth effect" is much more powerful than the equity market "wealth effect").
- Further contributing to the dire condition of the U.S. housing market has been the so-called "foreclosure" crisis, in which many litigants have shown that the legal procedures used by banks to foreclose on their homes were deficient. This has forced banks to offer even deeper price discounts on foreclosed homes, in order to offset increased buyer uncertainty about their legal title to a

property and the sharp increase in the cost of title insurance. On top of this, and despite years of price declines, a recent article showed that, in many U.S. markets, price/rent ratios are still well above the long term average of 15 (“Buy vs. Rent: An Update” by David Leonhardt in the 22Dec2010 *New York Times*). As Leonhardt noted, “It’s pretty amazing when you think about it. The country has suffered a terrible crash in home prices, yet buying a house remains an iffy proposition in many markets.” Of course, the flip side of this is that in these markets it appears that the percentage of homeowners with negative equity continues to be understated.

- This naturally leads some commentators to wonder why, in light of these circumstances, rates of strategic mortgage defaults aren’t even higher than the relatively high and rising rates that have been observed in the United State. For example, a recent paper concluded that, in terms of consumer credit scores, the consequences of such defaults were more manageable than many consumers apparently realize: “The credit score drops an average of 51 points when a borrower becomes 30 days delinquent, but the effect is much more muted to transitions to more severe delinquency states and even foreclosure” (“Determinants and Consequences of Mortgage Defaults”, by Demyanyk, Koijen, and Van Hemert). As Brent Arends asked in a recent Wall Street Journal column, (“The Great Mortgage Mystery”, 8Oct2010), “the big question from the mortgage meltdown isn’t why so many distressed homeowners are defaulting on their loans. It’s why any of them are still making payments” when, after they stop paying, “in many cases they may get to live in the home rent-free for months, even years, until the bank gets around to seizing it.” As Arends concludes, “the economy will suffer if more homeowners default. But it will suffer if they don’t. Those bad debts are doomed and need to be written off. Why should the homeowners eat them rather than the banks?...A mortgage isn’t a blood oath, it’s a business contract – a collateralized loan. It isn’t simply a promise to repay the lender. It’s a promise to repay the lender or to forfeit the

home. Isn't someone simply fulfilling their contract by handing over the keys when asked?"

- As many commentators have noted over the past few years, problems in property loan portfolios extend beyond residential mortgages. Many commercial property mortgages are also underwater. The latest writer to highlight this issue is Gillian Tett, in the 30Dec2010 *Financial Times* ("Commercial Property Loans Pose New Threat"). She writes, "what will happen to the financial system if U.S. interest rates keep rising? That is a question many investors are pondering, given the recent sharp upward swing in US Treasury yields...The recent turbulence in Ireland, where banks were devastated by CRE exposure, is a potent reminder of the potential for property loans to turn sour. And it is just possible that echoes of this problem might be seen elsewhere in 2011. For one dirty secret in the financial world is that the lack of drama in the CRE sector has partly arisen because banks on both sides of the Atlantic have been 'evergreening' loans [also known as "extend and pretend"] – or in essence, extending maturities and practicing forbearance to avoid recognizing losses. Banks and borrowers have been able to conduct such evergreening because interest rates have been at rock bottom. But if rates rise, this evergreening will be harder to maintain. What makes this doubly pernicious is that any rise in rates might hit just as the sector is heading into a wave of refinancing...about \$1.4 trillion of CRE loans must be refinanced before 2014. Alarmingly, nearly half of these loans are at present underwater."
- Another place where rising interest rates could wreak havoc is China, where loan growth has been aggressive and many government entities and corporate borrowers have loaded up on leverage, encouraged by negative real interest rates. However, as Hyman Minsky and others have repeatedly shown, such conditions are almost guaranteed to produce overinvestment in marginally profitable assets, whose value quickly turns negative when interest rates rise.

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- Unfortunately, global nominal interest rates seem likely to continue their recent increase, for three reasons. First, a recent analysis by the McKinsey Global Institute (“Farewell to Cheap Capital: The Implications of Long Term Shifts in Global Investment and Savings”) concludes that rising investment demands in emerging markets and falling saving rates (due to an ageing developed country population, and China’s efforts to boost domestic consumption) will, over the next 20 years, put upward pressure on real interest rates. However, the analysis also concludes that “real long term rates may start moving up within five years, as investors start to price this long term structural shift.” Second, the continued aggressive expansion of money, credit, and fiscal deficits around the world has already begun to increase the inflation risk premium. Third, some combination of rising commodity prices (due to rising demand and increasingly expensive marginal sources of supply) and strengthening economic recovery (which authorities will likely be reluctant to choke off via an aggressive reduction in the money supply) should eventually produce increases in consumer price inflation.
 - Taken together, worsening debt problems in the household and non-financial corporate sector will likely put increasing pressure on financial institution balance sheets in the years ahead (as well as the balance sheets of the U.S. Treasury and Federal Reserve, due to the de facto nationalization of Fannie Mae and Freddie Mac). In turn, this will likely put further pressure on governments’ fiscal deficits as well as central bank balance sheets as they are forced to support larger numbers of distressed banks (and remember, as regularly tracked by calculatedriskblog.com, just in the U.S. the unofficial “problem bank list” already contains almost 1,000 institutions).
 - Many banks (and insurance companies – another hidden source of systematic risk) may also face losses on the portfolios of public sector loans and bonds that they hold. In previous issues, we have written at length about the

worsening municipal debt crisis in the United States. In recent months, we have been joined by many other commentators who share this view. To be sure, there are countervailing voices, who cite the lack of defaults up to now, and municipal governments' ability to raise taxes, if necessary, to make payments on their debt. We are not so sanguine. In our view, in many towns, cities, counties and states, there are four parties seated at the proverbial poker table: taxpayers (who vote and can move); public sector unions (who also vote in large numbers); the social welfare industry (e.g., beneficiaries, non-profits who depend on government funding, and their supporters, who also vote in large numbers); and bondholders. In many cases, taxpayers are struggling, public sector benefits (pensions and post-retirement healthcare) are woefully underfunded, demand for social programs is rising (due to both structural changes like Obama Care, and continuing high levels of unemployment), and budget deficits are at unprecedented levels. Perhaps we spent too many years in South America; however, it strikes us that in this game, which is primarily political, with very short term time horizons, the bondholders are holding the weakest hand, and at some point will almost certainly be asked to "share the pain" of fiscal adjustment. However, as events in 2010 have amply shown, the government debt problem extends beyond municipalities and states, and up to the national sovereigns themselves.

- Over the years, we have repeatedly noted the critical difference between flows (e.g., the size of the annual fiscal deficit that must be financed via borrowing, on top of the maturing debt that must be rolled over) and stocks (e.g., the ratio of outstanding debt or interest payments thereon, to GDP, tax or export revenue). We have also repeatedly referred to one of our favorite bits of timeless wisdom: things that can't go on forever, don't go on forever. In this case, at some [uncertain] point, the stock of outstanding government debt imposes a limit on the amount of new flow – e.g., the size of the fiscal deficit that can be run, or a country's ability to rollover maturing debt. A more formal expression of this

concept is known as the Debt Trap: if the rate a nation must pay on its debt exceeds its rate of growth, in order for the stock of debt to remain stable, it must run a fiscal surplus, before debt service payments. And if the stock of debt is to be reduced, that surplus must be even larger. The Debt Trap concept features prominently in both the IMF's October World Economic Outlook (WEO) and the October Global Financial Stability Review (GFSR). The analysis in the former concluded that "changes in both interest rates and exchange rates are important to the [fiscal] adjustment process. [However], when countries cannot rely on the exchange rate channel to stimulate net exports [i.e., devaluation], as in the case of global consolidation [i.e., when many nations are all simultaneously attempting to improve their government fiscal balances], and cannot ease monetary policy to stimulate domestic demand due to the zero interest rate floor, the output [GDP growth] costs of fiscal consolidation are much larger. Thus, in the presence of the zero interest rate floor, there could be large output costs associated with front-loaded fiscal retrenchment implemented across all the large economies at the same time."

- In the GFSR, the IMF noted that "the financial turmoil that engulfed parts of the Euro area in April-May provided a stark reminder of the close linkages between sovereign risk and the financial system...In countries perceived as the most vulnerable by markets, an adverse feedback loop developed, with widening sovereign spreads raising concerns about bank exposures [because of the large amount of sovereign debt held by some banks]. In turn, this drove up counterparty risks, and led to higher bank funding costs...With each cycle, the affected sovereign's ability to backstop its financial system came into further doubt, as rising funding costs raised the magnitude and likelihood of bank interventions by the sovereign." The report goes on to note that "long-term solvency risks arising from high public sector indebtedness have the potential to crystallize into sovereign funding difficulties over the shorter term as a result of high debt rollover requirements and large primary deficits...In the event of a

disruption in government bond markets, bank holdings of sovereign debt can quickly propagate one economy's stresses to the entire region, via the disruption of bank funding sources." The Federal Reserve's recently released data on the amount of support it provided in 2008 and 2009 to non-U.S. financial institutions provides a taste of the incredible scale of this problem, and the rapidity with which it can develop. And no one doubts it can happen again.

- The Debt Trap equation also highlights the four options facing many governments today, as they attempt to reduce the debt/GDP ratios that exploded in the wake of the global financial crisis and Great Recession which followed. The most attractive option is to gradually grow your way out of your debt problem, by achieving a nominal growth rate that exceeds the nominal rate of interest you must pay on your debt. However, as noted above, this is much easier said than done when (a) most other countries are in the same boat, and are also trying to increase their growth rates; (b) many other countries are also trying to work down high levels of household and government debt, which place limit on domestic demand growth; and (c) powerful political constituencies resist structural reforms that are critical to increased productivity and growth. This combination of circumstances is a recipe for just what we see today: increasingly intense competition for export market share, which in most cases meets with frustration, and in turn results in increased pressure for exchange rate changes, capital controls, and/or trade barriers.
- Frustration of growth as a solution to a government's debt problem then leads to another difficult choice we see all around us today: between austerity and inflation as the right "second best" solution. Austerity requires sharp cuts to government spending, and/or tax increases to generate a government budget surplus before interest payments. In theory, prolonged government austerity may also lead to lower interest rates on its debt (as the threat of higher inflation is reduced) and/or faster real growth (though in the face of an overleveraged

household sector and weak export markets, this seems quite a stretch). The problem with austerity, as we have also seen in 2010, is its political sustainability, particularly in democracies. This was painfully highlighted in the November OECD Economic Outlook. The OECD estimated the change in primary government balances (expressed as a percent of GDP) that would be needed to stabilize the debt/GDP ratio by 2025. The following table shows the OECD estimate of different countries' primary balance in 2010, the OECD estimate of additional spending governments will have to undertake between 2010 and 2025, as a consequence of the ageing of their respective populations, and the change in the primary balance that will have to be achieved in order to stabilize the debt/GDP ratio. As you can see, given the current starting points, the expected fiscal balance impact of increased age related spending, and the change in fiscal balance required to stabilize debt/GDP the "austerity challenge" facing most, but not all governments is nothing short of Herculean.

Country	Primary Govt Balance in 2010, %GDP	Projected Age Related Changes in Public Spending, 2010-2025, %GDP	Primary Govt Balance After Increased Age Related Spending	Primary Balance Required to Stabilize Debt/GDP in 2025	Required Change in Primary Govt Balance (Col5-Col6), %GDP
Australia	-1.6%	-1.2%	-2.8%	0.0%	2.8%
Canada	-2.8%	-2.5%	-5.3%	-0.5%	4.8%
Germany	-0.7%	-2.5%	-3.2%	0.8%	4.0%
France	-3.2%	-1.8%	-5.0%	1.0%	6.0%
Italy	2.0%	-2.5%	-0.5%	2.3%	2.8%
Spain	-4.7%	-3.2%	-7.9%	0.0%	7.9%
United Kingdom	-5.0%	-2.0%	-7.0%	1.2%	8.2%
United States	-7.0%	-2.1%	-9.1%	1.4%	10.5%
Japan	-5.5%	-2.9%	-8.4%	3.7%	12.1%
Switzerland	0.0%	N/A	0.0%	-0.1%	-0.1%

- In contrast to austerity, inflation initially appears to offer something of a free lunch, as it holds out the hope of raising the nominal growth rate above the nominal rate paid on the government's debt. Unfortunately, this argument rests on two underlying assumptions that are highly questionable today. The first is that rising inflation won't result in a reduction in the real rate of growth (the nominal rate being a combination of the real rate plus inflation). In all likelihood it will, which requires a higher rate of inflation to produce a given rate of nominal growth, and therefore a more painful period down the road when attempts are

made to reign inflation back in. The second assumption is even more difficult – the effectiveness of the inflation approach is directly proportional to (a) the average maturity of the government’s debt; (b) the percentage of the debt that bears a fixed rate of interest; and (c) particularly if you are faced with an older population (which relies on fixed income investments), the percentage of the debt held by foreign investors (who won’t vote against you in the next election for having eroded the real value of their savings). Unfortunately, the average maturity of most nations’ government debt is relatively short. The following table shows the practical implications of this for the viability of the “inflate away the real value of our debt” strategy. It assumes that all debt is fixed rate, with a nominal coupon of 5%. The average maturity in years is shown in the second column (based on data from *The Economist*). The third column shows the reduction in the value of the debt that results from inflation increasing by 5% -- e.g., so that the required nominal yield on the debt is now 10%. As you can see, while inflation certainly reduces the value of the debt, it falls well short of a substantial reduction. On the other hand, when it comes to inflation, what this table leaves out can be as important as what it contains. While in most countries, home mortgage loans are primarily of the adjustable rate variety, in the United States and France, fixed rate mortgages predominate. Hence, in these two countries there would be important additional sources of real debt burden reduction via a deliberate policy of raising the inflation rate (moreover, given the longer average maturity of mortgage loans, the benefit from a 1% rise in inflation would be greater than in the case of shorter maturity government debt).

Country	Average Maturity	Price Reduction
Australia	4.9	-19%
Canada	6.0	-22%
Germany	5.6	-21%
France	7.0	-24%
Italy	7.2	-25%
Spain	6.4	-23%

Country	Average Maturity	Price Reduction
United Kingdom	13.7	-36%
United States	4.8	-18%
Japan	5.5	-20%
Switzerland	6.4	-23%

- The analysis thus far makes it clear why growth, austerity, and inflation are all imperfect solutions to the problem of how to reduce government debt levels. It also makes clear why expectations are rising that at least some governments will decide to turn to the fourth strategy (one all-too-familiar to emerging market veterans): default (or, the more polite terms, restructuring or exchange offers). However, as noted above, the problem with this approach is its potential consequences for the banking system, and the likelihood that it would set off a destructive feedback loop between falling confidence in a government's willingness and ability to pay its debt without resorting to partial default, and falling confidence in the banks that hold that debt, and rely on government for their ultimate support. Of course, this feedback loop can be stopped in its tracks if the government's debt is denominated in its own currency, and it controls the issuance of that currency. That is certainly true for the United States, Australia, Canada, Japan, the UK and Switzerland. However, it is not true for the nations in the Eurozone – and for that reason, an increasing number of analysts are questioning the ability of the Eurozone to survive the fiscal and banking challenges that lie ahead.
- Finally, the scale of the fiscal challenge facing almost all OECD countries, and the increasing likelihood that its solution will ultimately require the use of all four approaches (growth, austerity, inflation and debt restructuring, albeit in different amounts in different countries), coupled with the relatively short average maturity of most governments' debt, makes it almost certain that future years will see a sharp rise in uncertainty tied to "rollover risk", or the ability of different

governments to successfully refinance maturing debt, and the price (bond yields) that will have to pay to accomplish this, and persuade investors to continue to buy their bonds (e.g., see an interesting recent article by Bethany McLean on the prospects for just such a crisis in Japan – “Too Big to Bail: Is Japan the Next Major World Economy to Tank?”).

Inadequate and Imbalanced Aggregate Demand

- At the country level, aggregate demand is equal to the sum of spending on private consumption, private investment, government spending net of taxes, and exports net of imports. From this one can derive the economic identity we have used so often over the years, which specifies that the private sector balance (total output less private consumption less private investment) plus the public sector balance (government spending less taxes) must equal the external balance (also known as the current account surplus or deficit, or exports less imports). Countries running current account deficits generate higher levels of aggregate demand than they can supply internally. Countries running current account surpluses obtain aggregate demand for their excess output by supplying deficit countries.
- Over the past thirty years or so, the key dynamic driving the world economy was the strong growth in aggregate demand in the United States (and the Anglosphere more generally), fueled by rising levels of household and financial sector leverage, that enabled other countries and regions to run current account surpluses. There were two main beneficiaries of this dynamic. The first was China, where the leadership of the Communist Party faced a deepening legitimacy crisis in the wake of Tiananmen Square. Deng Xiaoping’s response to this was, in 1992, to reemphasize the benefits of his program of reforms and openness (the so-called four modernizations of agriculture, industry, technology and the military), and indirectly, make successful economic growth the new

basis for the political legitimacy of the ruling party. The implementation of this program was greatly aided by the United States' de facto policy of constructive engagement with China, in the era right after the collapse of the Soviet Union, based on the underlying assumption that a prosperous China integrated into the global economy would reduce the threat to western security posed by the last great communist state. This approach generated the rapid expansion of Chinese exports and the nation's current account deficit, as companies around the world relocated supply chains to China to take advantage of the nation's cheap and quite well educated workforce. This generated rapidly rising profits at many Chinese exporters, which, rather than being distributed to shareholders, were reinvested (a very substantial portion of China's high savings rate has been due to this process). This rapidly rising level of investment was also accompanied by substantial amounts of both legal and illegal technology transfer, which further boosted China's external competitiveness and stimulated further growth in both corporate profits and savings, and the nation's current account surplus. As well-detailed in the writings of Michael Pettis (mpettis.com), China supported rapid export growth with unprecedented levels of investment spending, financed via the repression of private consumption. The second main beneficiary of this dynamic was commodity exporting countries, which saw a sharp rise in global demand for their natural resources, which in turn led to substantial increases in their prices, as increasingly costly sources of supply were brought into production.

- The net result of this dynamic was rising current account deficits in the United States, and rising current account surpluses in China and commodity exporting countries, with the latter two reinvesting large portions of their rising foreign exchange reserves in U.S. dollar assets, which in turn held down U.S. and global interest rates, enabling larger amounts of debt to be taken on by borrowers. And then, in 2007-2008, this process reached its end, when the stock of debt relative to borrowers' income hit its effective limit, and an old

truism reasserted itself: while rising leverage magnifies the pleasure on the way up, so too it magnifies the pain on the way down.

- Confronted with collapsing private sector demand in the developed world, both China and the United States took aggressive action. The former unleashed a very aggressive expansion of money and credit, to finance a sharp increase in domestic infrastructure and other forms of investment spending. The latter unleashed the balance sheet of the Federal Reserve to prevent a collapse of the global financial system, and the balance sheet of the U.S. Treasury to prevent a collapse in global demand. Two years on, what has the use of all this public sector fiscal and monetary firepower bought us? Global aggregate demand has recovered, though it remains weak and precariously dependent on very high levels of debt financed public sector spending. With debt/GDP levels approaching or exceeding 100% in many western nations, fixed income investors are increasingly worried about what lies ahead (though even a cursory knowledge of financial history, from the Bible on, could give them a pretty good idea about the answer to that question). It is clear that recent high levels of public sector spending cannot continue. Yet private sector spending remains generally weak, and unemployment high, with private consumption and private investment spending constrained by a combination of high debt levels and high uncertainty about future economic and political conditions. Moreover, resentment continues to grow over the fact that China's current account surplus has remained very strong – in effect, western taxpayers have born a substantial part of the burden of stimulating the Chinese economy, and limiting the rise of unemployment there. However, China is also facing the negative consequences of its policy response, in the form of rising inflation (itself socially destabilizing), a world-class property bubble, growing credit quality crisis that is made worse by the opaque nature of its financial system (a storyline whose end we should know by now), and rising tensions with its main trading partners.

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- The right economic responses to the current situation seem clear: in the United States (and Anglosphere more generally), reduction of the private sector debt burden (and mortgages in particular), to enable a resumption of private consumption, employment, and investment that in turn will enable a reduction in government fiscal deficits and stabilization of debt/GDP ratios while still maintaining acceptable levels of aggregate demand and unemployment. These initiatives should be complemented by efforts to reduce effective exchange rates, to stimulate exports and reduce imports. In China, the logical response includes initiatives to increase private consumption spending to reduce dependence on export demand; to reduce inflation; and to contain the financial system consequences of the property bubble. Indeed, these are the key components of the “rosy scenario” that implicitly underlies the increases we have seen in many equity markets and valuations in 2010.
 - Unfortunately, to a large extent these policies are not being implemented, and as a result the world economy continues to face a dangerous situation of inadequate and imbalanced aggregate demand. In the United States, potentially beneficial steps to reduce the overhang of bad mortgage debt (such as various debit/equity conversion proposals) have been blocked by a combination of legal uncertainties related to securitization (e.g., were certain mortgages fraudulently transferred to securitization vehicles, who actually owns the mortgages, and who must approve any debt/equity or principal reduction, etc.?), legal uncertainties related to foreclosures, banks holding second liens on the mortgaged property (such as home equity lines of credit), and worries over how widespread mortgage restructurings might affect already thin bank capital bases and future credit extensions. This keeps uncertainty high, which in turn holds down consumption spending, business investment, and hiring, keeping unemployment high and further reinforcing uncertainty in something approaching a vicious circle. On the exchange rate front, it appears that developing countries, the most prominent of which is China, would prefer to see

rising domestic inflation rather than allowing their exchange rates to rise against the U.S. dollar. In economic terms, having a higher inflation rate than the U.S. for goods that are traded internationally will increase a nation's real effective exchange rate versus the U.S. dollar. However, this process is likely to play out over a longer time frame than a straightforward exchange rate appreciation, and therefore lengthen the time required for an increase in U.S. exports to occur.

- In China, the political leadership appears to be resisting anything that smacks of a risky policy change (e.g., cutbacks in bank lending and state enterprise investment spending, or an increase in the exchange rate versus the U.S. dollar) ahead of the transition to new state and party leadership that is scheduled to occur in 2012. The key uncertainty is whether the costs of this policy – including rising inflation, worsening trade relations with the United States and a growing number of developing countries, and growing asset bubbles (especially in property) – can be sustained until then.
- However, even in the unlikely case that these costs can be born without major incident (domestic and/or international), there is still a good chance that the rate of Chinese GDP growth will slow over the coming year. As Michael Pettis has noted (“Chinese Growth in 2011” mpettis.com, 19Dec10), “it is proving very difficult to keep growth up in China, except with massive increases in bank-driven investment, even though this year China got a lot of help from the surge in the trade surplus. Next year, I suspect it will be much more difficult to count on a surging trade surplus to generate domestic growth, and consumption is not going to kick in so we are pretty much left with growing investment” and likely a slowdown in GDP growth. Pettis goes on to note “too many economists are seriously underestimating how difficult the transition to a new growth model is going to be”. This is a point also made with growing frequency by the *Financial Times*. For example, an editorial in the 21Oct10 issue (“The Challenge Facing China”) notes that with respect to China's efforts to boost domestic demand,

“the evidence is not encouraging. Household consumption was only about 7 percent higher in the first nine months of 2010 compared with the same period in 2009. In contrast, fixed asset investment increased 24 percent.” Others have noted that the growth in China’s current account surplus in 2010 was much larger than the growth in domestic private consumption.

- Other analysts are increasingly coming to the conclusion that even without a major crisis, a slowing in Chinese GDP growth is inevitable. For example, a recent article on the Council on Foreign Relations’ website, “The Rising Chinese Consumer” concludes that it will be five years “before the Chinese consumer becomes a formidable force in the global economy” – and that assumes that key policy changes are made on schedule and have the expected effect. Elsewhere, an excellent analysis by Morgan Stanley’s Global Economics team (“Chinese Economy Through 2020: How Growth Will Decelerate” by Wang, Ho and Zhang) uses a model familiar to our readers, in which potential growth is a function of changes in the labor force, capital and total factor productivity. They begin by noting that “there are a number of studies in the academic literature that attempt to estimate the contributions of capital, labor and TFP to China’s GDP growth. According to these studies, capital accumulation [e.g., more capital per worker, including infrastructure capital] has contributed the most to growth [perhaps as much as half], and labor growth the least. There is also broad consensus in the literature that China’s TFP growth has been quite strong. [However] looking ahead, all these factors are likely to decelerate over the coming decade. Rapid ageing implies slowing labor supply growth. Population ageing will also reduce household savings.” This will be reinforced by growing age related spending demands on the state, which will force the government to demand dividend payments from State Owned Enterprises and thereby reduce corporate savings. In turn, the reduction in savings will reduce capital formation. Finally, the authors note that “improvement in TFP comes from two main sources. First, reallocation of labor

from low-productivity activity (e.g., farming in rural areas) to high productivity activity (i.e., manufacturing in urban areas).” In the coming years, the authors expect potential TFP gains from this process to diminish. The second source of TFP improvement is technological innovation and structural adjustment. Here the authors conclude that “while the Chinese economy may continue to benefit from technological innovations over the next decade, potential TFP gains stemming from structural reform are unlikely to be as strong as over the previous three decades.”

- A slowdown in Chinese growth and reduced savings will have significant, if uncertain, consequences for economic demand. On the positive side, it should lead to lower energy prices, which, especially in the case of oil, have recently approached the \$100/barrel level that many analysts believe could have a significant adverse impact on the already faltering global economic recovery. On the negative side, however, falling commodity prices would lead to lower or negative growth in major commodity exporting countries like Australia and Canada. Perhaps more important, falling Chinese growth might lead to intensified efforts to expand exports, which would have the effect of siphoning off demand from developed market economies (via displacement of domestic output and employment by imports from China) where it is already weak.

Deflationary (and Inflationary) Pressures

- In the United States, it is clear that in the matter of inflation versus deflation risk, the Federal Reserve regards the latter as by far the greater of two evils. Hence it continues to aggressively expand the money supply (e.g., via the second round of so-called “quantitative easing”, or the purchase by the Fed of U.S. government and agency securities), in an attempt to implant in investors’ mental models an expectation of higher inflation in the years ahead. As can be seen in the recent increase in U.S. government bond yields, the Fed has achieved a

measure of success, which is no mean feat when you consider the considerable deflationary pressures that still face the U.S. economy.

- These include continued downward pressure on housing prices as the extended and uncertain deleveraging saga plays out, high levels of unemployment (that, together with falling household wealth) continue to limit consumer spending; continuing downward pressure on most household incomes from both outsourcing and technological substitution, industrial capacity utilization that was still at only 75% in November 2010, and unrelenting downward price pressure in many industries from both stretched and stressed consumers and foreign imports (with the latter driven by continued expansion, in a growing number of industries, of surplus production capacity, especially in China).
- Beyond this, in the global battle between deflationary and inflationary forces, there is a very important political dimension that investors should not overlook, and which promises to intensify in the years ahead. To put it simply, nations with large current account surpluses (such as Germany and China) would like to see most of the burden of global adjustment born by nations running current account deficits, such as the United States, via a period of severe austerity and deflation, that would generate a reduction in their real effective exchange rates versus the surplus countries. Granted, given the struggles facing China as it attempts to move towards a more domestic consumption-driven economy, one also suspects that they would not like to see the United States make this change overnight. On the other hand, dramatic overnight change is exactly what Germany has demanded of Greece and Ireland.
- In contrast, nations running current account deficits would prefer to see the brunt of adjustment undertaken in the current account surplus countries, via structural economic reforms (e.g., to increase domestic consumption demand in China) and appreciation of their exchange rates versus the deficit countries.

- In the absence of any indication that surplus countries are willing to undertake such change, the U.S. Federal Reserve is effectively attempting to make it for them, by ramping up money supply growth in the nation that issues the world's most important reserve currency (the U.S. dollar). By holding down U.S. interest rates via its aggressive securities purchases, and in so doing also substantially increasing liquidity, the Fed has incentivized a tremendous volume of financial flows into emerging markets, including China. In turn, these flows have confronted policymakers in these nations with a stark choice: (a) accept higher domestic inflation – and perhaps the social and political instability that comes with it – as well as an increase in the real effective exchange rate versus the U.S. dollar; (b) Allow the explicit exchange rate to appreciate versus the USD, even if that will result in lost exports and reduced economic growth of competing exporters do not also simultaneously allow their exchange rates to appreciate; or (c) impose controls to limit capital inflows, knowing that they could ultimately lead to the imposition of trade controls by the United States and other importers that would cut exports and economic growth.
- As the *Financial Times'* Martin Wolf has noted (“Why America is Going to Win the Global Currency Battle”, 12Oct2010), “the U.S. must win [this battle], since it has infinite ammunition: there is no limit to the dollars the Federal Reserve can create. What needs to be discussed is the terms of the world's surrender: the needed changes in nominal exchange rates and domestic policies around the world.”

Eroding Political Legitimacy

- While the challenges of deleveraging, demand, and deflation are the most visible, history tells us that the declining legitimacy of many political institutions is the most dangerous issue we face as the Great Recession grinds on.

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- Over the past few years, we have written about the framework we use to think about issues related to political and social change. Many authors have described how complex systems usually adapt to growing stress, until a tipping or “punctuated equilibrium” point is reached, and dramatic change ensues, though usually not before the system has first provides a series of subtle hints that it is approaching a transition into a new regime. In the political context, the writings of the late economist Mancur Olson ([The Rise and Decline of Nations](#)), Jonathan Rauch ([Demosclerosis](#)) and Walter Russell Mead (“The Blue Model Breaks Down”), all describe situations in which a dense network of interest groups prevents a political or governance system from adapting to changes in its external environment, leading to its eventual demise. On a slightly different note, Joseph Tainter (“Social Complexity and Sustainability”) has described how social complexity grows as a system is confronted with and adapts in the face of increasingly complex problems. However, this growing complexity also inhibits the system’s response to external change, resulting in one of three outcomes: “collapse, resiliency through simplification; or continuity based on growing complexity and the increasing energy demand needed to support it.”
 - Today, examples of the phenomena described by these authors are much in evidence. Let us start with the international economic, trade and monetary systems. In the past two decades, we have arguably experienced two, if not three structural changes that are on a par with the much slower transition from an agricultural to an industrial based economy. The first has been the movement from an industrial economy to one far more dominated by information and communications technology, and by services as a share of global GDP. The second has been the achievement of a level of globalization not seen since the end of the 19th century, before the onset of World War I. And the third has been an increase of approximately 40% in the size of the global labor force, as China and India have become integrated into the world

economy, with the former in particular employing a very aggressive mercantilist strategy.

- The negative impact of these changes on the world's workers has been jarring, with countless jobs either replaced by technology, outsourced to countries with lower unit labor costs (i.e., wages adjusted for differences in output per hour and output quality), or redefined to include significantly higher skill requirements (see, for example, "Skills, Tasks and Technologies: Implications for Employment and Earnings" by Acemoglu and Autor). Yet at the same time, these changes have enabled the top 1% of the global labor force, and particularly those employed in financial services, to capture a far greater percentage of global income than in the past, leading to a dramatic increase in inequality.
- Capital has also faced tremendous change, ranging from the rapid accumulation of new capacity in many industries (particularly by Chinese companies), as well as widespread disregard (again, with China leading the way) for international laws governing the protection of intellectual property.
- At the macro level, these changes have given rise to tremendous changes in global flows of goods, services, and money, resulting in unprecedented current account surpluses and deficits (as a percentage of GDP). Moreover, absent substantial political changes, in the future these imbalances seem more likely to grow than to shrink (see the excellent new paper, "Global Imbalances in Retrospect and Prospect", a recent speech by the Bank of England's Andrew Haldane). The larger, and probably more important issue, however, has been the singular inability of international political institutions to cope with the consequences of all these changes, from the inability of the IMF to force current account surplus countries to allow their exchange rates to appreciate, to enforcement of intellectual property laws and treaties, to the World Trade

Organization's rules regarding illegal trade subsidies and government procurement rules that discriminate against foreign suppliers, to what seems to be the increasing irrelevance of the World Bank and its anti-poverty (and, more recently, pro-environment) mission. Put differently, reality on the ground has far outdistanced the capabilities of the governance mechanisms meant to control it, leading to increasingly severe consequences for a growing number of countries and workers, and rapidly falling popular legitimacy of many international political institutions.

- The same process has been underway in the Eurozone, which in 2010 struggled through the Greek and Irish sovereign debt crises, a pseudo-banking crisis (which led to its questionable stress tests), and rising worries about potential sovereign and banking crises in Portugal and Spain. In 2010, it became painfully obvious that debt issued by governments that lack control over their own currency (i.e., which cannot use devaluation and inflation to reduce their current account and government deficits) is not, in the true sense, sovereign. It also became increasingly obvious how interlinked the Eurozone's sovereign and financial system debt crises really are, with the latter so heavily invested in the former, and, worryingly, also being so much larger (i.e., the "too big to save" problem). Perhaps most important of all, it also became obvious that Germany, the economically healthiest and largest country in the Eurozone, strongly preferred punishing austerity (grudgingly supported with some financial support) as the means of resolving the region's sovereign debt crises, despite the potential blowback losses that could be sustained by heavily exposed German banks. Predictably, this was followed by popular protests in the affected countries at the proposed austerity plans, falling tax revenues and worsening government fiscal deficits as austerity began to bite, and rising calls for emerging market-style sovereign debt restructuring. As Robert Samuelson noted ("Irish Debt Crisis Isn't About Ireland", realclearmarkets.com, 29Nov2010), "Most European economies suffer from the ill effects of some

combination of easy money, unsustainable social spending, and big government budget deficits... Europe's challenge is no longer just economic. It's also social and political. Cherished values and ideals are under assault. The Euro, intended to nurture unity, has bred discord, as countries assign blame and argue over sharing costs. The social contract is being rewritten, with government benefits and protections being cut...Whether the gamble will succeed is unclear, as are the potentially chaotic consequences if it doesn't." Needless to say, the legitimacy of the Eurozone's political institutions has been rapidly eroded by the semi-paralysis and constant stream of half-measures in the face of a crisis that visibly continues to worsen. In a 5Dec2010 *Financial Times* column, Wolfgang Munchau noted Eurozone political leaders' "tendency to repeat the same mistakes", "lack of political coordination", "breakdown of communication", "tendency to blame investors when something goes wrong, rather than solve the problem", and "tendency to blame each other", before concluding that "there is a German word that describes the Eurozone's crisis management rather well. It is 'uberfordert', the nearest English translation for which is 'overwhelmed', and 'unable to cope.'"

- In post-Tiananmen Square China, the political legitimacy of the Communist Party, and (consistent with centuries of Chinese history), the legitimacy of the central government vis-a-vis provincial leaders, has rested on its ability to deliver rising levels of employment and improving living standards, along with growing respect for China on the world stage, which have offset growing domestic frustration with endemic corruption and widespread environmental problems. This is the modern equivalent of the Chinese emperors' historical striving to maintain the "mandate of heaven." As previously noted, China is currently facing a 2012 leadership succession and different political factions maneuvering for position when Xi Jinping takes over, which creates an obstacle to winning approval for economic reforms that could lead to increased private consumption, though at the likely cost of a short-term increase in

unemployment, which in turn could lead to social unrest and possibly push the legitimacy of the central government beyond a tipping point, as has happened so often throughout Chinese history. This political stasis is having a number of consequences. Externally, China's current account surplus, and its trade surplus versus the United States, have both continued to increase, capturing some of the benefits from trading partners' anti-recession monetary and fiscal stimulus initiatives, and further raising already heightened tensions with them (e.g., see "China's State Capitalism Sparks a Global Backlash" in the 16Nov2010 *Wall Street Journal*). Internally, the slow pace or absence of policy adjustment has resulted in rising inflation, the further expansion of the property bubble, and, beneath it, a growing credit quality problem in the financial system – and these on top of the new set of popular demands (e.g., higher wages, better healthcare) that will result from rapid ageing, reflecting the long-term impact of China's famous "one child" policy.

- Adding further to the already building tensions, jailed democracy advocate Liu Xiaobo was awarded the Nobel Peace Prize in October. As the Financial Times noted (on 8Oct2010), "by bestowing the peace prize on Mr. Liu, the Nobel committee has reinvigorated the clash of ideas between the human rights and democracy agenda promoted by most developed countries and China's authoritarian model, which has produced rapid and sustained economic growth."
- Given rising external and internal pressures on the Chinese system, and the growing threats they pose to the ruling regime's political legitimacy, it should come as no surprise that we have seen a sharp increase in Chinese nationalism and a more aggressive attitude toward the West in 2010 (e.g., see "U.S. Alarmed by Harsh Tone of China's Military", by Michael Wines in the 11Oct2010 *New York Times*; "The Remilitarization of Beijing" in the 21Sep2010 issue of *The Diplomat*; "The Coming of the Chinese Hawks" by David Lai of the

Strategic Studies Institute; or the “2010 Report to Congress” by the U.S.-China Economic and Security Review Commission). Perhaps the best analysis of this trend that we have read is “An Assertive China: The New Normal?” by Minxin Pei in the 24Nov2010 issue of *The Diplomat*. The author begins by noting that “it wasn’t all that long ago that China could do no wrong. Besides its seemingly unstoppable economic growth, the country was said to be acquiring soft power, earning respect and charming its way around the world. Its leaders were regarded as smart, sophisticated, and far-sighted. Its diplomats were praised as diligent, knowledgeable and smooth. It’s doubtful that such adjectives would be applied to them today.” Pei’s first point is that, in contrast to the west’s perception of a rising threat posed by China, “the Chinese themselves – both its leaders and ordinary citizens – don’t see their recent conduct as assertive at all. In their eyes, China has merely been defending its legitimate national interests.” However, he also believes that the rising tensions we observe are due to more than conflicting perceptions. He notes that three deeper dynamics are at work: (1) “the rapid shift in the balance of power between the West and China”. (2) “The weakening or disappearance in recent years of some of the key constraints on the exercise of Chinese power”, including rising economic strength, the weakening economic power of Western nations, and the continuing commitment of substantial amounts of U.S. military power to the Middle East and Southwest Asia. And (3) “the Communist Party’s eagerness to show the Chinese people its international prestige and influence as a source of political legitimacy. Pei’s analysis concludes on a somber note. Insofar as rising domestic and international trade strains lead to increased emphasis on Chinese nationalism and military strength as sources of the regime’s political legitimacy, it will come into conflict with the growing frustrations of the West: “Three decades of economic engagement hasn’t delivered the anticipated political dividends. Instead of an internally democratizing and externally cooperative great power, China now increasingly appears to be challenging not only Western economic and military supremacy, but also its core liberal values.

So Western patience is wearing thin, and disillusionment with Beijing [and indeed the strategy that has been followed for the past thirty years] is growing...We are entering a prolonged period of elevated tensions and more frequent disputes between China and the West – the ‘new normal’ in geopolitics.” And one, we might add, in which it is far easier for misperception and miscalculation to lead to a rapidly escalating conflict.

- In the United States, the roots of the growing political legitimacy crisis lie in the failure of a “governance system” led by two increasingly polarized parties to reverse the sharp decline in middle class living standards brought about by the information revolution, globalization, and the rise of China, even as this same system has facilitated the rise of a new super-wealthy elite and an unprecedented rise in inequality (e.g., see “The Inequality that Matters” by Tyler Cowen, and “The Rise of the New Global Elite” by Chrystia Freeland). Walter Russell Mead has characterized this situation as the “failure of the Blue State Model” and the policy elite it has spawned, which even now seeks to blindly defend it. He notes that, “what worries me most today is the state of the people who should be the natural leaders of the next American transformation: our intellectuals and professionals...The biggest roadblock today is that so many of America’s best-educated, best-placed people are too invested in old social models and old visions of history to do their real job and help society transition to the next level. Instead of opportunities they see threats; instead of hope they see danger; instead of the possibility of progress they see the unraveling of everything beautiful and true. Too many of the very people who should be leading the country into a process of renewal that would allow us to harness the full power of the technological revolution and make the average person incomparably better off and more in control of his or her own destiny than ever before are devoting their considerable talent and energy to fighting the future.” (We find Mead’s writing consistently thought provoking; see <http://blogs.the-american-interest.com/wrm/>)

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- Looking around the United States today, one finds plenty of reasons for middle class frustration. Take health care. Poll after poll found that a majority of Americans were dissatisfied with aspect of the U.S. healthcare system, which should have created a basis for bipartisan legislation to improve the functioning of the current system. What resulted instead was ObamaCare which seems to have satisfied almost nobody, while doing little or anything to address one of America's most critical issues: health care costs that are rising much faster than the rate of inflation. Or take education. Today, the unemployment rate for college educated workers is much lower than for those without a degree. This is consistent with a world in which, absent a willingness to accept a sharply lower standard of living, American workers can only compete in a global economy by becoming much more skilled. Yet the teachers unions still dig in their heels and resist meaningful reform of the public schools. Of course, as a growing chorus notes, this is but one part of a much larger problem: public sector workers who enjoy much better benefits than their private sector counterparts, who aggressively resist both compensation cuts and the same radical improvements in productivity and customer value added that globally competitive private sector firms and workers have been undertaking for the past two decades. And what about the growing public sector debt? Two recent reports – the first from the National Commission on Fiscal Responsibility and Reform (the so-called “Bowles/Simpson” report), and the second from The Debt Reduction Task Force (the “Dominici/Rivkin” report) both presented very credible medium term plans for reducing the United States' fiscal deficit, and eventually stabilizing its debt/GDP ratio. Politically, both of them seem to have been dead on arrival (barring a dramatic change of heart on the part of the Obama administration). As Robert Samuelson noted, in an excoriating column, “America's budget problem boils down to a simple question: How much will we let programs for the elderly displace other government functions – national defense, education, transportation, and many others – and raise taxes to levels that would, almost certainly, reduce economic growth? What's depressing is that this question has

been obvious for decades, but our political leaders have consistently evaded it...Our political culture prefers delusion to candor.” (“The Politics of Avoidance” realclearpolitics.com, 22Nov2010). Then there is the problem of job creation, or, more accurately, the lack of it. Having thrown the proverbial kitchen sink at a faltering economy, via unprecedented fiscal deficits and monetary stimulus, and seen employment growth react so tepidly, the Obama administration has turned to the bully pulpit and “getting more friendly with business leaders”, rather than addressing the uncertainties and structural issues that lie at the root of the problem. Taken together, these and other issues help to explain the striking lack of confidence that Americans have today in political institutions, in comparison to public attitudes at the depth of the Great Depression (see “How a Different America Responded to the Great Depression”, by the Pew Research Center).

- A recent column by Tom Friedman did an excellent job of capturing our take on the underlying political legitimacy issues in America today. In “Got to Get This Right”, (*New York Times*, 27Nov2010), he writes: “I think what’s driving people’s pessimism today are two intersecting concerns. The long-term concern is that people intuitively understand that what we need most now is nation-building in America. They understand it by just looking at our crumbling infrastructure, our sputtering job-creation engines, and the latest international education test results that show other countries out-educating us, which means they will eventually out-compete us...But I think they [also] understand something else: that we are facing a really serious moment. We have to get this plan for nation-building right because we are driving without a spare tire or a bumper. The bailouts and stimulus that we have administered to ourselves have left us without much cushion...We have to get this moment right...[and] it will require hard choices... We don’t get a do-over. If we fail to come together and invest, spend and cut really wisely, we’re heading for a fall – and if American becomes weak, your kids won’t just grow up in a different country, they will grow up in a

different world” (for a deeper – and disturbing -- exploration of the latter, see Matthew Continetti’s article, “A World in Crisis: What the Thirties Tell Us About Today”).

- In sum, wherever we look today, we see the political legitimacy of institutions and elites rapidly eroding. With the exception of the fall of the Soviet Union, we are hard pressed to cite historical examples of when similar situations produced significant improvements in the current situation. Instead, our mind is drawn to the United States in the second half of the 19th century (a period of tremendous economic and political disruption, which produced a civil war, Robber Barons and three presidential assassinations), Edwardian Europe in the first decade of the 20th century, and the early 1930s in Asia and Europe. History teaches us that dramatic change can occur much more quickly than most people think possible; more recently, advances in the neurobiology of fear, complex adaptive systems and network theory have helped us to understand the underlying mechanisms that produce these results. The key point is this: As in other cases of systems approaching tipping points, we believe that political systems today are producing signals that, absent significant reductions of the building tensions, they too may be approaching a critical threshold, beyond which lies rapid, substantial, and largely unpredictable change.

Conclusions

- The world economy faces four critical, interrelated challenges today: (1) How to reduce excessive debt levels and strengthen a very fragile financial system, without driving the global economy into an even deeper crisis than the one from which we are only now weakly emerging? (2) How to revive global aggregate demand to levels that will generate substantially higher levels of employment and income growth, while simultaneously reducing the substantial current account imbalances that have developed over the past decade? (3) How to

avoid an extended period of deflation in developed countries, without an extended period of inflation in developing countries? And (4) How to maintain the political legitimacy of current institutions and elites, and avoid a collapse of the current world political-economic system?

- Of course, this assumes that all the parties involved in these problems would prefer to avoid the above mentioned collapse in the current world political-economic system. In the case of the current Chinese leadership (to say nothing of the current Iranian leadership, along with a number of other governments), this may not be the case. In the past, we have suggested that one can reach a set of conclusions at disturbing variance to the conventional wisdom by applying some of the insights of Sun Tzu to the past ten years leading up to the present situation. For example, “To win one hundred victories in one hundred battles is not the acme of skill. To subdue the enemy without fighting is the acme of skill... Victorious warriors win first and then go to war, while defeated warriors go to war first and then seek to win...All warfare is based on deception... Engage people with what they expect; it is what they are able to discern and confirms their projections. It settles them into predictable patterns of response, occupying their minds while you wait for the extraordinary moment — that which they cannot anticipate.”
- Even in the absence of malicious intent, it could also easily be the case that the apparent paralysis affecting the world’s key political systems – in China, the Eurozone, the United States, and the main international institutions – will prevent the resolution of the deleveraging, demand and deflation challenges before their combined impact triggers one or more episodes of dramatic political change.
- In sum, we believe it is probable (i.e., about a 2 in 3 to 3 in 4 chance) that the rosy scenarios for 2011 and beyond that characterize the conventional wisdom

at the end of 2010 will be prove overly optimistic, and that a period of intensifying crises will characterize the next five years.

- As to the nature of those crises, as we have repeatedly noted, our crystal ball is far from perfect, and the best way to improve forecast accuracy is to combine our views with those of other analysts. That said, we believe that a crisis in China is likely to occur (e.g., a 1 in 2 chance), and that it could result (as already happened in Thailand) in a much stronger role for the military, in an alliance with the newly enriched middle class seeking to protect their gains. This would also result in a more aggressively nationalist China, and a much higher level of military tension in its relationship with the United States.
- Elsewhere, we expect the Eurozone to undertake a series of sovereign debt restructurings, which in turn will likely require the nationalization of one of more major banks. Current predictions that Greece or Portugal will leave the Eurozone are likely to prove false, as the transition costs would prove daunting, assuming their previously issued sovereign debt remained denominated in Euros. We are less confident that Ireland will remain in the Eurozone, as the attractions of a closer relationship with other Anglosphere countries, particularly in a world of trading blocs and capital controls, may be irresistible.
- In the United States, we believe that, over the protests of banks and many large corporations, the political cost of continuing high unemployment and intractable municipal debt problems (which will be made worse by declining tax revenue in a weak economy), along with China's unwillingness or inability to change its aggressively mercantilist policies (likely accompanied by a rise nationalism and aggressive military policy), will eventually trigger the imposition of much stronger trade and capital controls, coupled, we expect, with some type of compulsory domestic savings program (i.e., something like the Australian Superannuation funds), which would accompany the raising of minimum

retirement ages, and the introduction of means testing for state-provided retirement benefits. We would also expect to see new taxes as part of this package, most likely a VAT or some type of carbon tax (to stimulate investment in new energy and environmental technologies, which would also reduce the possible impact of Iranian actions in the Middle East). Imposition of these policy changes would, for a time, disrupt global supply chains, but would likely remain politically popular provided it forced a significant amount job creation back to the United States, while also providing a higher pool of savings to finance public and private sector borrowing (as I recall, people weren't marching in the streets to protest Nixon's ending of the gold standard in 1971).

- We also believe that some type of mortgage debt/equity conversion program will eventually be enacted, to remove this very substantial obstacle to increased private consumption spending (the alternative being accelerating defaults and foreclosures, and likely the need for aggressive federal support and/or temporary nationalization of more banks). Similarly, it seems to us that an extended period of higher inflation is inevitable in the United States, as it will have the twin benefit of reducing the real value of the country's stock of mortgage, municipal and federal debt. However, we don't expect smooth sailing in the United States. In particular, there is a risk that popular frustration with current political institutions and elites could pass a tipping point, if critical middle class reforms are not enacted, either by the currently dominant parties, or by a new third party. In our view, the most important of these reforms include measures to contain the rapid rise of health care costs, reform public education, and either significantly reduce the current cost of unfunded public employee benefits, or, alternatively, dramatically reengineer public sector organizations, systems and processes to deliver substantially higher value to taxpayers. If these reforms are not enacted – if middle class frustration in the U.S. continues to build – then the U.S. may join a long list of South American democracies that have turned to the military to implement long overdue changes. Granted, if you

have lived your whole life in the United States, or in the Anglosphere, this may sound shocking. However, those who have lived in South America, saw the collapse of the Balkans in the early 1990s, or endured the last months of the Callaghan government in the U.K. may see things differently. Democracy is a far more fragile system than most people realize, and change can come swiftly, though usually from a predictable direction.

- Over the past five years or so, our downside scenario has been defined by a world in which globalization collapsed as a result of the inability of political institutions and elites to limit the growing costs it generated, with a world of trading blocs arising to replace it. We still hold to that view, but with a significant change. As a result of China's recent actions, we believe that it is now far less likely to become the center of a bloc, and that the world system that will replace the present one will more closely resemble the global alliance that arose after World War II to contain the Soviet Union.
- We realize that this has probably not been an easy article to read, and not just because of its length (which we believe was necessary to fully lay out our line of argument). It is both intellectually and emotionally hard to consider another substantial (and perhaps more permanent) departure from what has been a relatively predictable economic and investing environment over the past 30 years (from the point when people concluded in the early 80s that Paul Volcker really meant business). Psychologically, we are designed to assume linearity and predictability, and real or expected departures from that provoke high anxiety. Yet history shows that such dramatic changes have happened more often than most people probably would guess. And people with a fiduciary duty to, at minimum preserve, and ideally to increase the real value of other people's assets cannot flinch from considering these scenarios, however challenging and fear inducing they may be.

Asset Class Implications

- Real Return Government Bonds: Those issued by creditworthy government (e.g., Anglosphere, Scandanavia, Germany, Netherlands) should continue to provide a valuable inflation hedge. Real yields will likely remain low in the near future, until the fundamental changes are made in the system, after which they should rise, reflecting a radically different situation with respect to the supply and demand for funds. However in the near term they should provide an excellent hedge against rising inflation. As previously noted, even under the “business as usual” scenario, analysts at the McKinsey Global Institute have concluded that rapid ageing and other policy changes in high savings countries (notably China), combined with rising investment demand in emerging markets, will lead to an increase in real interest rates around the world. So, bottom line: excellent inflation hedge in the near term, but potential negative returns in the medium term as structural trends and/or dramatic changes cause real yields to increase.
- Nominal Return Government Bonds: A much dodgier proposition, with rising inflation likely to occur in many countries over the next few years. Best bet is to shorten maturities in an attempt to keep even with inflation. At this point, investing in longer maturities seems decidedly unwise (though “suicidal” may be a better term). As for sovereign credit risk, we recommend following a simple rule: if the country in question does not print its own currency (as is the case throughout the Eurozone), it requires an additional credit risk premium (perhaps a large one at that, depending on the country) to hold the debt (except for Germany). Among the most popular sovereign issuers, we believe that the U.S. will benefit from the flight to quality effect when uncertainty spikes, as will Switzerland and Germany. Among the commodity exporters, we would favor Canada and Norway over Australia, as the latter is the most highly exposed to changes in China. The U.K. is attractive because it has, relative to the rest of

Europe, a very flexible economy, and within the Anglosphere its markets provide the most liquid alternative to the U.S. Finally, we remain leery of Japan, given its ageing population (which, logically, should reduce savings levels), the continuing weakness of its political institutions (at least in terms of their ability to design and implement difficult structural reforms), and the government's continuing need to regularly rollover very large amounts of debt.

- Commercial Property: A reasonable inflation hedge, which makes it attractive. Also, at least in those countries with decent property law, a hedge against substantial political regime changes – hence the attractiveness of Swiss property these days. Under our trade and capital controls scenario, a lot of production will have to relocate back to the Anglosphere, Eurozone (including Eastern Europe, for this argument), and perhaps Latin America, which should help drive up property prices, rents and returns for industrial, warehouse, and office properties in these geographies.
- Commodities: Low real interest rates, strong Chinese demand, and, in some cases, exhaustion of low cost supply sources have all supported prices in recent years. Under all scenarios, real interest rates should increase, and given our view of the likely future evolution of growth (and therefore demand for commodities) in China, on balance we conclude that commodity prices are more likely to fall than rise in the medium term. However, in the short term, rising inflation could help to hold up prices. Also, as we have noted in the past, futures-based commodities investments increasingly suffer from a growing imbalance between passive long-only investors, and industrial hedgers who are net sellers. To some extent, speculators have stepped in to reduce this imbalance, but this has also resulted in them earning returns at the expense of the long-only futures buyers (put differently, many commodities futures curves have remained contangoed, with futures prices higher than spot, which generates negative roll yields for long-only futures investors).

- Gold: The growing prevalence of sovereign debt rollover crises, rising inflation, and a worsening situation in China should all provide support for further increases in the price of gold. However, as we have noted in the past, this process will inevitably reverse, so investing in gold bears more than a passing resemblance to the “beat the gun” contest described by John Maynard Keynes in the 1930s when referring to investments whose value was heavily dependent on the collective emotions of investors. On balance, we continue to prefer holding gold in the form of coins, which, in the worst case, are far easier to use for transactions than either ETF shares that can be redeemed in physical bullion or, worse, gold ETF shares that cannot be physically redeemed.
- Timber: It keeps growing, regardless of political or economic conditions. Granted, this physical growth can be offset by falling real prices when GDP growth is negative or low for an extended period. A key indicator here is resolution of the mortgage debt overhand problem, which should drive recovery in the housing market (also assuming a recovery of employment growth) and therefore in real timber prices. Timber is also a good inflation hedge, which should help support near term returns, even in the face of weak real GDP growth.
- Developed Market Equities: Neither inflation nor heightened political uncertainty is typically associated with high positive real equity returns. Moreover, valuation levels in many markets are currently quite high, in anticipation of the development of the “optimistic”, “rosy” or “Goldilocks” scenario in 2011 (take your pick of a name). On balance, we think the next few years will be hard ones for equities, with even high quality names suffering to the extent that their supply chains are disrupted by the imposition of trade and capital controls, and growing conflict between China and the West.

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- Developing Market Equities: At the risk of sounding like a broken record for regular readers, let me throw some cold water on the conventional wisdom's enthusiasm for this asset class. First, in many countries (especially in Africa and South America) realization of the currently forecasted high future rates of real GDP growth will require a substantial investment in infrastructure that has often suffered from years of neglect. We continue to wonder just who will provide the necessary financing, particularly given the highly politicized nature of many infrastructure projects' pricing and revenue streams. Over years spent in South America, we have seen popular political resistance to price increases scupper more than one "infrastructure" deal (before that term became popular). Second, in so far as GDP growth in a developing country has been dependent on exports to China, tougher times could lie ahead. Third, even if you assume that infrastructure needs are met, and GDP growth forecasts realized, there is the very non-trivial issue that the correlation between real GDP growth rates and returns to equity investors usually ranges from low to non-existent. In too many developing countries weak property, contract, tort, and shareholder protection laws, and equally weak law enforcement and court systems, can easily result in hidden and visible costs that siphon away most of a company's revenue and cash flow long before it can potentially be distributed to equity investors. This is not to say that, over time, some momentum traders will not get rich exploiting other investors' herding into and out of developing equity markets. However, from the perspective of a long-term allocation to an asset class, we continue to believe that caution is the most prudent approach, particularly in light of the relatively high valuation levels at which many developing equity markets are trading today.
 - Volatility: In light of our view of the future, we logically expect spot volatility, as measured by the VIX Index, to increase. However, you cannot directly invest in the VIX, only in short and medium term futures contracts that are based on it. As in the case of a futures-based long-only commodity investment product, this

raises tricky issues about the future shape of the volatility futures curve over your investment horizon. In a period characterized by high uncertainty, it is not unrealistic to expect the price of a longer dated volatility futures contract to be higher than a shorter dated one (i.e., to expect the curve to be contangoed), and therefore generate negative roll yields. Of course, an investor could view those negative roll yields as a premium he or she pays to insure a portfolio against an unexpectedly large jump in volatility. In a world where we expect more and more such episodes to occur, some allocation to volatility makes sense to us, as insurance against tail risk.

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 10

<i>Australia</i>	Low Demanded Return	High Demanded Return
High Supplied Return	68%	101%
Low Supplied Return	102%	140%

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

<i>Eurozone</i>	Low Demanded Return	High Demanded Return
High Supplied Return	54%	90%
Low Supplied Return	90%	131%

<i>Japan</i>	Low Demanded Return	High Demanded Return
High Supplied Return	72%	134%
Low Supplied Return	144%	223%

<i>United Kingdom</i>	Low Demanded Return	High Demanded Return
High Supplied Return	30%	71%
Low Supplied Return	68%	116%

<i>United States</i>	Low Demanded Return	High Demanded Return
High Supplied Return	59%	123%
Low Supplied Return	131%	213%

<i>Switzerland</i>	Low Demanded Return	High Demanded Return
High Supplied Return	56%	100%
Low Supplied Return	102%	241%

<i>India</i>	Low Demanded Return	High Demanded Return
High Supplied Return	57%	154%
Low Supplied Return	184%	331%

<i>Emerging Markets</i>	Low Demanded Return	High Demanded Return
High Supplied Return	66%	157%
Low Supplied Return	107%	199%

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

Despite this, the months since March 2009 have seen a very strong rally develop in many equity markets, which, in some cases, has caused our valuation estimates to rise into the "overvalued" region. Given the absence of progress in reducing the obstacles that block a return to sustainable economic growth (see our recent Economic Updates), we believe that these rallies reflect investor herding, rather than a substantial improvement in the underlying fundamentals. In turn, we strongly suspect that the root causes of this herding phenomenon, which appears to have strengthened in recent years, lie in a combination of the rising percentage of assets (and even higher percentage of trading) accounted for by delegated asset managers (rather than the investors who own the assets being traded), the incentive structure faced by these delegated managers (e.g., 2 and 20 on this year's returns), and the rise of algorithmic trading.

Real Return Bonds

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

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

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

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

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

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

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

Region	Risk Free Rate Demanded	Actual Risk Free Rate Supplied	Difference	Overvaluation (>100) or Undervaluation (<100)
Australia	2.2	2.6	0.5	95
Canada	2.8	1.1	-1.7	118
Eurozone	2.9	1.8	-1.2	112
Japan	2.8	1.3	-1.5	116
United Kingdom	2.8	0.6	-2.2	125
United States	2.5	0.9	-1.6	117

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

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

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

Government Bond Markets

Our government bond market valuation update is based on the same supply and demand methodology we use for our equity market valuation update. In this case, the supply of future fixed income returns is equal to the current nominal yield on ten-year government bonds. The demand for future returns is equal to the current real bond yield plus historical average inflation between 1989 and 2003 plus a premium for inflation uncertainty. We use the latter two variables as a proxy for the average rate of inflation likely to prevail over a long period of time. To estimate of the degree of over or undervaluation for a bond market, we use the rate of return supplied and the rate of return demanded to calculate the present values of a ten year zero coupon government bond, and then compare them. If the rate supplied is higher than the rate demanded, the market will appear to be undervalued. This information is contained in the following table:

Bond Market Analysis as of 30 Nov 10

	Current Real Rate	Average Inflation (89-03)	Inflation Uncertainty Premium	Required Nominal Return	Nominal Return Supplied (10 year Govt)	Return Shortfall or Excess	Asset Class Over or (Under) Valuation, based on 10 year zero coupon	Implied Annual Inflation Over 10 Year Horizon
Australia	2.64%	2.96%	0.25%	5.85%	5.17%	-0.68%	6.63%	2.22%
Canada	1.08%	2.40%	0.25%	3.73%	2.81%	-0.92%	9.31%	1.46%
Eurozone	1.76%	2.37%	0.25%	4.38%	2.51%	-1.87%	19.83%	0.49%
Japan	1.27%	0.77%	0.25%	2.29%	0.92%	-1.37%	14.44%	-0.60%
UK	0.62%	3.17%	0.25%	4.04%	3.08%	-0.96%	9.68%	2.20%

	Current Real Rate	Average Inflation (89-03)	Inflation Uncertainty Premium	Required Nominal Return	Nominal Return Supplied (10 year Govt)	Return Shortfall or Excess	Asset Class Over or (Under) Valuation, based on 10 year zero coupon	Implied Annual Inflation Over 10 Year Horizon
USA	0.88%	2.93%	0.25%	4.06%	2.60%	-1.46%	15.19%	1.45%
Switzerland	1.37%	2.03%	0.25%	3.65%	1.54%	-2.11%	22.88%	-0.09%
India	1.37%	7.57%	0.25%	9.19%	8.14%	-1.06%	10.21%	6.42%

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

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

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

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

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

Assuming inflation levels revert to their long-term averages over a long time horizon, many government bond markets appear overpriced today (i.e., prevailing nominal yields appear to be too low). However, over a short-term time horizon, it may well be the case that many countries will first experience declining prices (deflation) before they experience a substantial rise in inflation. From this perspective, government bonds may be underpriced over the expected time horizon for deflation, but overpriced in the context of the substantial reflations that governments will eventually attempt (given that the economic consequences of deflation seem to be much worse than

those associated with higher than normal inflation). In sum, when it comes to questions about bond market valuation, one's time horizon assumption is critical.

Credit Spreads

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

The following table shows the statistics of the distribution of these spreads between January, 1986 and December, 2009. Particularly in the case of the BAA spread, it is clear we are not dealing with a normal distribution!

	AAA – 10 Year Treasury	BAA-AAA
Average	1.24	0.98
Standard Deviation	1.13	0.89
Skewness	0.47	0.42
Kurtosis	0.90	3.00

At **30 Nov 10**, the AAA minus 10 year Treasury spread was 1.98%. The AAA minus BAA spread was 1.05%. Since the distributions of AAA and BAA credit spreads

are not normal (i.e., they do not have a “bell curve” shape), we need to look at history rather than Gaussian (normal curve) statistics to put them into perspective. Over the past twenty-four years, 8.5% of all trading days had a higher AAA-Treasury spread. Over the same period, 30.5% of all trading days had a higher AAA-BBB spread.

Over a longer-term time horizon, when liquidity and credit risk premiums would be expected to return to their historical averages, one can argue that credit is underpriced today, given high prevailing yields (i.e., falling bond yields mean rising bond prices). However, the validity of that conclusion critically depends on one’s assumptions about future default rates and loss rates conditional upon default. A decision to buy 50,000 in bonds at what appears to be a very attractive yield from a long-term perspective can still generate negative total returns if the future default rate (and losses conditional upon default) more than wipes out the apparently attractive extra yield. And since the differences between current AAA and BBB spreads and their long-term averages (1.24% and .98%, respectively) are well under 100 basis points today, it doesn’t take much mis-estimation of future default rates (and/or losses conditional on default) to turn today’s apparently good decision into tomorrow’s painful outcome. And the “historically attractive yields” argument gets (non-linearly) less convincing the further down the credit ratings ladder you go. On balance, we think that even on a long-term view, credit likely overpriced today, given the increasingly uncertain economic outlook and difficulty in accurately estimating future default and loss given default rates.

Currencies

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

to forecasting equilibrium exchange rates over longer horizons, see “2009 Estimates of Fundamental Equilibrium Exchange Rates” by Cline and Williamson).

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

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

	To AUD	To CAD	To EUR	To JPY	To GBP	To USD	To CHF	To INR
From								
AUD	0.00%	-2.36%	-2.66%	-4.25%	-2.09%	-2.57%	-3.63%	2.97%
CAD	2.36%	0.00%	-0.30%	-1.89%	0.27%	-0.21%	-1.27%	5.33%
EUR	2.66%	0.30%	0.00%	-1.59%	0.57%	0.09%	-0.97%	5.63%
JPY	4.25%	1.89%	1.59%	0.00%	2.16%	1.68%	0.62%	7.22%
GBP	2.09%	-0.27%	-0.57%	-2.16%	0.00%	-0.48%	-1.54%	5.06%
USD	2.57%	0.21%	-0.09%	-1.68%	0.48%	0.00%	-1.06%	5.54%
CHF	3.63%	1.27%	0.97%	-0.62%	1.54%	1.06%	0.00%	6.60%
INR	-2.97%	-5.33%	-5.63%	-7.22%	-5.06%	-5.54%	-6.60%	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 Nov 10**: We use the dividend discount model approach to produce our estimate of whether a property market is over, under, or fairly priced today, assuming a long-term perspective on property market valuation drivers. The specific formula is

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

Country	Dividend Yield	Plus LT Real Growth Rate	Equals Supply of Returns	Real Bond Yield	Plus LT Comm Prop Risk Premium	Equals Returns Demanded	Over or Undervaluation (100% = Fair Value)
Australia	5.8%	0.2%	6.0%	2.6%	3.0%	5.6%	94%
Canada	4.5%	0.2%	4.7%	1.1%	3.0%	4.1%	85%
Eurozone	4.2%	0.2%	4.4%	1.8%	3.0%	4.8%	108%
Japan	7.1%	0.2%	7.3%	1.3%	3.0%	4.3%	57%
Switzerland*	3.1%	0.2%	3.3%	1.4%	3.0%	4.4%	134%
U.K.	4.2%	0.2%	4.4%	0.6%	3.0%	3.6%	81%
U.S.A.	3.8%	0.2%	4.0%	0.9%	3.0%	3.9%	96%

**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. While these factors tend to undermine one source of support for property prices, we also recognize that, at least in some markets, they can be offset by property's historical attraction as a means of preserving wealth in very difficult and uncertain times. In sum, we believe that the sharp run up in property security prices in recent months is due to some combination of investor over-optimism about the speed and size of economic recovery, and/or the tendency of institutional investors to herd rather than risk losing assets (or their jobs) due to their underperforming an asset class benchmark. Switzerland and the Eurozone may be exceptions to this view, in that rising uncertainty may have triggered increased demand for property in these markets.

Commodities

Let us now turn to the Dow Jones AIG Commodity Index (now known as the DJ UBS Commodity Index), our preferred benchmark for this asset class because of the roughly equal weights it gives to energy, metals and agricultural products. One of our core assumptions is that financial markets function as a complex adaptive system which, while attracted to equilibrium (which generates mean reversion) are seldom in it. To put it differently, we believe that investors' expectations for the returns an asset class is expected to supply in the future are rarely equal to the returns a rational long-term investor should logically demand. Hence, rather than being exceptions, varying degrees of over and under pricing are simply a financial fact of life. We express the demand for returns from an asset class as the current yield on real return government bonds (ideally of intermediate duration) plus an appropriate risk premium. While the former can be observed, the latter is usually the subject of disagreement. In determining the risk premium to use, we try to balance a variety of inputs, including historical realized premiums (which may differ considerably from those that were expected, due to unforeseen events), survey data and academic theory (e.g., assets that payoff in inflationary and deflationary states should command a lower risk premium than those whose payoffs are highest in "normal" periods of steady growth

and modest changes in the price level). In the case of commodities, Gorton and Rouwenhorst (in their papers “Facts and Fantasies About Commodity Futures” and “A Note on Erb and Harvey”) have shown that (1) commodity index futures provide a good hedge against unexpected inflation; (2) they also tend to hedge business cycle risk, as the peaks and troughs of their returns tend to lag behind those on equities (i.e., equity returns are leading indicators, while commodity returns are coincident indicators of the state of the real business cycle); and (3) the realized premium over real bond yields has historically been on the order of four percent. We are inclined to use a lower ex-ante risk premium in our analysis (though reasonable people can still differ about what it should be), because of the hedging benefits commodities provide relative to equities. This is consistent with the history of equities, where realized ex-post premiums have been shown to be larger than the ex-ante premiums investors should logically have expected.

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

The second source of the return on a long-only commodity index fund is the so-called “roll yield.” Operationally, a commodity index fund buys futures contracts in the most liquid part of the market, which is usually limited to the near term. As these contracts near their expiration date, they are sold and replaced with new futures contracts. For example, a fund might buy contracts maturing in two or three months, and sell them when they approached maturity. The “roll yield” refers to the gains and

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

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

growing, while marginal supplies are more expensive to develop and generally have long lead times), it is not clear that historical tendencies toward backwardation or contango are a good guide to future conditions.

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

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

However (and this is a critical however), this Theory of Storage analysis assumes that there is no change in the relative supply of investors willing to purchase futures contracts sold by commodity producers. This assumption has been violated in recent years, which have seen a dramatic increase in the amount of investment committed to long-only commodity futures based index funds. Some observers have argued that this increase in demand for commodity futures has overwhelmed any changes that have taken place on the supply side that are driven by the Theory of Storage. They conclude that this has resulted in a permanent change in the structure of many commodity futures markets that has made contangoed conditions, and hence negative roll returns, much more likely. We are persuaded of the logic of this

argument, which is why in our model portfolios we now use products (e.g., the ETF LSC), that can take both long and short positions in commodity futures, based on market supply and demand conditions as evaluated by an algorithm (technically, this produces an index that the fund tracks; however, for all intents and purposes, these are active quantitative strategies).

Given the continued presence of so many contangoed futures curves, expected near term roll returns on the DJAIG as a whole are still negative, absent major supply side shocks. On a weighted basis (using the DJAIG weights), the forward premium (relative to the spot price) at **30 Nov 10** was 1.09%, compared to 1.51% one month previously, 1.64% two months ago, and 1.93% three months ago. Remember, a forward premium means the roll return will be negative (because the futures investor will be selling the maturing contract at a lower price than he or she must pay to replace it with a longer-dated contract). Roll returns are positive only when there is a forward discount (when the average price of a futures contract with a long maturity is lower than the price of a contract with a very short maturity).

This brings us to the third source of return for long-only commodity futures funds: unexpected changes in the price of the commodity during the term of the futures contract. It is important to stress that the market's prevailing consensus about the expected change in the spot price is already included in the futures price that is paid when the contract is purchased. The source of return we are referring to here is the portion of the final realized price change that was unexpected when the futures contract was purchased. Given the large increase in funds committed to long-only, commodity futures based index investments, unexpected price changes have become a much more important source of return than they have been in the past. The good news is that this return driver probably offers skilled active investors the best chance of making profitable forecasts, since most human beings find it extremely difficult to accurately understand situations where cause and effect are significantly separated in time (e.g., failure to recognize how fast rising house prices would – albeit with a time delay – trigger an enormous increase in new supply). In this regard, large price surprises seem to be more frequent when supply and demand for a commodity are

finely balanced – the same conditions which can also give rise to changes in real option values and positive roll returns, under the Theory of Storage. However, given our economic outlook, at this point in time we view negative surprises on the demand side that depress commodity prices as more likely than demand or supply surprises that have the opposite effect. Put differently, on balance we expect price surprises to have a negative impact on commodity returns over the next year.

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

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

makes biofuels much more cost competitive). On balance, at **30 Nov 10**, we believe that returns on many commodity futures are more likely to be negative over the next year than positive; hence, using this analytical framework we conclude that commodities are likely overpriced today, using a one-year time horizon.

Another approach to assessing the valuation of commodities as an asset class is to compare the current value of the DJAIG Index to its long-term average. Between 1991 and 2009, the inflation adjusted (i.e., real) DJAIG had an average value of 90.99, with a standard deviation of 15.92 (skewness of .57, and kurtosis of -.07; i.e., it was close to a normal distribution). The inflation adjusted **30 Nov 10** closing value of 91.72 was an estimated .05 standard deviations above the long term average. Assuming the value of the index is normally distributed around its historical average (which in this case is approximately correct), a value within one standard deviation of the average should occur about 67% of the time, and a value within two standard deviations 95% of the time.

Whether the current level of the inflation adjusted DJAIG signifies that commodities are undervalued depends upon the time horizon being used. There are three arguments that, on a medium term (three to five year) view, commodities are underpriced today. The first is the large amount of monetary easing underway in the world, which, at some point, could lead to higher inflation. The second is the equally large amount of fiscal stimulus being applied to the global economy, and in particular, China, with its focus on infrastructure projects, should continue to boost demand for commodities (and indirectly boost economic growth in commodity exporting countries like Australia and Canada). The third is that the possibility that we will see a substantial fall in the value of the US Dollar versus other currencies, causing investors to increase their holdings of commodities as confidence in fiat currencies wanes.

The argument that commodities are overpriced today on a medium term view is based on the belief that (a) investment in clean fuels and other changes in environmental regulation will cause a permanent reduction in global demand for oil relative to supply (and oil receives a relatively heavy weight in most commodity indexes); (b) The inability to quickly resolve the economic challenges facing the world

economy will result in a prolonged period of weak or no growth (including a major slowdown in Chinese growth), which will reduce the demand for commodities; and (c) That in a scenario of prolonged global stagnation, investors will prefer to increase their holdings of short term government bonds, and perhaps gold, rather than increasing their holdings of a broader range of commodities.

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

Gold

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

In an article in our January 2010 issue, we described why we would expect the real price of gold to increase by about 1.75% per year under normal conditions. This is the difference between our assumed long-term growth rate of real global GDP of 3.25% per year and our assumed long-term growth rate of the world stock of gold of 1.50% per year. We can further expand our description of the supply of gold returns,

viewing 1.75% per year as the normal “income return” from holding gold, and adding to it the change in the price of gold that is driven by regime changes – i.e., changes in perceived uncertainty and expected inflation.

When we looked at the return for holding gold that an investor would logically demand, in terms of a risk premium above the real risk free interest rate, we found that it varied considerably depending on the regime that prevailed. In normal times, the risk premium has been negative (about 2.0% annually), reflecting the fact that gold plays the role of portfolio insurance, for which, in normal times, an investor should logically expect to pay, rather than receive, a risk premium. However, this insurance policy is expected to pay off under the high inflation and high uncertainty regimes, when the risk premium above the real risk free rate turns positive, ranging between 2.5% in the high inflation regime to 2.0% in the high uncertainty regime.

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

This raises the obvious question of how these variables change to restore the system to equilibrium when supply and demand are out of balance. That is not an easy question to answer. Under the normal (steady state) regime, the supply/demand balance is defined by the difference between 1.75% and the risk free rate less the “insurance premium” investors are willing to pay for gold. If the latter sum is greater than 1.75%, the price of gold should tend to increase. If it is less than 1.75%, the real price of gold should fall. So far, so good – and, more important, usually quite a stable return generating process. However, when the system shifts out of the normal regime, the relationship between the supply of and demand for returns from holding gold gets considerably more exciting. On the demand side there is a shift from a negative required risk premium to a positive risk premium, as the portfolio insurance provided by gold is expected to pay off. On the supply side, that should cause prices to rise by more than their long-term normal regime rate of 1.75% per year. The excitement

comes when that price increase triggers investor herding, and the price increase exceeds the amount required to match the supply of returns to the demand for returns. As the system is driven further away from equilibrium, with the apparent supply of gold returns exceeding the fundamental demand for gold returns by ever-greater amounts, it becomes more fragile, as maintaining a constant annual percentage increase in price of gold requires ever larger annual dollar increases in the price of gold. Eventually the system is driven back towards equilibrium, via a sharp decline in the price of gold.

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

At **30 Nov 10**, the yield on a 10-year USD real return bond was .74%, and we believe that the chances are high we are not in the normal regime, but rather in a situation in which most investors expect gold to pay a positive risk premium. So the real return demanded for holding gold should be around 3.00% per year. According to our approach, fair valuation of gold would require that the expected supply of real gold returns be of the same magnitude. However, over the last 12 months, the actual real return from holding gold (calculated using the change in the GLD ETF less the change in the US CPI) has been **15.9%**.

The recent pause in the accelerating upward climb in gold prices further reinforces the impression that the gold market may indeed be in a very fragile state. Conditions in the gold futures market further reinforce this view. Over the past few months, gold futures have become much less contangoed, with a recent forward premium (based on the price difference between the two nearest month contracts) of only .04%. While further negative surprises that raise perceived uncertainty could yet drive gold prices higher (the most powerful of which would be increased worries about the creditworthiness of U.S. Treasury securities), we conclude that at present gold is likely overpriced today, based on our fundamental valuation methodology. That said, when the inevitable price decline will occur is anybody's guess. This is very much a "beat the gun" market.

Timber

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

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

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

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

valuation analysis are readily available: the dividend yields on the timber REITS and the yield on real return bonds. The other two variables, the expected rate of growth and the appropriate risk premium, have to be estimated. The former presents a particularly difficult challenge.

In broad terms, the rate of dividend growth results from the interaction of physical, economic, and regulatory processes. Physically, trees grow, adding a certain amount of mass each year. The exact rate depends on the mix of trees (e.g., southern pine grows much faster than northern hardwoods), on silviculture techniques employed (e.g., fertilization, thinning, etc.), and weather and other natural factors (e.g., fires, drought, and beetle invasions). Another aspect of the physical process is that a certain number of trees are harvested each year, and sold to provide revenue to the timber REIT. A third aspect of the physical process is that trees are exposed to certain risks, such as fire, drought, or disease (e.g., the mountain pine beetle in the northwest United States and Canada). And fourth physical process is that, through photosynthesis, trees sequester a portion of the carbon dioxide that would otherwise be added to the earth's atmosphere.

In the economic area, three processes are important. First, as trees grow, they can be harvested to make increasingly valuable products, starting with pulpwood when they are young, and sawtimber when they reach full maturity. This value-increasing process is known as "in-growth." The speed and extent to which in-growth occurs depends on the type of tree; in general, this process produces greater value growth for hardwoods (whose physical growth is slower) than it does for pines and other fast-growing softwoods. At the level of individual timber investments, the rate of in-growth is a key driver of returns; however, at the asset class level, we have decided to assume a constant mix of grades over time. The second economic process (or, more accurately, processes) is the interaction of supply and demand that determines changes in real prices for different types and grades of timber. As is true in the case of commodities, there is likely to be an asymmetry at work with respect to the impact of these processes, with prices reacting more quickly to more visible changes in demand, while changes in supply side factors (which only happen with a significant time delay)

are more likely to generate surprises. In North America., a good example of this may be the eventual supply side and price impact of the mountain pine beetle epidemic that has been spreading through the northwestern forests of the United States and Canada. The IMF produces a global timber price index that captures the net impact of demand and supply fluctuations. The average annual change in real prices (derived by adjusting the IMF series for changes in U.S. inflation) between 1981 and 2007 was 0.1% (i.e., average prices over the period remained essentially constant in real terms), but with a significant standard deviation of 9.2% -- i.e., it is normal for real timber prices to be quite volatile from year to year.

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

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

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

Growth Driver	Assumption
Biological growth of trees	We assume 6% as the long term average for a diversified timberland portfolio. We stress that biological growth rates can vary widely for different types of timber investment (with softwoods and timber located in tropical countries delivering the highest growth, and hardwoods and timber in more temperate climates delivering the slowest growth rates). We have also changed our valuation model to assume a constant mix of product grades, to present a better approximation for timber as a global asset class.
Harvesting rate	As a long term average, we assume that 5% of tree volume is harvested each year. As a practical matter, this should vary with timber prices and the REITs prevailing dividend level. So 5% is a “noisy” long-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 a portion of timber's return generating process (physical growth) has zero correlation with the return generating processes for other asset classes, we should use an even lower risk premium. Again, we believe our approach is conservative in this regard. Given these assumptions, our assessment of the valuation of the timber asset class at **30 Nov 10** is shown in the following table. We use the dividend discount model approach to produce our estimate of whether timber is over, under, or fairly valued today. The specific formula is $(\text{Current Dividend Yield} \times 100) \times (1 + \text{Forecast Dividend Growth})$ divided by $(\text{Current Yield on Real Return Bonds} + \text{Timber Risk Premium} - \text{Forecast Dividend Growth})$. A value greater than 100% implies overvaluation, and less than 100% implies undervaluation.

Average Dividend Yield (70% PCL + 30% RYN)	4.45%
Plus Long Term Annual Biological Growth	6.00%
Less Percent of Physical Timber Stock Harvested Each Year	(5.00%)
Plus Long Term Real Annual Price Change	0.00%
Plus Other Sources of Annual Value Increase (e.g., Carbon Credits)	0.00%
Equals Average Annual Real Return Supplied	<u>5.45%</u>
Average Real Return Bond Yield	.88%

Plus Risk Premium for Timber	3.00%
Equals Average Annual Real Return Demanded	<u>3.88%</u>
Ratio of Returns Demanded/Returns Supplied Equals Valuation Ratio (less than 100% implies undervaluation)	<u>64%</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 measured by PCL and RYN, is likely overpriced today. On the other hand, whether looking over a short or long-term time horizon, if you believe that future revenues from timber's CO2 sequestration service are likely to be significant, and/or that four percent is too high a risk premium to use, then you could argue that timber is likely underpriced today.

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

Volatility

Our approach to assessing the current value of equity market volatility (as measured by the VIX index, which tracks the level of S&P 500 Index volatility implied by the current pricing of put and call options on this index) is similar to our approach to commodities. Between January 2, 1990 and December 31, 2009, the average daily value of the VIX Index was 20.29 (median 18.77), with a standard deviation of 8.36 (skewness 2.05, kurtosis 7.28 – i.e., a very “non-normal” distribution). On **30 Nov 10**, the VIX closed at 23.54. To put this in perspective, only 28% of the trading days in our sample had higher closing values of the VIX. In sum, at the end of last month, while volatility was high in historical terms, it was still at a level that we believe is inconsistent with the high uncertainty regime that we expect to prevail in global financial markets over the next year. For these reasons we concluded that volatility is likely underpriced over a one year time horizon.

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

Sector and Style Rotation Watch

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

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

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

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

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

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

*Rolling 3 Month
Returns Through*

30 Nov 10

<i>Economy</i>	Bottoming	Strengthening	Peaking	Weakening
<i>Interest Rates</i>	Falling	Bottom	Rising	Peak
<i>Style and Size Rotation</i>	Small Growth (DSG) 24.49%	Small Value (DSV) 16.86%	Large Value (ELV) 9.60%	Large Growth (ELG) 17.93%

Rolling 3 Month
Returns Through

30 Nov 10

Economy	Bottoming	Strengthening	Peaking	Weakening
Interest Rates	Falling	Bottom	Rising	Peak
Sector Rotation	Cyclicals (RXI) 19.30%	Industrials (EXI) 15.48%	Staples (KXI) 7.54%	Utilities (JXI) 0.94%
Bond Market Rotation	Higher Risk (HYG) 4.19%	Short Maturity (SHY) 0.13%	Low Risk (TIP) 1.53%	Long Maturity (TLT) -8.40%

Model Portfolios Update

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

We use two benchmarks to measure the performance of our model portfolios. The first is cash, which we define as the yield on a one year government security

purchased on the last trading day of the previous year. For 2010, our USD cash benchmark is 0.44% (in nominal terms). The second benchmark we use is a portfolio equally allocated between the ten asset classes we use (it does not include uncorrelated alpha). This portfolio assumes that an investor believes it is not possible to forecast the risk or return of any asset class. While we disagree with that assumption, it is an intellectually honest benchmark for our model portfolios' results.

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