The Index Investor

Invest Wisely…Get an Impartial Second Opinion.

Contents

August 2010 Issue: Key Points

We first wrote about deflation and liquidity traps back in May 2001. For the past few years, one of our scenarios has included a period of deflation, followed by the return of high inflation. Our fundamental view has been that three powerful deflationary forces would ultimately prove too strong to resist – the entry of an export-oriented China into the world economy, the displacement of jobs by increasingly sophisticated technology, and the inexorable rise of aggregate debt/GDP ratios in developed economies. Today, you can't pick up an investment periodical without reading about competing and contradictory forecasts that either deflation or higher inflation are just around the corner. Over the past fourteen years, we have learned that when your views become mainstream, it is time to re-examine them. For that reason, this month we take a closer look at deflation, including what it is, what causes it, why it is

dangerous, the chances that the United States will soon enter a period of deflation, and its potential impact on asset class returns. We conclude that there is a 50% chance that the U.S. will enter a period of mild deflation, and that, since theory and experience suggests it may be an alternative equilibrium condition, it will last longer than many people expect.

Deflation is one of the four critical challenges we believe the world faces today. The others are excessive leverage, insufficient and imbalanced aggregate demand, and increasing questions about the legitimacy of multilateral and domestic political institutions. These four challenges are characterized by complex interrelationships, and potentially non-linear effects. Put differently, they have considerable potential to surprise us if they depart from the "business as usual" or "we'll muddle through" assumption that seems to be the conventional wisdom today. This month's economic update examines the current state of affairs with respect to the leverage and aggregate demand challenges. We conclude that the evidence suggests a downside surprise is significantly more likely to occur than a relatively benign "muddling through" scenario. Next month we will examine the consequences of our developing views on leverage, demand and deflation for political legitimacy.

This month's product and strategy notes include a review of new research of interest to investors and their advisers, a preliminary look at new tail risk hedging products, and an examination of the poorly understood consequences of the arrival of The Borg: the growing use of very sophisticated trading algorithms.

Global Asset Class Returns

YTD30Jul10	In USD	In AUD	In CAD	In EUR	In JPY	In GBP	In CHF	In INR
Asset Held								
USD Bonds	6.68%	6.03%	4.89%	15.88%	-0.74%	9.70%	7.88%	6.40%
USD Prop.	15.88%	15.24%	14.09%	25.08%	8.46%	18.90%	17.08%	15.60%
USD Equity	0.57%	-0.07%	-1.22%	9.77%	-6.85%	3.59%	1.77%	0.29%
AUD Bonds	5.80%	5.15%	4.01%	15.00%	-1.62%	8.82%	7.00%	5.52%
AUD Prop.	-0.29%	-0.93%	-2.08%	8.91%	-7.71%	2.73%	0.91%	-0.57%
AUD Equity	-5.46%	-6.11%	-7.26%	3.74%	-12.88%	-2.44%	-4.26%	-5.74%
CAD Bonds	6.16%	5.51%	4.36%	15.36%	-1.26%	9.18%	7.36%	5.88%

YTD30Jul10	In USD	In AUD	In CAD	In EUR	In JPY	In GBP	In CHF	In INR
CAD Prop.	13.94%	13.29%	12.15%	23.14%	6.52%	16.96%	15.14%	13.66%
CAD Equity	3.27%	2.62%	1.48%	12.47%	-4.15%	6.29%	4.47%	2.99%
CHF Bonds	4.35%	3.71%	2.56%	13.55%	-3.06%	7.38%	5.55%	4.08%
CHF Prop.	13.83%	13.19%	12.04%	23.03%	6.41%	16.85%	15.03%	13.55%
CHF Equity	-4.67%	-5.32%	-6.46%	4.53%	-12.09%	-1.65%	-3.47%	-4.95%
INR Bonds	-0.41%	-1.05%	-2.20%	8.79%	-7.83%	2.62%	0.79%	-0.69%
INR Equity	2.22%	1.58%	0.43%	11.42%	-5.20%	5.24%	3.42%	1.94%
EUR Bonds	-1.75%	-2.40%	-3.55%	7.45%	-9.17%	1.27%	-0.55%	-2.03%
EUR Prop.	-0.64%	-1.28%	-2.43%	8.56%	-8.06%	2.38%	0.56%	-0.92%
EUR Equity	-12.36%	-13.00%	-14.15%	-3.16%	-19.78%	-9.33%	-11.16%	-12.64%
JPY Bonds	9.62%	8.97%	7.82%	18.82%	2.20%	12.64%	10.82%	9.34%
JPY Prop.	14.76%	14.11%	12.96%	23.96%	7.34%	17.78%	15.96%	14.48%
JPY Equity	-1.13%	-1.77%	-2.92%	8.07%	-8.55%	1.89%	0.07%	-1.41%
GBP Bonds	2.26%	1.62%	0.47%	11.46%	-5.16%	5.28%	3.46%	1.98%
GBP Prop.	-9.20%	-9.84%	-10.99%	0.00%	-16.62%	-6.18%	-8.00%	-9.48%
GBP Equity	-2.59%	-3.23%	-4.38%	6.61%	-10.01%	0.43%	-1.39%	-2.87%
1-3 Yr USGvt	2.06%	1.42%	0.27%	11.26%	-5.36%	5.08%	3.26%	1.78%
World Bonds	1.74%	1.09%	-0.06%	10.94%	-5.68%	4.76%	2.94%	1.46%
World Prop.	6.98%	6.34%	5.19%	16.18%	-0.44%	10.01%	8.18%	6.70%
World Equity	-1.62%	-2.27%	-3.42%	7.58%	-9.04%	1.40%	-0.43%	-1.90%
Commod Long Futures	-4.54%	-5.19%	-6.34%	4.66%	-11.96%	-1.52%	-3.34%	-4.82%
Commod L/Shrt	-21.73%	-22.37%	-23.52%	-12.53%	-29.15%	-18.71%	-20.53%	-22.01%
Gold	7.62%	6.98%	5.83%	16.82%	0.20%	10.64%	8.82%	7.34%
Timber	3.53%	2.88%	1.74%	12.73%	-3.89%	6.55%	4.73%	3.25%
Uncorrel Alpha	0.93%	0.28%	-0.86%	10.13%	-6.49%	3.95%	2.13%	0.65%
Volatility VIX	20.70%	20.05%	18.91%	29.90%	13.28%	23.72%	21.90%	20.42%
Currency								
AUD	0.64%	0.00%	-1.15%	9.84%	-6.77%	3.67%	1.84%	0.37%
CAD	1.79%	1.15%	0.00%	10.99%	-5.63%	4.81%	2.99%	1.51%
EUR	-9.20%	-9.84%	-10.99%	0.00%	-16.62%	-6.18%	-8.00%	-9.48%
JPY	7.42%	6.77%	5.63%	16.62%	0.00%	10.44%	8.62%	7.14%
GBP	-3.02%	-3.67%	-4.81%	6.18%	-10.44%	0.00%	-1.82%	-3.30%
USD	0.00%	-0.64%	-1.79%	9.20%	-7.42%	3.02%	1.20%	-0.28%
CHF	-1.20%	-1.84%	-2.99%	8.00%	-8.62%	1.82%	0.00%	-1.48%
INR	0.28%	-0.37%	-1.51%	9.48%	-7.14%	3.30%	1.48%	0.00%

Uncorrelated Alpha Strategies Detail

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

YTD 30Jul10	In USD	In AUD	In CAD	In EUR	In JPY	In GBP	In CHF	In INR
Eq Mkt Neutral								
HSKAX	-1.86%	-2.50%	-3.65%	7.34%	-9.27%	1.17%	-0.66%	-2.13%
OGNAX	-2.99%	-3.63%	-4.78%	6.21%	-10.41%	0.03%	-1.79%	-3.27%
Arbitrage								
ARBFX	0.32%	-0.33%	-1.48%	9.52%	-7.10%	3.34%	1.51%	0.04%
ADANX	1.30%	0.65%	-0.49%	10.50%	-6.12%	4.32%	2.50%	1.02%
Currency								
DBV	-1.83%	-2.47%	-3.62%	7.37%	-9.25%	1.20%	-0.63%	-2.11%
ICI	0.66%	0.01%	-1.13%	9.86%	-6.76%	3.68%	1.86%	0.38%
Equity L/S								
HSGFX	2.35%	1.70%	0.55%	11.55%	-5.07%	5.37%	3.55%	2.07%
PTFAX	6.29%	5.65%	4.50%	15.49%	-1.13%	9.31%	7.49%	6.01%
GTAA								

YTD 30Jul10	In USD	In AUD	In CAD	In EUR	In JPY	In GBP	In CHF	In INR
MDLOX	-0.73%	-1.37%	-2.52%	8.47%	-8.15%	2.30%	0.47%	-1.01%
PASAX	5.78%	5.13%	3.99%	14.98%	-1.64%	8.80%	6.98%	5.50%

Overview of Our Valuation Methodology

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

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

and Performance Heterogeneity" by Gary and Wood, "Team Mental Models and Team Performance" by Lim and Klein, and "Good Sensemaking is More Important than Information" by Eva Jensen).

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

We also believe that, in addition to careful asset allocation, a disciplined portfolio risk management process is critical to an investor achieving his or her long-term goals. In our view, there are four main elements to this process. The first is a systematic approach to rebalancing a portfolio back to its target weights, either on the basis of time (e.g., yearly) or when one or more asset classes is over or under its target weight by a certain "trigger" amount. The second risk management discipline is the monitoring of asset class prices, in relation to estimates of both fundamental valuation and short-term investor behavior, matched with a willingness to reduce exposure (e.g., by hedging with options or moving into cash or undervalued asset

classes) when overpricing becomes substantial and dangerous to the achievement of long-term goals. We stress that the objective of this process is not market timing in pursuit of higher returns; rather, we view this risk discipline as the willingness to depart from one's normal, long-term (i.e., "policy") asset allocation and rebalancing strategy under exceptional circumstances when crash risk is very high. Of course, this begs the question of when and how should one reinvest in an asset class after a bubble has inevitably burst. Again, we believe that fundamental valuation analysis should be an investor's guide to this third risk management discipline. From a long-term investment perspective, the best time to get back in is when an asset class is undervalued, even though this may be the most psychologically difficult time to do so. As a compromise approach, many investors choose to reinvest over time (i.e., "dollar cost average") to limit potential regret.

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

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

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

Table: Market Implied Regime Expectations and Three Year Return Forecast

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

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

Rolling Three Month Returns in USD		30Jul10
High Uncertainty	**High Inflation**	**Normal Growth**
Short Maturity US Govt Bonds (SHY) **1.07%**	US Real Return Bonds (TIP) **1.22%**	US Equity (VTI) **-7.18%**
1 - 3 Year International Treasury Bonds (ISHG) **2.05%**	Long Commodities (DJP) **-0.69%**	EAFE Equity (EFA) **-4.59%**
Equity Volatility (VIX) **6.58%**	Global Commercial Property (RWO) **-0.94%**	Emerging Equity (EEM) **-1.55%**
Gold (GLD) **0.11%**	Long Maturity Nominal Treasury Bonds (TLT)* **10.10%**	High Yield Bonds (HYG) **1.26%**
Average *2.45%* *Three Months Ago:*	*Average (with TLT short)* *-2.63%* *Three Months Ago:*	*Average* *-3.01%* *Three Months Ago:*
-1.20%	*-0.99%*	*2.67%*

* Falling returns on TLT indicate rising inflation expectations

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

At the request of many readers, we now publish forecasts for real returns on different asset classes in USD. They can be compared to asset class return forecasts regularly produced by GMO, to which many of our readers also subscribe. Given our belief that foresight accuracy is improved by combining the outputs from different

forecasting methodologies, we have taken a different approach from GMO. As we understand it (and their methodology is available on their site), they start with their estimate of current over or undervaluation, and assume that these will return to 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)*
Assumed Regime Probability Over Next 36 Months	*20%*	*50%*	*30%*	
Real Return Bond Yield	*3.5*	*2.5*	*1.5*	*2.4*
Asset Class Premia Over Real Rate (pct)				
Domestic Bonds	1.0	1.0	-3.0	*2.2*
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)*
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*

Regime	Normal Regime	High Uncertainty Regime	High Inflation Regime	*Forecast Annual USD Real Return Over Next Three Years (weighted real return plus premium)*
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 Jul 10**. We believe that asset prices reflect the interaction of three broad forces. The first is fundamental valuation, as reflected in the balance between the expected supply of and demand for returns. The Global Asset Class Valuation Analysis of each month's journal contains an extensive discussion of fundamental valuation issues. One of our core beliefs is that while asset prices are seldom equal to their respective fundamental values (because the system usually operates in disequilibrium), they are, in the medium and long-run strongly drawn towards that attractor.

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

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

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

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

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

The table also shows return momentum for different asset classes over the preceding three months, as well as the 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.

Valuation at 30Jul10	Current Price versus Long-Term Fundamental Valuation Estimate	Rolling 3 Month Return in Local Currency	Rolling 3 Month Return 3 Months Ago
AUD Real Bonds	Neutral	2.32%	0.49%
AUD Bonds	Possibly Overvalued	4.96%	-2.62%
AUD Property	Neutral	-3.64%	4.84%
AUD Equity	Neutral	-5.92%	6.33%
CAD Real Bonds	Neutral	-0.34%	0.82%
CAD Bonds	Possibly Overvalued	3.99%	-1.30%
CAD Property	Possibly Undervalued	5.51%	4.23%
CAD Equity	Likely Overvalued	-3.13%	10.26%
CHF Bonds	Probably Overvalued	3.50%	1.68%
CHF Property	Likely Overvalued	6.61%	6.09%
CHF Equity	Possibly Ovevalued	-5.90%	5.14%

Valuation at 30Jul10	Current Price versus Long-Term Fundamental Valuation Estimate	Rolling 3 Month Return in Local Currency	Rolling 3 Month Return 3 Months Ago
EUR Real Bonds	Neutral	0.45%	2.84%
EUR Bonds	Likely Overvalued	3.56%	1.56%
EUR Prop.	Possibly Undervalued	6.21%	2.36%
EUR Equity	Possibly Undervalued	-1.65%	3.46%
GBP Real Bonds	Possibly Overvalued	-0.39%	2.29%
GBP Bonds	Possibly Overvalued	3.45%	0.98%
GBP Property	Likely Undervalued	-4.75%	5.63%
GBP Equity	Likely Undervalued	-4.41%	9.11%
INR Bonds	Likely Overvalued	1.47%	-3.59%
INR Equity	Probably Overvalued	9.93%	-0.99%
JPY Real Bonds	Neutral	0.00%	0.59%
JPY Bonds	Likely Overvalued	2.20%	0.40%
JPY Property	Likely Undervalued	-6.18%	11.72%
JPY Equity	Likely Overvalued	-15.05%	9.47%
USD Real Bonds	Neutral	1.32%	1.31%
USD Bonds	Likely Overvalued	4.33%	0.53%
USD Property	Neutral	-1.65%	24.44%
USD Equity	Probably Overvalued	-7.14%	12.23%
Following in USD:			
Investment Grade Credit (CIU)	Likely Overvalued	2.87%	1.75%
High Yield Credit (HYG)	Probably Overvalued	1.23%	5.96%
Emerging Mkt Equity (EEM)	Probably Overvalued	-0.97%	9.59%
Commodities Long	Likely Overvalued	-0.69%	4.37%
Gold	Likely Overvalued	0.11%	8.87%
Timber	Likely Undervalued	-5.68%	13.29%
Uncorrelated Alpha	N/A	-0.83%	1.75%
Volatility (VIX)	Likely Undervalued	6.58%	-10.44%
Future Return in Local Currency from holding USD:	*Based on Covered Interest Parity*		
Returns to AUD	Positive	2.95%	-4.60%

Valuation at 30Jul10	Current Price versus Long-Term Fundamental Valuation Estimate	Rolling 3 Month Return in Local Currency	Rolling 3 Month Return 3 Months Ago
Investor			
Returns to CAD Investor	Neutral	1.78%	-5.04%
Returns to EUR Investor	Neutral	1.75%	4.08%
Returns to JPY Investor	Negative	-8.32%	3.77%
Returns to GBP Investor	Positive	-2.08%	4.41%
Returns to CHF Investor	Negative	-2.79%	2.14%
Returns to INR Investor	Positive	4.86%	-4.15%

Investor Herding Risk Analysis

One of our core assumptions is that financial markets function as complex adaptive systems. One of the key features of such systems is their ability to pass through so-called "phase transitions" that materially change their character once certain variables exceed or fall below critical thresholds. In our September 2009 issue, we reviewed a paper on one of critical variables, "Leverage Causes Fat Tails and Clustered Volatility" by Thurner, Farmer and Geanakoplos. This paper more formally demonstrated the importance of a factor that has been associated with booms and busts throughout financial history: the expansion of the supply of credit at a pace well in excess of real economic growth. In the past we have also noted that rising uncertainty tends to increase the size, degree of connectedness and intensity of communications within social networks that influence investor decision making. In turn, this leads to greater coordination of investor behavior, causing not only a higher tendency toward momentum, but also higher fragility, and susceptibility to rapid changes in asset prices (see, for example, "Asset Pricing in Large Information Networks" by Ozsoylev and Walden, or "Dragon Kings, Black Swans, and the Prediction of Crises" by Didier Sornette).

As a practical matter, the challenge for investors has been to identify variables or statistics that can be used to track the strengthening of networks that is often associated with phase transitions. With this in mind, we call readers' attention to an excellent paper by Lisa Borland, of the asset management firm Evnine and Associates in San Francisco ("Statistical Signatures in Times of Panic: Markets as a Self Organizing System"). Using the phase transition approach, Borland searched for statistical signatures of market panics, and proposes a new order parameter that is easy to calculate and appears to capture the changing dynamics of asset return correlations and the underlying social network and herding phenomena that give rise to them. The parameter equals the number of financial markets or assets that have positive returns over a given interval (in 2010 we are switching from YTD to just the past month, as we believe it provides a more accurate assessment), less the number that have negative returns, divided by the total number of financial markets or asset classes evaluated. If the value is zero, the markets are in a disordered state and far from the potential phase change point. However, as the parameter value approaches positive one or negative one, the markets are in an increasingly ordered state – that is, networks are larger and more active, causing increased alignment in collective investor behavior (more commonly known as "herding"). Under these conditions, a market may be close to a phase change point, and therefore subject to a sudden, and potentially violent, shift in its previous trend. We have calculated this order parameter for the 38 financial markets (excluding foreign exchange) we evaluate each month. Here are the results for each of the most recent 12 months:

Aug	Sep	Oct	Nov	Dec09	Jan10	Feb10	Mar10	Apr10	May10	Jun10	Jul10
0.51	0.56	(0.30)	0.72	0.24	(0.03)	0.30	0.46	0.44	(0.28)	0.28	0.35

As you can see, in recent months global financial markets appear to have gone from a highly ordered and fragile state in November, to one that was highly disordered by the end of January and back to a low to moderately ordered state by the end of July. We therefore conclude that at **30 Jul 10**, there was low to moderate risk of a sudden, substantial, and highly correlated change in prices across multiple asset classes.

This Month's Letters to the Editor

Since you once lived in London, here is a question for a summer holiday. If you were having a dinner party with sufficient Pimms, wine and lager to make for interesting conversation about the topics you write about, who are the ten people you would invite to an English dinner party?

Obviously, you have great insight into our character…But I digress. That's a tough question to answer, but I'll have a go: Philip Coggan, Doyne Farmer, Jeremy Grantham, Andrew Haldane, Andrew Lo, James Montier, Russell Taylor, Gillian Tett, Bill White, and Martin Wolf. Likely not a dull moment if this group ever got together – and probably quite a few good solutions to the world's problems.

How should I evaluate your asset class valuation and economic updates?

An interesting question that we can answer in a number of ways. The first is the most obvious: in hindsight, were they accurate, and did they achieve our stated goal of helping our readers to avoid the substantial downside losses that can significantly reduce the probability of achieving a long-term real portfolio return target? We recently read a paper that shows just how hard this is in practice. In "Managerial Miscalibration", Ben-David, Graham, and Harvey "study a unique panel of over 11,600 probability distributions provided by top financial executives, spanning nearly a decade of stock market return expectations." They find that "financial executives are severely miscalibrated: realized market returns are within executives' 80% confidence interval only 33% of the time." Unsurprisingly, the authors also found that miscalibration about future stock market returns was "linked to miscalibration about forecasts for firm-specific project returns." This suggests a second approach to answering your question, evaluating not just whether our results met our goals, but also the process we used to produce those results. As Wheaton and Chido note in their paper on "Evaluating Intelligence", "ultimately, intelligence is an externally focused process

designed to reduce the level of uncertainty for a decision maker" via the production of an estimate (i.e., the intelligence product) using an variety of methodologies. The authors note that "given the probabilistic nature of intelligence products, evaluators of intelligence must look at both the product and the process; the truth is, that product and process cannot be separated."   After reading this paper, we read another by Charles Manski, on "Policy Analysis with Incredible Certitude."   He notes that "analyses of public policy regularly express certitude about the consequences of alternative policy choices. Yet these predictions are often fragile, with conclusions resting not just on data and logic, but also on critical assumptions that are either unsupported or untenable", which undermine the certitude with which the conclusions are stated.   Manski notes that "holding fixed the available data, and presuming avoidance of deductive errors, stronger assumptions yield stronger conclusions. At the extreme, one may achieve certitude by posing sufficiently strong assumptions. The fundamental difficulty of policy analysis is to decide what assumptions to maintain. Given that strong conclusions are desirable, why not maintain strong assumptions? Because there is a tension between the strength of assumptions and their credibility." This leads Manski to assert his "Law of Decreating Credibility" – "The credibility of an inference decreases with the strength of the assumptions maintained…In other words, stronger assumptions yield conclusions that are more powerful but less credible." Manski's critical concern is that "when analysts overreach, they not only give away their own credibility, but they also diminish public trust in science more generally." In our view, the same can be said about investment research. We have long believed that not only must we produce forecasts that enable our subscribers to achieve their long-term real return goals, but we must also do so in a manner that makes our methodologies and their limitations as transparent as possible.   So this is the second basis upon which I would judge our economic and asset class valuation updates, as well as our asset allocation recommendations. On both of these criteria we believe we have performed reasonably well over the past fourteen years. Just as important, we have also worked hard to continuously improve, to highlight the limitations of our knowledge and our conclusions, and to encourage readers to combine them with the

results produced by other methodologies to improve forecast accuracy. In sum, these are the criteria on which we believe our efforts should be judged: Have we helped our subscribers to achieve their long-term real return goals, have we been open about our knowledge and methodologies and their limitations, and have we sought to continuously improve our process?

How did you identify the three regimes you use in your analysis – high inflation, high uncertainty, and normal times?

For each currency zone, we started with a series of nominal returns for different asset classes, along with inflation and changes in exchange rates, covering January 1989 to December 2008. We defined the high inflation and high volatility regimes as those containing about the highest 20% of months for these two metrics (we say about, because if the difference in inflation or volatility between the lowest month in the high regime and the next month was very small, we included more months until the difference was larger, and therefore more significant). Months that were not in a high regime were classified as being in the normal regime.

August 2010 Economic Update: Too Much Leverage and Too Little Demand

Our view is that the world faces four critical and interrelated challenges today, whose potential effects are non-linear. This makes them both hard to understand, and raises the likelihood that we will underestimate their potential impact and will be surprised by the rapid changes they may cause. 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. On the other side of this equation 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), and various levels of government, up to and including some sovereign nations.

The second challenge is the weakened and imbalanced state of global 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, 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 slowed the reduction in aggregate demand in 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 the fundamental assumption that underlies 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."

The third challenge facing the world economy is the risk that developed economies will slip into an extended period of deflation, similar to Japan's experience since the bursting of its property and equity bubble in 1989. This challenge is the subject of this month's feature article.

The final challenge we face is maintaining the legitimacy of various political institutions, both international (e.g. rules governing multilateral trade and capital flows) 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 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 scenario assumes that we will fail to meet one or more of these challenges, and, given their complex interrelationships and non-linear effects, the result will be an extended period of stagnation whose severity will take many people by surprise.

In our assessment of the new evidence that each month presents, we continue to use the "Analysis of Competing Hypotheses" (ACH) methodology, whose essence is the conscious search for information that is credible and has a high diagnostic value (i.e., it has a low probability of occurrence under more than one scenario). In this way, ACH helps to protect us from the confirmation bias – the tendency to attend to, and give greater weight to information that confirms your preferred view, rather than information that contradicts it (see "Forecasting Accuracy and Cognitive Bias in the Analysis of Competing Hypotheses" by Andrew Brasfield).

Let us now turn to a review of recent evidence about the outcome of the first two of the four key challenges facing the world economy. The third, deflation, is the subject of this month's feature article. The fourth, maintenance of political legitimacy, will be the subject of next month's economic update.

Reducing High Leverage

In the U.S., recent news items continue to paint a grim picture on the state of the leverage challenge in the household sector. For example, in the Federal Reserve Bank of New York's most recent Quarterly Report on Household Debt and Credit, they report that at 30 June 2010, "11.4% of outstanding debt was in some stage of delinquency, compared to 11.2% a year ago. Currently about $1.3 trillion of consumer debt (of which about 80% is mortgages and home equity lines of credit) is delinquent, and $986 billion is seriously delinquent (at least 90 days late)."

Data from the housing markets continue to be strongly negative. A new report from Experian and Oliver Wyman found that "nearly one in five mortgage defaults

through the first half of 2009 [note the lag in this data] were strategic, where borrowers who appeared to have the capacity to repay their mortgages stopped doing so...The absolute number of strategic defaults increased 53% over the same period in 2008." ("*Wall Street Journal*, 28Jun10, "Study: Nearly One in Five Mortgage Defaults Are Strategic"). Another article in the *New York Times* concluded that "the housing bust that began among the working class in remote subdivisions and quickly progressed to the suburban middle class is striking the upper class in privileged enclaves...Whether it is their residence, their second home, or a house bought as an investment, the rich have stopped paying the mortgage at a rate that greatly exceeds the rest of the population. More than one in seven homeowners with loans in excess of a million dollars are seriously delinquent...'The rich are different: they are more ruthless' said CoreLogic's senior economist." (*New York Times*, 8Jul10, "Biggest Defaulters on Mortgages are the Rich", by David Streitfeld).

Uncertainty about the extent of bad loans and loan guarantees on the books of Fannie Mae and Freddie Mac in the U.S. continues to rise. This is a critical issue, for, as Gillian Tett noted in the 22Jul10 Financial Times, "the volume of outstanding mortgages backed by these two institutions now stands at $5,500 billion, or about half the U.S. mortgage market." She notes that "guesstimates about the size of the future taxpayer liability [for bad mortgage debt held or guaranteed by the two organizations] now range from $390 billion to almost a trillion dollars." She goes on observe that, "so is there any chance of seeing a proper stress test of this exposure? Or exit strategy? Don't bet on that soon. These days, [Fannie and Freddie] are the only thing keeping the U.S. mortgage and housing sector afloat, because private securitization has effectively collapsed: last year, for example, nine our of ten mortgages were underwritten by Fannie and Freddie."

Elsewhere in the financial system, there is a great deal of cynicism about European bank stress tests that did not include a scenario with sovereign defaults (e.g., by Greece). As European banks have a substantial amount of sovereign debt on their balance sheets, this omission has resulted in far less of an improvement in

investor confidence that regulators had probably hoped for (see, "A Test Cynically Calibrated to Fix the Result" by Wolgang Munchau, *Financial Times*, 25Jul10).

There has also been an upsurge in papers and articles on the subject of sovereign default. In "From Financial Crash to Debt Crisis", Rienhart and Rogoff, examine a long historical time series and conclude that "the evidence confirms a strong link between banking crises and sovereign default across the economic history of a great many countries, advanced and emerging alike...Private debt surges are a recurring antecedent to banking crises...Banking crises often precede or accompany sovereign debt crises...Public borrowing accelerates markedly ahead of a sovereign debt crisis; governments often have 'hidden debts' that far exceed the better documented levels of external debt...During the final stages of the private and public borrowing frenzy on the even of banking and debt crises and (most notoriously) bursts of hyperinflation, the composition of debt shifts distinctly toward short-term maturities." Elsewhere, in the 26May10 *New York Times,* the hedge fund manager David Einhorn writes (in "Easy Money, Hard Truths"), "The question is this: If we don't change direction, how long can we travel down this path without having a crisis? The answer lies in two critical issues. First, how long will the capital markets continue to finance government borrowing that may be refinanced but never repaid on reasonable terms? And second, to what extent can obligations that are not financed through traditional fiscal means be satisfied through central bank monetization of the debts – that is, by printing money?" Einhorn cautions that, "at what level of government debt and future commitments does government default go from being unthinkable to inevitable, and how does our government think about that? ... Modern Keynesianism works great until it doesn't. No one really knows where the line is...I don't believe a United States debt default is inevitable. On the other hand, I don't see the political will to steer the country away from crisis...[Moreover], allowing borrowers, including the government, to get addicted to unsustainably low rates creates enormous solvency risks when rates eventually rise."

On the other side of the pond, in their Global Economics Note on 18Jun2010, Morgan Stanley noted that "For some time now, the Euro has been caught in a vicious

circle where the sovereign debt crisis and the bank funding crisis are mutually reinforcing each other. Sovereign rating downgrades have eroded confidence in the balance sheets of the banks, most of which own government bonds and are guaranteed, directly or indirectly by governments. This, together with higher borrowing costs for fiscally challenged countries, has raised funding costs for banks in the interbank market and in the capital markets. In turn, the banking sector woes raise additional question marks in the markets about sovereign creditworthiness, as more banks may have to be bailed out by governments that already run large fiscal deficits and struggle to limit the rise in public debt."

On 20Jul2010, Michal Pettis posted (on *China Financial Markets*, www.mpettis.com) an excellent article on "Do Sovereign Debt Ratios Matter?" I was struck by how much it resonated with my own experience many years ago in Latin America (experience which, in truth, I never imagined would one day be relevant in the developed world). Pettis argues that "there are at least five important factors in determining the likelihood that a country will suspect or renegotiate certain types of debt. First, of course debt levels, perhaps measured as total debt to GDP, or external debt to exports, matter...Second, the structure of the balance sheet may be much more important than the actual level of debt...Foreign currency and short term borrowings servicing cost declines when confidence and asset prices rise, and rise when confidence and asset prices decline...making the good times better and the bad times worse...Third, the economy's underlying volatility matters...less volatile economies can safely bear more debt...Fourth, the structure of the investor base matters...Contagion is caused not so much by fear, as most people assume, but by large amounts of highly leveraged positions, which force investors into delta hedging...buying when asset prices rise, and selling when they drop...Fifth, the composition of the investor base is also important...A sovereign default is always a political decision, and it is easier to default if the creditors have little domestic political power or influence."

In "Unpleasant Surprises", Bandiera, Cuaresma, and Vincelette of the World Bank uses a model averaging technique to examine sovereign defaults in 46 emerging

market countries between 1980 and 2004. They find that, "in addition to the level of indebtedness, the quality of policies and institutions is the best predictor of default episodes that occurred in countries with relatively low levels of debt. For countries with higher levels of debt (defined as external debt above 50% of GDP), macroeconomic stability, as measured by the rate of inflation, plays a robust role in explaining differences in default probabilities." As we have repeatedly noted in our writing, the authors of this paper also find that combining the results of models that use different methodologies produces the most accurate forecasts.

Elsewhere, Calculated Risk (www.calculatedriskblog.com), has been running an outstanding series on sovereign default. We highly recommend the 18July10 posting on "What Happens if Things Go Really Badly? $15 Trillion of Sovereign Debt in Default."

At the sub-sovereign level, coverage of the municipal financial crisis in the United States is growing more intense and insightful. As our readers know, this crisis has multiple roots, including very large unfunded pension and post-retirement health care obligations to public sector employees, growing social program costs, rising debt costs, and political resistance to higher taxes. Something has to give – the only question in our mind is when it does, and how ugly it will be. *City Journal's* Steve Malanga has been writing about this issue for years, and his latest article ("The Muni Debt Time Bomb" in the Summer 2010 issue) is characteristically insightful, as is Joel Kotkin's examination of the political roots of the crisis in California, in the same issue ("The Golden State's War on Itself: How politicians turned the California Dream Into a Nightmare"). We strongly recommend it. Elsewhere, in the *New York Times*, Roger Lowenstein writes about "The Next Crisis: Public Pension Funds" and highlights their extreme underfunding. Perhaps the biggest bombshell in the unfolding muni crisis landed rather quietly recently (perhaps this is just the calm before the storm) when Professors Robert Novy-Marx and Jonathan Rauh published their latest analysis of public pension fund deficits. In "Policy Options for State Pension Systems and Their Impact on Plan Liabilities", the authors paint a very grim picture of what lies ahead. After evaluating the impact of the "public pension reform" measures undertaken thus

far in different municipalities, and assuming they were adopted everywhere else, the authors conclude that taxpayers likely will be asked to bear the cost of the approximately $1 trillion in unfunded liabilities that remain after the proposed "reforms." To put it bluntly, this is further confirmation that problems in the municipal debt market are sure to get ugly, and will eventually pit taxpayers, public sector unions, social program supporters and bondholders against each other. Finally, just as the fight is about to heat up, the SEC appears to be taking long-overdue notice of the problems in the U.S. municipal debt market, and has recently launched an enforcement action against the state of New Jersey, alleging fraud in its bond disclosure documents (see "Pension Fraud in New Jersey Puts Focus on Illinois", by Mary Williams Walsh, *New York Times*, 20Aug10). We have no doubt that the SEC's efforts will soon spread to other states, adding further fuel to the fire that is building in this sector of the global fixed income market.

The final work on the growing sovereign debt crisis, and the paper vying for the title of "biggest bombshell" this month, is a recent research report by Arnaud Mares of Morgan Stanley. In "Ask Not Whether Governments Will Default, But How", he points out that, fiscally, the emperor has no clothes. His argument starts with the familiar point that debt/GDP ratios are misleading, because they omit liabilities for future social security and retiree health care benefits. To this he adds the equally important point that debt/GDP ratios are also deceiving because "whatever the size of a government's liabilities, what matters ultimately is how they compare to the resources available to service them. One benefit of sovereignty is that governments can unilaterally increase their income by raising taxes, but they will only ever be able to acquire in this way a fraction of GDP. Therefore, debt/GDP provides a flattering image of government finances. A better approach is to scale debt against actual government revenues. An even better approach would be to scale debt against the maximum level of revenues that governments can realistically obtain using their tax raising power to the full. This is a function of the people's tolerance for taxation and government interference." Mares then uses this framework to make his emperor has no clothes point: If the present value of maximum future tax revenues is less than the present value of future

government liabilities, the government is insolvent, and "some or all of its stakeholders must suffer a loss: either taxpayers (through a higher tax burden), or beneficiaries of public services (through lower government expenditures) or bondholders (through some form of default)." Observing that today it appears that many governments are, using this framework, insolvent, Mares concludes that "it is not whether to default, but how and vis-à-vis whom. What this means is that governments will impose a loss on some of their stakeholders. The question is not whether they will renege on their promises, but rather upon which of their promises they will renege and what form this default will take. From the perspective of sovereign debt holders, this translates into two questions: (1) Does their claim on governments rank senior enough on other claims to fully shelter them from losses? And (2), If it does not, what form will their loss take?" Noting that bondholders have thus far avoided losses, Mares asks "can this realistically continue forever?" He concludes that "whether bondholders will be asked to share the pain depends on (1) the intensity of the conflict that opposed them to other stakeholders, which today is likely stronger than it has ever been; and (2) the extent to which the interest of bondholders are aligned with those of the most political influential constituencies." Regarding the latter, Mares concludes that the interests of bondholders are not well aligned with the interests of the most politically powerful consitutency. "The constituency of the elderly is the biggest competitor to bondholders because of the considerable size of its direct claims on future government revenues, their reluctance to relinquish these claims, and the reduced share of outstanding government bonds that they hold today, particularly relative to foreign investors."

The ongoing problems in some segments of the corporate debt market are also drawing more coverage. For example, PIMCO recently published a research note titled "Distressed Debt: The End is NOT Near." They note that "even if a company is successful in accessing the high yield market, they are generally refinancing low-cost bank loans with rates of less than 4% with new bonds costing 10% or more." Judging from very high new issue volume, particularly in the high yield market, in recent weeks, there is clearly a market for this debt, among, we would guess, fixed income investors who are "stretching for yield", and probably not adequately pricing the additional

default risk they are taking on. As PIMCO concludes, "we view the unprecedentedly quick recovery of corporate credit spreads from historic highs to long-run averages as unsupported by fundamental economic improvements."

As we have noted in previous issues, leverage problems are not confined to the developing world. As many writers have noted, there is increasing evidence that a very substantial property bubble has been building in China, fed by that country's aggressive credit growth after the 2008 crisis. A new research paper provides further evidence against the "strong growth in China" story that underlies the muddling through scenario. In "Evaluating Conditions in Major Chinese Housing Markets", Wu, Gyourko and Deng conclude that "housing markets look very risky based on the stylized facts we document. Price-to-rent ratios in Beijing and seven other large markets across the country have increased from 30% to 70% since the beginning of 2007. Current price-to-rent ratios imply very low user costs of no more than 2% to 3% of house value. Very high expected capital gains appear necessary to justify such low user cost of owning…That people might believe in such high appreciation is not incredible given the recent history of Chinese house prices. However, this sort of backward looking expectation formation is a classic element of bubble psychology… Our calculations suggest that even modest declines in expected appreciation would lead to large price declines of over 40% in markets such as Beijing, absent offsetting rent increases or other countervailing factors. Price-to-income ratios also are at their highest levels ever in Beijing and select other markets…Real constant quality land values have increased by nearly 800% since the first quarter of 2003, with half that rise occurring over the past two years…The magnitude of the increase in land values over the past 2-3 years in particular in Beijing is unprecedented to our knowledge. Not only do these increases post-date the Summer Olympics, but the recent price surges in early 2010 suggest a relationship to the Chinese stimulus package which itself is temporary…[Moreover], state-owned enterprises controlled by the central government have played an important role in this increase, as our analysis shows they paid 27% more than other bidders for an otherwise equivalent land parcel…The role of state-owned enterprises is potentially worrisome. It could be that these entities are superior

investors and are purchasing sites that are of especially high quality in ways that we cannot control for in our empirical analysis.   However, it also could be that moral hazard is at work here, as these entities are thought to have access to low cost capital from state-owned banks and may believe that they are 'too big to fail.'   If this is the driving force, then prices are being bid up as one arm of the government buys from another."   In our experience, academic research doesn't get more damning than this report.

Growing and Rebalancing Global Demand

Following on our review of recent developments on the leverage front, we'll begin our discussion of global demand with a new paper from the IMF. In "Public Debt and Growth", Kumar and Woo explore the impact of high public debt on economic growth. They find that "the empirical results suggest an inverse relationship between initial debt and subsequent growth, controlling for other determinants of growth. On average, a 10 percentage point increase in the initial debt/GDP ratio is associated with a decrease in real per capita GDP growth of around 0.2% per year, with the impact being somewhat smaller in the more advanced countries. There is also some evidence of non-linearity, with higher levels of initial debt having a proportionately larger negative effect on subsequent growth. Analysis of the components of growth suggests that the adverse effect largely reflects a slowdown in labor productivity growth, mainly due to reduced investment and slower growth of the capital stock."

Another recent look at economic history also finds that the historical precedents are not encouraging when it comes to a quick return to health rates of aggregate demand.   In "After the Fall" Carmen and Vincent Reinhart examine "the behavior of real GDP, unemployment, inflation, bank credit, and real estate prices in a twenty one year window surrounding selected adverse global and country specific shocks and events." They find that "real per capita GDP growth rates are significantly lower during the decade following severe financial crises…The median post-financial crisis GDP growth decline in advanced economies is about one percent…In the ten

year window following severe financial crises, unemployment rates are significantly higher than in the decade that preceded the crisis…Over an eleven year period (encompassing the crisis year and the decade that followed), about 90 percent of the observations show real house prices below their level the year before the crisis…In the decade prior to a crisis, domestic credit/GDP climbs about 38 percent, and external indebtedness soars. Credit/GDP declines by an amount comparable to the surge after the crisis. However, deleveraging is often delayed and is a lengthy process lasting about seven years."

Now let's move on to the most recent OECD Economic Outlook, which was released late in June. It provides a succinct summary of the baseline or "muddling through" scenario, and highlights the optimistic assumptions that underlie it. "For OECD countries, the starting position (in 2011) is far from macroeconomic equilibrium, with large output gaps and fiscal balances which in many countries are far away from levels that would be consistent with stable government debt. Given the size and combination of these two imbalances, and the wish to consider scenarios in which debt levels are brought back to pre-crisis levels the time horizon of the baseline scenario has been extended (to 2025) compared with previous OECD baseline exercises. Most of the assumptions underlying the scenario tend to err on the optimistic side, including that: the crisis itself has no permanent adverse effect on the rate of growth of total factor productivity or potential output; output gaps are closed by 2015 as a result of sustained above-trend growth with output growing in line with potential thereafter; most countries do not experience deflation despite continued negative output gaps over this period, and eventually experience a smooth return to targeted inflation by 2015; and countries are assumed to address the budget implications of ageing and trend health cost increases through compensatory or offsetting budget saving…The scenario builds in a reduction in the level of potential output due to the crisis so that compared to OECD medium-term projections made prior to the crisis (e.g. OECD, 2008), the level of area-wide potential output is lowered by about 3%, with most of this reduction already having taken place by 2011. From 2012 onwards, the growth rate of OECD-wide potential output recovers to average

about 1.9 per cent per annum, but this is still below the average growth rate of 2.3 per cent per annum achieved over the seven years preceding the crisis…Unemployment is falling in all countries, with the area-wide unemployment rate down from 8.50 per cent in 2010 to a rate of 6.25 per cent by 2015 and 53/4 per cent in 2025…"

"As a stylised assumption, a degree of future fiscal consolidation has been incorporated in the baseline scenario which is sufficient to stabilise the ratio of government debt to GDP over the medium term. However, the relatively modest pace of this consolidation (1/2 per cent of GDP per annum reduction in the underlying primary balance for as long as it takes to stabilise debt) is such that in most cases there is a further build-up in the government debt to GDP ratio before it does stabilize. The slow pace of consolidation and the high levels of debt reached may in practice not be sustainable but these assumptions are chosen to have a basis against which to explore more ambitious consolidation strategies. It should also be kept in mind that the assumption understates the extent of required reforms as additional pressures on public spending from ageing populations are already assumed to be met by compensatory or offsetting budgetary savings…OECD general government net and gross debt is projected to increase by about 30% of GDP by 2011 relative to pre-crisis levels and, under the assumptions set out above, by about a further 20 percentage points of GDP before it stabilises thereafter. The number of OECD countries with gross debt levels that exceed 100% of GDP would rise from three prior to the crisis to eleven by the next decade…Current-account imbalances declined sharply during the crisis."

"A part of this current account improvement is likely to persist, as asset price bubbles that were fuelling the deficits in the United States and in several European countries have burst, translating into higher savings rates and/or lower investment rates in those countries, and as measures are being taken to prevent their reappearance. Fiscal consolidation in the large current-account-deficit countries, to the extent it exceeds that in the surplus countries, should also help limit the increase in global imbalances, at least in the short run. Another part of the recent narrowing of imbalances, however, was of a temporary nature and has already started to reverse.

This reversal reflects the rebound in commodity prices and also the recovery in demand in large-deficit countries. The further unwinding of cyclical effects is also likely to lead to some increase in global imbalances. In particular, as all economies return to full capacity both the US trade deficit and the Chinese trade surplus are likely to increase. Thus, as the recovery continues and output gaps close, and in the absence of changes to policies that affect international imbalances, global current-account imbalances are set to continue to rise…On this basis, the baseline scenario foresees a widening of the US current-account deficit to about 4% of GDP by 2015 followed by a subsequent stabilisation, while the Chinese surplus as a percent of GDP would rise from about 4.0% in 2015 to about 5.50% in 2025. A recovery in oil and commodity prices would also bring about a rise in the current account surpluses of the main net oil-exporting countries. The net effect of the unwinding of cyclical factors and the effect of ageing populations imply a surplus in Japan of around 2-3% of GDP going into the next decade. The current-account balance of the euro area would stabilise at about 1% of GDP, although much bigger imbalances would remain within the area."

"In summary, under the baseline scenario of mild fiscal consolidation and otherwise unchanged policies, no significant rebalancing of growth should be expected and the overall scale of global external imbalances would edge slightly higher over the medium term albeit remaining below immediate pre-crisis levels…The baseline scenario implies the emergence of major imbalances which could sow the seeds of a future crisis…The risks of a disorderly unwinding of global current-account imbalances, including abrupt changes in exchange rates, would thus persist… Although, by construction, government debt-to-GDP ratios are assumed to stabilise as a result of gradual consolidation measures, for many countries it is at greatly increased levels which is likely to imply higher long-term interest rates and dampen medium-term growth prospects. It will also leave many countries in a difficult position to cope with future shocks and the rising fiscal costs of ageing (which are not explicitly considered in the baseline)."

Is there a better alternative to muddling through that could produce a better outcome? In OECD's view, there is, but it would require "fiscal consolidation in OECD

countries, exchange-rate realignments and structural reforms in most regions of the world. The recovery in those OECD countries where fiscal consolidation needs are greatest would be delayed (relative to the baseline scenario) because of the lags before structural reforms and exchange rate changes take effect, but GDP growth would remain positive in all major countries and continue to strengthen beyond 2012 so that output would catch up and exceed the baseline scenario after five years…Over the longer term, general government debt in most OECD countries would return to pre-crisis levels and measures of global current-account imbalances would be reduced relative to current levels. The flipside of the delayed recovery is that growth would be more sustainable over the longer run, whereas sustainability in the baseline scenario is highly questionable given the build-up in government debt and international imbalances."

But what are the chances that we will see the "fiscal consolidation in OECD countries, exchange-rate realignments and structural reforms in most regions of the world" that the OECD believes are required to put global demand back on a sustainable path? On the fiscal consolidation front, there is great debate over whether moves in this direction in the short-term are advisable, given the lack of any pickup in consumer spending (due to high unemployment and the uncertainty it causes, not to mention overleveraged balance sheets and falling home values) or in business investment (again, due to high uncertainty about future demand conditions and government policies). That leaves improved export growth as the remaining source of demand that, should it increase, would allow some reduction in government deficits. But it is a truism that, absent a sharp increase in import demand on Mars or some other planet, it is impossible for every nation on Earth to increase export growth at once. Yet there is no shortage today of countries that are pursuing exactly that strategy. Unfortunately, the most likely candidates for increasing imports seem, for a variety of reasons, to be opposed to going down that path. For example, Germany seems to prefer its traditional focus on exports as a driver of demand growth, instead of undertaking policy changes to stimulate domestic consumption (which German citizens, with their aversion to debt, might successfully resist) or higher levels of

government deficit spending (which Germans might see as leading to higher taxes that, in effect, would force them to pay for the bailout of nations they see as less responsible than themselves).

But what about China, then? To begin with, rising tensions between China and the West on a number of fronts are unlikely to be accompanied by greater Chinese desire to help those same nations out of their current economic predicament (e.g., China's increasingly strong attempts to assert sovereignty over the South China Sea, its development of an antiship ballistic missile intended to limit the ability of the United States to use aircraft carriers to project force in Asia, and growing frustration among western businesses at the difficulty of doing business in China – see, for example, "Global Economy: Trading Blows" in the 5Jul10 *Financial Times*). Yet that still leaves the question of whether domestic political demands could force the Chinese government to implement policies that would benefit the West.

To be sure, there are some glimmers of hope along these lines. For example, it is clear that a faction of the Chinese government recognizes that the economic crisis in China's traditional export markets means that, if social and political stability are to be preserved, China must transition to growth led by domestic consumption rather than exports and the investment spending needed to continuously increase them. Another example is the recent announcement that the Chinese government is exploring options to enable farmers to use their rights to use land (which they do not own) as collateral for obtaining loans. Economic history teaches us that this step can be an extremely powerful means of increasing agricultural productivity and income growth. Yet it also teaches that if there are not sufficient jobs in other sectors to absorb displaced agricultural workers, the results of this policy can be socially and politically destabilizing. And here is where the omens from China today are not good.

As Andy Xie writes ("China's Foul Assets, Fouler Yet", *Caijing*, 13May2010), "powerful interest groups have paralyzed China's macro policy, with ominous long-term consequences. Local governments consider high land prices their lifeline…[They] depend on the property sector for revenue as profits from [export] manufacturing decline and the need to spend [to meet growth targets and preserve social peace]

increases…State-owned enterprises don't want interest rates to rise, as preferential lending treatment has led to their rapid expansion… Exporters are suffering from rising costs and weak global demand. They are vehemently against currency appreciation. [China's leaders] have travelled the path of least immediate resistance – monetary expansion and asset inflation…China's asset bubble has probably grown more quickly than any in the past…China's macro policies have been reduced to psychotherapy, relying on sound bites and small technical moves to scare speculators. In the meantime, inflation continues to pick up momentum."

Elsewhere, Michael Pettis (www.mpettis.com) has repeatedly shown why raising interest rates to slow the bubble economy is so difficult in China. Essentially, oppressing savers (and thus household consumption) by holding down rates is critical to the other players in the system, including banks (who need large funding gaps to offset the large number of bad loans they hold), state-owned enterprises (who need subsidized borrowing rates to offset the cost of maintaining overly high staffing levels to preserve political stability), exporters (for whom low borrowing costs helps to maintain competitive pricing in the face of slight exchange rate appreciation and intense price competition in their target markets) and state and local governments (which, as previously noted, have become critically dependent on property speculation for their revenues).

Pettis has further argued that, in addition to financial repression, holding wage growth below labor productivity growth has also been critical to Chinese competitiveness in export markets, which in turn drove job creation in those industries. With the effects of the one child policy now beginning to bite (in the form of a tightening supply of trained workers, and rising wage demands), minimizing exchange rate appreciation and continuing to hold down interest rates have become even more important to the maintenance of Chinese growth, and, in turn, social and political stability. Given these constraints on policy changes that would increase Chinese household consumption demand, Pettis concludes that "the world seems to be marching inexorably towards trade war" as "the U.S. will be forced to choose between either protection or soaring trade deficits and rising unemployment" ("The Last Chance

to Avoid Trade War", *Financial Times*, 22Aug10).

Finally, there is the theory (hope might be a better word) that emerging markets besides China can provide the demand for increased exports from the West. Yet many of these countries have been pursuing the same export oriented, mercantilist strategy that China has, and appear to be just as unwilling to change their policies. There is also a more subtle problem at work. Were emerging market nations to suddenly switch from running current account surpluses to running substantial current account deficits (because of higher imports of goods and services exported by the developed nations of the West), the necessary counterpart would be surpluses on their capital account. These surpluses would be composed of a mix of increased foreign direct investment, loans from foreign banks, and issuance of equity and bonds by local companies to foreign investors. As we have noted in the past, there are serious questions as to whether the institutional structures in these nations (e.g., laws governing property, contract, and bankruptcy law, minority shareholder rights, disclosure, insider trading, etc.) are sufficiently robust to give foreign investors the degree of confidence needed to warrant a level of investment far greater than anything that has occurred in the past. Based on many years of experience in these markets, we believe that in most cases, they cannot meet this standard. It is one thing to allocate 10% of a portfolio to emerging markets. It is an altogether different thing to raise that allocation to 25% or 33%.

An excellent recent paper by Barry Bosworth and Susan Collins ("Rebalancing the US Economy in a Post-Crisis World", published by the Asian Development Bank Institute) evaluated the options facing the United States today, using the private-public-external balance framework that we have used for years in our analyses. They focus on "future challenges to external rebalancing from both the domestic and external perspective." They begin by noting that "for most of the past three decades, a growing trade deficit has been associated with a buoyant domestic economy, rapid job growth, and a decline in unemployment to unprecedented levels. This domestic strength suggests that the trade deficit was not something forced onto the United States economy by outside pressures, but rather a response to changing domestic

economic conditions that pushed aggregate demand beyond the nation's productive capacity…The data show rising private consumption as the counterpart to a growing trade deficit." The authors then move on to a more specific examination of the determinants of America's external deficit. Historically, they show how U.S. imports have been relatively insensitive to changes in relative prices (i.e., exchange rates and relative inflation rates), and how U.S. imports have been "considerably more sensitive to changes in U.S. income than are U.S. exports to changes in the income of U.S. trading partners." However, Bosworth and Collins also show how all of these conditions appear to have improved over the past decade. However, they also highlight "a gradual secular decline in U.S. exports relative to imports in recent years, after controlling for changes in relative prices and incomes, as well as changes in the composition of U.S. exports and imports." They conclude that the most likely explanation of this finding is the relatively higher "willingness of American multinational firms to use the local production of foreign affiliates to serve foreign markets, as an alternative to exporting from the U.S." In the 22Aug10 *Caijing*, Xie echos this view, noting that "we are seeing the interplay between the forces of globalization and policy mistakes. Globalization has severely restricted the effectiveness of economic stimulus. The value of tade plus FDI are half of global GDP. Trade is visible in terms of stimulus leakage. But, where investment occurs in response to demand growth is far more important. [In a world of free trade and integrated global supply chains], multinationals can invest anywhere in the world in response to demand…Essentially, demand is local but supply is global…This cuts the linkage between demand stimulus and investment response. The latter is crucial to employment growth, which is necessary for sustaining demand growth [when the stimulus is reduced or withdrawn]."

Bosworth and Collins also note that, "exports, like private saving, are difficult to influence through available policy instruments, especially in the short-run." Looking at options for reducing domestic and external imbalances, Bosworth and Collins are pessimistic: "We conclude that additional fiscal stimulus, if unaccompanied by comparable fiscal stimulus by U.S. trading partners, would speed the recovery from the recession and promote job growth, but at the cost of an even larger budget deficit,

a large deterioration in the trade deficit, and increased reliance on foreign financing. The result is financially unsustainable, and no simple means of correcting the future imbalances is evident…The absence of a clear path for the United States to escape the recession and emerge with a balanced economy is a cause for great concern."

With respect to the global rebalancing challenge, Martin Wolf accurately summed up our view of the current situation in the title of a recent column: "This Global Game of Pass the Parcel Cannot End Well" (*Financial Times,* 29June10).

There are also substantial domestic challenges to aggregate demand growth in most developed countries today. Briefly, the household sector is still burdened by historically high debt levels, falling residential property values, and fears of higher unemployment. While spending by the highest income groups appeared to have picked up earlier this year (the top five percent of households by income account for about 33% of U.S. private consumption spending), this has recently turned down (see "Wealthy Reduce Buying in Blow to the Recovery", *Wall Street Journal*, 16Jul10). Private sector investment is held back by uncertainty regarding future demand growth, by lack of credit (particularly for bank dependent small businesses), and in some cases (most notably the U.S.) by high uncertainty about future changes to government taxes and regulations (for an interesting research paper on this, see "Do Powerful Politicians Cause Corporate Downsizing?" by Cohen, Coval and Malloy). Finally, continued deficit spending by governments is increasingly constrained by rising concern over mounting levels of debt.

As some commentators have noted, while there has been considerable use of monetary and fiscal tools to stimulate the U.S. economy, to some extent these policies may have been based on faulty diagnosis of the underlying problem. PIMCO's Mohamed El-Eiran noted recently ("*Why Another Fiscal Stimulus Won't Do*", Washington Post, 27Aug10), "what is critical to keep in mind is that this situation is part of a broad, multi-year process driven by national and global realignments. It's a secular phenomenon that needs to be better understood and navigated, by recognizing its structural dimensions and by urgently broadening the excessively cyclical policy mindsets that abound. Unfortunately, the approach in too many

industrial countries has been to kick the can down the road, seemingly hoping for a series of immaculate economic recoveries. Policymakers must break this active inertia by implementing a structural vision to accompany their current cyclical focus." This is a point we also have frequently made in our writing, focusing on the need for structural reform in critical areas like public education, small business finance, energy policy, social safety net programs, health care, financial sector reform, and reducing household debt burdens. However, El-Erian is not optimistic that we will see an increased focus on structural rather than cyclical policies: "To my dismay, the prospects for a sufficiently bold policy reaction are doubtful…The politics of structural change are an impediment to recovery…An already polarized political environment is becoming even more fractured by far less substantive issues. There is virtually no political center that can anchor consensus and enable sustained implementation of policy." Sadly (and we write this having once worked in a Washington where the center ruled), we have to agree with El-Erian on this critical point, and with his final conclusion that "this worrisome trio of increasingly ineffective national and global policy stances, intense political polarization, and growing social pressures speaks to the risk that the economy's recent soft patch will evolve into something even more troublesome and sinister."

Next Month: Assessing the Risks to Political Legitimacy

Feature Article: The Risk of Deflation and Its Impact on Asset Class Returns

We first wrote about deflation and liquidity traps back in May 2001. For the past few years, one of our scenarios has included a period of deflation, followed by the return of high inflation. Our fundamental view has been that three powerful deflationary forces would ultimately prove too strong to resist – the entry of an export-oriented China into the world economy, the displacement of jobs by increasingly sophisticated technology, and the inexorable rise of aggregate debt/GDP ratios in developed economies. Today, you can't pick up an investment periodical without reading about

competing and contradictory forecasts that either deflation or higher inflation are just around the corner. Over the past fourteen years, we have learned that when your views become mainstream, it is time to re-examine them. For that reason, this month we will take a closer look at deflation, including what it is, what causes it, why it is dangerous, the chances that the United States will soon enter a period of deflation, and its potential impact on asset class returns. We will try to do this as succinctly as possible. We realize that many of you will be reading this at the beach, or somewhere else on holiday.

So what is deflation? As a practical matter, the term refers to a sustained decline in a broad price index, like the Consumer Price Index in the United States. In this sense, it is the opposite of inflation. Finally, it is not to be confused with "disinflation", which is the term used to define a reduction in the rate of inflation over time. Of course, the definition of deflation as a sustained decline in a broad price index raises the question of just what that price index contains, and how it is calculated. Inescapably, this is a highly sensitive political issue for most governments, as higher inflation not only has a significant impact on consumer and market sentiment, but, all else being equal, also results in lower reported real GDP growth, which tends to further reinforce the negative sentiment impact of high inflation. Put differently, from a political perspective, there is a systematic prejudice in favor of methodologies that result in lower reported consumer price inflation and higher reported real GDP growth.

Historically, the purpose of a broad consumer price index was to track the change in prices for a constant mix of goods and services purchased by the "average" consumer, in order to track changes in the real standard of living. For example, an annual rise of 10% in the consumer price index that was accompanied by only a 7% nominal increase in personal income would imply a decline in the real (after inflation) standard of living. As you would guess, the calculations behind the consumer price index have always been a source of controversy. For example, there have been arguments over the right way to adjust the mix of goods and services, the right way to take into account changes in the quality of goods over time (e.g., even if a computer

still costs the same in 2010 as it did in 2000, the quality of that computer has dramatically increased), and the right way to calculate the index itself (e.g., seasonal adjustment, geometric versus arithmetic weighting, etc.). An excellent discussion of these controversies can be found on shadowstats.com (where they also show how the use of a consistent methodology over time would produce a higher rate of inflation than the one reported today by the U.S. Bureau of Labor Statistics).

The following table shows the (rounded) weights used today to calculate the U.S. Consumer Price Index for All Urban Consumers:

Food and Beverages	15%
Shelter	32%
Household Furnishings and Operations	5%
Apparel	4%
Transportation (ex-fuel for private vehicles)	12%
Energy (household and motor fuel)	9%
Medical Care	7%
Recreation	6%
Education	3%
Communication (including information technology)	3%
Other Goods and Services	4%
	100%

This brings us to our second question: What causes deflation? Macroeconomists typically cite two causes. The first is a persistent output gap – that is, levels of aggregate demand and supply that are significantly below the total capacity of an economy to supply goods and services. This could result from a sudden fall in aggregate demand (as we have experienced over the past decade, due to technology eliminating a growing number of jobs, or the sharp fall we have seen in the aftermath of the 2008 global financial crisis), or from a sudden increase in aggregate supply (as has arguably occurred in some sectors in recent years following the emergence of China as a major player in the global economy). In the output gap perspective, the theoretical owner of a factory with excess capacity will cut prices in order to generate higher sales volume and enough revenue to cover costs.

The second cause of deflation cited by macroeconomists is a monetary one. In theory, the nominal value of aggregate economic output equals the volume of output ("Q") times its average price ("P"). By definition, this must also equal the value of the supply of available money ("M", which can be measured in different ways), times its so-called "velocity" ("V", which equals P x Q/M). This produces the well known monetarist relationship: PQ=MV, and the belief that by managing the growth of the money supply, deflation can be avoided. Yet central bankers also know that changes in "V" can thwart their plans, as it tends to decrease as people and businesses become more uncertain, and desire to spend less and hold larger cash balances. For example, in the United States, the velocity of M2 (one measure of the money supply) fell from 2.08 in the first quarter of 2008 to just 1.70 by the first quarter of 2010. Less obvious, but just as dangerous, is the impact of weakness in the banking system on central bankers' ability to expand "M". As we see today, while the Federal Reserve is aggressively adding reserves to the banking system, rather than expanding credit (a component of the broad money supply), most banks are simply choosing to earn interest on their holding surplus reserve balances with the Federal Reserve. Last but not least, the events leading up to the global financial crisis of 2008 highlights how excessive money supply growth does not necessarily imply an increase in the prices of goods and services. Rather than "classic" consumer price index inflation, in a world of free and rapid capital flows, excessive money supply growth can just as easily result in asset price inflation (which is further stimulated by human beings tendency to herd when they see their neighbors apparently getting rich). For example, we saw this in U.S. residential property, and we may be seeing it again in Chinese residential property. Unfortunately, when credit fueled asset price bubbles collapse, they often trigger banking crises, which impair money supply growth and in turn can trigger deflation.

More recently, a third macroeconomic theory of deflation has emerged. In "The Perils of Taylor Rules", Benhabib, Schmitt-Grohe and Uribe begin with the so-called "Taylor Rule", which is a feedback approach to inflation control that is believed to be used as a policy guide by many central banks. Specifically, when the rate of inflation

is above its target range, a Taylor Rule "responds to increases in inflation with a more than one-for-one increase in the nominal interest rate" [note that the nominal rate of interest includes both the real rate and the market's expectations for future inflation]. It has been widely believed that the use of Taylor Rules contributes to macroeconomic stability. However, the authors observe that "the nominal interest rate must be constrained to be non-negative, since negative nominal interest rates are impossible. It immediately follows from this observation that if there is a steady state with an active monetary policy [governed by a Taylor Rule], there must necessarily exist another steady state with a passive monetary policy, in which the nominal interest rate is near zero and inflation is possibly negative." In other words, the authors conclude that it is possible for an economy to become trapped in an equilibrium state with a low but persistent rate of deflation. In "Expectations, Deflation Traps, and Macroeconomic Policy", Evans and Honkapohja begin with their assumption that "the evolution of expectations plays a key role in the dynamics of the economy." They then show how "unstable deflationary paths can arise after large pessimistic shocks to expectations." The underlying mechanism is "a self-reinforcing feedback loop, in which sufficiently pessimistic expectations result in low output and deflation, leading to high real interest rates because of the zero lower bound on nominal interest rates, which results in a downward revision of expectations, strengthening the downward pressure on output and deflation."

At the microeconomic level, the table above hints at a more complicated set of causes for deflation. First, different dynamics may be underway in different sectors of the economy. For example, in recent years shelter prices were driven by a debt fuelled bubble, and now reflect the forces at work in the aftermath of that bubble's spectacular collapse. In contrast, energy prices reflect a completely different mix of factors, including global political uncertainty (in the case of oil), new technology developments (which have sharply increased supplies of natural gas, forcing down its price), and regulatory changes (e.g., changes in environmental rules that affect the cost of gasoline and the mix of fuels used to generate electricity). In the medical care and education sectors (and arguably some parts of financial services), still other forces are

at work. In both areas, suppliers of the services in question face very steep demand curves, and hence for years have been able to raise their prices at rates far above the rates of price change in other sectors of the economy. In contrast, unpredictable changes in the weather can have a significant impact on food prices. Finally, globalization and export-led growth strategies in China and other Asian countries have undoubtedly contributed to excess capacity in other sectors, such as apparel, household furnishings, information technology, motor vehicles, video and audio equipment, and sporting goods.

The second important point highlighted by the table is that different sectoral dynamics have an unequal impact on changes in the overall level of the Consumer Price Index, and hence on reported (i.e., headline) inflation and deflation. As you can see, changes in the price of shelter, food and beverages, transportation and energy account for 68% of the index, with the price of shelter alone having a 32% impact.

Today, there is a general consensus that deflation is more dangerous than inflation. A recent paper published by the Bank of England ("Deflation" by Groth and Westaway) succinctly sums up deflation's costs. The first cost is the postponement of consumption. "If prices are expected to fall, consumers will defer purchases until goods are cheaper, amplifying any slowdown in aggregate demand." However, the authors also note that "while superficially convincing, this argument is flawed, at least in its simplest form. That is because the timing of purchases by consumers will be determined not only by their inherent preference for consuming now rather than later, but importantly also by the real rate of interest that they face – i.e., the nominal interest rate adjusted for expected inflation [or deflation]. For a given nominal interest rate, if inflation turns negative [i.e., if deflation occurs], this will raise real interest rates and cause consumers to postpone spending; they will prefer to earn a higher real interest rate on their savings and spend later. For real rates to fall to encourage consumers to spend more in the present, nominal interest rates would have to be cut by more than the fall in inflation. But as inflation falls towards zero and then below, it becomes more likely that nominal interest rates will hit the zero bound. This means that the

consumption postponement cost associated with deflation is simply part of the wider issue of the costs associated with hitting the zero interest rate bound."

The second set of costs associated with deflation are caused by nominal wage rigidities. As the Bank of England authors note, "it may be difficult for businesses to reduce money wages when economic conditions warrant such falls, either because the conditions facing the firm are very depressed or because the aggregate price index is falling." In this case, employers who are unable to reduce wages would instead have to reduce employment. Hence, another cost of deflation may be a higher level of unemployment. In another paper, ("Understanding the Costs of Deflation in the Japanese Context"), Taimur Baig from the IMF presents evidence that in Japan, resistance to nominal wage cuts in line with deflation has resulted in lower corporate profits and higher levels of unemployment.

Perhaps the most feared cost imposed by deflation was first described by Irving Fisher in 1932. As most debt contracts are written in nominal terms, deflation increases the real interest rate borrowers must pay. As the Bank of England authors note, "if the deflationary episode has been caused by an adverse shock to demand, this is likely to be associated with falling output and higher unemployment, making the [higher real] debt burden even more difficult to service. Furthermore, these economic circumstances are often also associated with a sharp fall in asset values. And if this degrades the value of the collateral securing a loan, it could magnify the effect of the initial shock, as firms and households become more likely to default on their debts. [In turn] this can cause financial institutions to cut back on their lending to rebuild their balance sheets."

The last set of costs imposed by deflation are those associated with the zero bound on nominal interest rates, which significantly reduces the effectiveness of traditional monetary policy. Closely related to this is the heightened uncertainty that would undoubtedly accompany deflation, as multiple players across the economy struggled to make sense of a set of relationships and dynamics that most of them have never seen before. This would significantly increase the difficulty of making forecasts to guide government monetary, fiscal and structural policy.

However, it is also important to note that not all deflationary episodes are alike. In another paper ("Deflation in a Historical Perspective" by Bordo and Filardo of the Bank for International Settlements), the authors begin by noting that "the relative frequency of deflationary episodes in history is striking. In many countries deflation was just as common as inflation during the 19th and early 20th centuries. In contrast, the incidence of deflation during the past 50 years has been relatively rare." They then go on to distinguish between what they term "good, bad, and ugly" periods of deflation. The authors note that "in history, deflation has often coincided with robust economic growth. This is in sharp contrast to the conventional wisdom that generally is drawn from a more limited focus on deflation in Japan in the 1990s and deflation episodes in the Great Depression." For example, they note that "the 1873-1896 episode was a 'good deflation' when prices fell in many countries by about 2% per year, accompanied by real growth of about 2% to 3% per year. Deflation in this era was driven by both a productivity boom (reflecting the second industrial or mechanical revolution) and the proliferation of railroads across the world." However, the authors also caution that "although secular deflation was accompanied by positive growth, it was controversial because of its distributional consequences. Groups whose real incomes fell, such as debtors and farmers, complained bitterly and engaged in often disruptive social and political agitation. In the United States, this was manifested in the free silver movement and the rise of organized labor. In Europe, it appeared in both the growth of labor unions and labor political parties, and in a demand for tariff protection by agricultural groups." Another episode of "good" deflation was 1921 – 1929, which was characterized by "rapid real growth in most countries, and a mild deflation of 1% to 2%."

In contrast to 1873-1896, 1837-1843 was an example of a bad deflation. "This episode began with financial crises in London and Continental Europe, and especially the United States in 1837. Another wave of crises occurred in 1839." This era saw relatively low rates of GDP growth in the United States and France, and a fall in GDP growth in the United Kingdom. Poor output performance leads the authors to characterize this period as an example of "bad" deflation. A similar episode occurred

between 1919 and 1921, when economic activity contracted following the end of World War One, due to tight monetary policies intended to counteract the high inflation that characterized the later war years. The authors also classify deflation in Japan in recent years as a bad deflation, with "stagnant real activity along with mild deflation."

The authors cite 1929 – 1933 as an example of an "ugly" deflation, which was characterized by drastic declines in output, rising real interest rates, debt deflation, and high unemployment. Finally, the authors of the BIS paper examine different factors which distinguished good deflation episodes from those that were bad and ugly. Their key conclusion is that the presence of a banking crisis very substantially increases the probability of a bad or ugly episode: "History has shown that banking problems that translate into impediments to monetary policy can lead to bad deflation. And, of course, if banking problems develop into a full blown banking crisis, a bad deflation can turn into an ugly deflation." Other variables were much less significant, though logical in the direction of their impact. For example, supply shocks were most often associated with episodes of good deflation, while demand shocks were associated with both bad and ugly deflations. They also conclude that "asset price booms and busts many be a much more important source of persistent deflation than conventional supply and demand shocks."

What then, are the chances that we will enter a period of deflation in the United States? To begin with, there is no shortage of commentators today who are warning of upcoming deflation in the United States. Perhaps the most widely noted of these warnings was a recent paper ("Seven Faces of the Peril") by James Bullard, President of the Federal Reserve Bank of St. Louis. Bullard draws heavily on the previously noted paper by Benhabib, Schmitt-Growhe and Uribe, and concludes that the alternative steady state they predict would be accompanied by average deflation of about 50 basis points per year. Bullard notes that recent annual Japanese deflation rates have all been within 100 basis points of this equilibrium level.

Bullard's main concern is that the Federal Reserve Open Market Committee's "pledge to keep the policy rate near zero for an extended period of time is consistent with the low nominal interest rate steady state in which inflation does not return to [the

Fed's] target, but instead both actual and expected inflation turn negative and remain there" as Bullard concludes has been the case in Japan. Bullard also concludes that non-traditional monetary policy (i.e., policy aimed at expanding the money supply, or "quantitative easing" rather than traditional interest rate targeting) has the best chance of avoiding a slip into the deflationary steady state. He noted that "the quantitative easing program, to the extent that it involves buying longer-dated government debt, has often been described as 'monetizing the debt.' This is widely considered to be inflationary, and so inflation expectations are sensitive to such purchases. In the U.K., all the purchases [thus far] have been gilts [Treasury debt]. In the U.S. most of the purchases were of agency – Fannie Mae and Freddie Mac – mortgage backed securities, newly issued in 2009. It has been harder to judge the inflationary effects of these purchases, and so perhaps the effects on inflation expectations and hence actual inflation have been somewhat less reliable in the U.S. than the U.K....For the U.K., in particular, both expected inflation and actual inflation have remained higher to date, and for that reason the U.K. seems less threatened by a deflationary trap."

Bullard also notes another important factor that contributes to the ability of quantitative easing to avoid the deflationary steady state: "the extent to which such purchases are seen by the private sector to be temporary or permanent...In the Japanese quantitative easing programs, beginning in 2001, the Bank of Japan was unable to gain credibility for the idea that they were prepared to leave the balance sheet expansion in place until policy [inflation] objectives were met. And in the end, the BOJ in fact did withdraw the program without having successfully pushed inflation and inflation expectations higher, validating the private sector's expectation." In sum, Bullard concludes that "the U.S. economy is susceptible to negative shocks which may dampen inflation expectations. This could possibly push the economy into an unintended, low nominal interest rate steady state. Escape from such an outcome is problematic. Of course, we can hope that we do not encounter such shocks and that further recovery turns out to be robust – but hope is not a strategy. The U.S. is closer to a Japanese style outcome today than at any time in recent history."

In contrast to Bullard, in "Expectations, Deflation Traps and Monetary Policy", Evans and Honkapohja question the effectiveness of monetary easing, and conclude that "for sufficiently pessimistic expectations" the economy can remain stuck in the deflationary steady state. Avoiding it requires not only aggressive monetary policy, but also aggressive fiscal policy: "By stabilizing prices through expansionary government spending, low nominal interest rates yield low expected real interest rates, which leads to a recovery in private spending." However, their model notably does not take into account the fact that a recovery in private spending may also be constrained by factors other than uncertainty, particularly very high levels of leverage and/or a financial system crisis that limit access to credit.

Last but not least, two other papers raise the possibility that policy errors, made out of apparent political necessity, could tip the United States into an extended period of deflation. In "The Rising Threat of Deflation", John Makin of the American Enterprise Institute notes that "many market participants and policymakers have warned that aggressive monetary easing will lead to inflation", and that "fears of higher inflation are a persistent phenomenon at central banks after accommodative steps have been taken to cushion the negative impact of a financial crisis on the real economy." On the fiscal policy front, Makin notes the increasing concern with rising government debt/GDP ratios, and worries about countries' ability to continue rolling over their outstanding debt and/or having to pay much higher rates for it due to rising worries about higher future inflation. In turn, this has led to pressure for reductions in the size of fiscal deficits. Makin concludes that "at this point, fiscal rectitude and monetary stringency are a dangerous policy combination, as appealing as they may be to the virtuous instincts of policy makers faced with a surfeit of sovereign debt."

Similarly, in a 2002 paper ("Fears of Deflation and Policy Responses Now and Then"), Burdekin and Siklos emphasize that "it is quite clearly the case that bad policy choices, not deflation per se, are the culprit in explaining virtually every slump that is associated with deflation. If the negative connotations associated with deflation mask poor policy choices, then one may well ask what led to poor decision making." The authors note that the challenge of accurately perceiving the situation and the

consequences of possible actions is one source of policy errors. They also note that another cause of such errors is "when policy makers are held hostage to some ideology and cannot escape the disastrous consequences of carrying out policies consistent with the ideology in question, even when a different prescription is clearly necessary." In recent months, the *Financial Times'* Martin Wolf has repeatedly made this same point.

Our view is that there is now better than a 50% chance that the United States will slip into the alternative steady state of persistent low deflation, with a similar probability that once we have entered a deflationary period, it could turn into an "ugly" episode. We start from the observation that there is little evidence that the multiple leverage problems we face are easing. Indeed, the evidence points to worsening problems in many areas, from household debt and the residential property market, to commercial real estate debt to financial system debt to municipal and sovereign debt. For example, in the Federal Reserve Bank of New York's most recent Quarterly Report on Household Debt and Credit, they report that at 30 June 2010, "11.4% of outstanding debt was in some stage of delinquency, compared to 11.2% a year ago. Currently about $1.3 trillion of consumer debt (of which about 80% is mortgages and home equity lines of credit) is delinquent, and $986 billion is seriously delinquent (at least 90 days late). While total delinquent balances are now down 2.9% from a year ago, serious delinquencies are up 3.1%." These data suggest that the U.S. housing crisis is far from over, and that we will see further downward pressure on the shelter costs that account for 32% of the U.S. CPI-U index. Moreover, as noted above, the presence of banking and financial system crises very substantially increases the probability that an "ugly" deflation episode will occur.

On top of this, there are growing worries about conditions in China, with an increasing suspicion that the popping of the Chinese property bubble will cause a significant reduction in Chinese growth. In turn, this will put significant downward pressure on metals, energy and some agricultural commodity prices. It will also worsen the already severe gap between actual and potential output (i.e., capacity underutilization) around the world, which will put further downward pressure on prices.

We also note that weakening economic and banking system conditions around the world, from Europe to China to Japan, will likely lead to an increased demand for U.S. Treasury securities, which should lead to further appreciation of the U.S. dollar, which will put further downward pressure on U.S. prices (as a stronger U.S. dollar makes imports cheaper). Finally, we believe that, due to political pressures in the United States (not to mention pressures from the bond market, which, in aggregate, should logically prefer deflation to inflation), the probability of policy errors that will sharply increase the risk of deflation – e.g., premature reductions in fiscal and monetary stimulus measures – is very high (see, for example, James Montier's recent piece on "Is Austerity the Road to Ruin?"). In so far as there is any good news in this story, it is this: both theory and the available evidence from Japan over the past 20 years suggest that, should we enter a period of deflation, it is not likely to accelerate, and instead will more likely remain at relatively low levels, as policy makers struggle to find a way out of the deflation trap.

What then are the likely affects of an extended period of deflation on the real returns on different broad asset classes? Our current assessments are summed up in the following table:

Asset Class	Impact of Deflation on Real Returns
Real Return Government Bonds	• Lowers real return, since these bonds are primarily inflation hedges. However, some RRBs, such as U.S. TIPS, guarantee that at least 100% of principal will be repaid. That means that these bonds would earn a real return equal to the rate of deflation, since the real purchasing power of the bond principle would be growing at that rate.
Nominal Government Bonds	• Uncertainty and low growth associated with inflation should increase demand for safe assets like government bonds. Rising bond prices will depress yields. Real return will be equal to nominal yield plus rate of deflation.
Nominal Credit Bonds	• Strong credit risks should see rising bond prices, as investors seek to earn nominal yields that are higher than those available on nominal government bonds. However, weaker credit

Asset Class	Impact of Deflation on Real Returns
	risks may see falling bond prices (and rising yields) due to increasing perception of default risks in a slow growth economy with flat to negative corporate revenue growth and increasing real debt burdens (since the real interest rate paid by corporates on their debt will be equal to the nominal rate plus the rate of deflation).
Commercial Property	• On balance, deflation will probably have a negative impact on commercial property, due to flat to falling rents and low demand for space in a low growth economy. That said, premier properties with solid tenants and favorable lease terms that offer yields comparable to highly rated corporates could see rising prices. Put differently, deflation could lead to widening return differentials between different segments of the commercial property market.
Commodities	• Deflation and low growth should depress returns on industrial metals. To the extent that demand for agricultural commodities is driven by changing diets and economic growth (e.g., cattle) they could be negatively affected by an extended period of low growth. On the other hand, agricultural commodities that are staples (e.g., grains) will likely have lower correlations with other commodities, with returns that continue to be affected by weather. That said, since most commodities are priced in USD, increases in the USD exchange rate versus other currencies could have a negative impact on agricultural commodity demand and hence returns. With respect to energy, oil returns should suffer due to weak economic growth and demand for transportation which is the main use for oil. In contrast, about 67% of natural gas is used for electricity generation, and heating, where demand is less linked to economic activity. Given this, structures (e.g., master limited partnerships) that convert natural gas production into a predictable income stream (i.e., into an attractive yield), should be quite attractive in a deflationary environment.

Asset Class	Impact of Deflation on Real Returns
Timber	• Weak economic growth will depress construction and furniture demand, and therefore put downward pressure on timber prices. On the other hand, deflation will have no impact on timber growth (the other main source of timber returns). Hence, real timber returns should still be attractive, particularly as a source of portfolio diversification.
Equity	• In general, deflation should result in slower growth and rising real debt service costs, which will depress corporate earnings growth and equity returns. Also, deflation will increase the real discount rate at which future dividends are discounted, which will have a further negative impact on equity prices. An exception to this generally negative outlook may be equities with stable cash flows and dividends – e.g., the highest quality consumer staples and some utilities. Finally, we do not believe that in a period of deflation affecting the United States, Europe and Japan that emerging markets would be able to successfully "delink" from developed markets and offer superior returns. It seems far more likely that they will be dragged down by deflationary conditions in developed markets.
Volatility	• The recent history of Japan suggests that a prolonged period of deflation will be characterized by higher uncertainty, including a number of attempted breakouts from the stable deflation regime. This should result in higher volatility, and higher returns to investors who are long volatility.
Uncorrelated Alpha Strategies	• Strategies that are truly equity market neutral should be unaffected by deflation. On the other hand, equity long/short strategies with a long bias should be negatively affected. The best global macro managers should do well, though there will inevitably be a difficult period during which managers learn to play by a different set of rules that will characterize a period of prolonged deflation. For this reason, quantitative strategies, including currency carry strategies, could be wrong-footed by deflation,

Asset Class	Impact of Deflation on Real Returns
	which will change many of the underlying relationships and assumptions upon which they are based.

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 (Current Dividend Yield x 100) x (1+ Forecast Productivity Growth) divided by (Current Yield on Real Return Bonds + Equity Risk Premium - Forecast Productivity Growth). Our valuation estimates are shown in the following tables, where a value greater than 100% implies overvaluation, and less than 100% implies undervaluation. In our view, the greater the number of scenarios that point to overvaluation or undervaluation, the greater the probability that is likely to be the case.

Equity Market Valuation Analysis at 30 Jul 10

Australia	Low Demanded Return	High Demanded Return
High Supplied Return	70%	103%
Low Supplied Return	105%	143%

Canada	Low Demanded Return	High Demanded Return
High Supplied Return	68%	121%
Low Supplied Return	127%	191%

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Eurozone	Low Demanded Return	High Demanded Return
High Supplied Return	47%	84%
Low Supplied Return	83%	126%

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Japan	Low Demanded Return	High Demanded Return
High Supplied Return	73%	129%
Low Supplied Return	138%	209%

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United Kingdom	Low Demanded Return	High Demanded Return
High Supplied Return	33%	71%
Low Supplied Return	68%	113%

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United States	Low Demanded Return	High Demanded Return
High Supplied Return	70%	132%
Low Supplied Return	142%	220%

Switzerland	Low Demanded Return	High Demanded Return
High Supplied Return	56%	98%
Low Supplied Return	99%	234%

India	Low Demanded Return	High Demanded Return
High Supplied Return	60%	151%
Low Supplied Return	177%	311%

Emerging Markets	Low Demanded Return	High Demanded Return
High Supplied Return	80%	171%
Low Supplied Return	122%	213%

In our view, the key point to keep in mind with respect to equity market valuations is the level of the current dividend yield (or, more broadly, the yield of dividends and buybacks), which history has shown to be the key driver of long-term real equity returns in most markets. The rise in uncertainty that accompanied the 2007-2008

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

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

Real Return Bonds

Let us now move on to a closer look at the current level of real interest rates. In keeping with our basic approach, we will start by looking at the theoretical basis for determining the rate of return an investor should demand in exchange for making a one-year risk free investment. The so-called Ramsey equation tells us that this should

be a function of a number of variables. The first is our "time preference", or the rate at which we trade-off a unit of consumption in the future for one today, assuming no growth in the amount of goods and services produced by the economy. The correct value for this parameter is the subject of much debate. For example, this lies at the heart of the debate over how much we should be willing to spend today to limit the worst effects of climate change in the future. In our analysis, we assume the long-term average time preference rate is two percent per year.

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

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 Jul 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	1.4	-1.3	114
Eurozone	2.9	1.4	-1.5	116
Japan	2.8	1.4	-1.4	114
United Kingdom	2.8	0.8	-2.1	123
United States	2.5	1.2	-1.3	113

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

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

Government Bond Markets

Our government bond market valuation update is based on the same supply and demand methodology we use for our equity market valuation update. In this case,

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

Bond Market Analysis as of 30 Jul 10

	Current Real Rate*	Average Inflation Premium (89-03)	Required Nominal Return	Nominal Return Supplied (10 year Govt)	Yield Gap	Asset Class Over or (Under) Valuation based on 10 year zero	Implied Annual Inflation Rate over 10 year time horizon = $(1+\text{Nom})/(1+\text{Real})-1$
Australia	2.64%	2.96%	5.60%	5.20%	-0.40%	**3.84%**	2.50%
Canada	1.45%	2.40%	3.85%	3.11%	-0.74%	**7.36%**	1.64%
Eurozone	1.44%	2.37%	3.81%	2.66%	-1.15%	**11.75%**	1.21%
Japan	1.43%	0.77%	2.20%	1.07%	-1.13%	**11.74%**	-0.35%
UK	0.77%	3.17%	3.94%	3.32%	-0.62%	**6.18%**	2.53%
USA	1.23%	2.93%	4.16%	2.91%	-1.25%	**12.78%**	1.66%
Switz.	1.49%	2.03%	3.52%	1.48%	-2.04%	**22.03%**	-0.01%
India	1.49%	7.57%	9.06%	7.82%	-1.24%	**12.08%**	6.24%

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

It is important to note some important limitations of this analysis. Our bond market analysis uses historical inflation as an estimate of expected future inflation over the long-term. This may not produce an accurate valuation estimate, if the historical average level of inflation is not a good predictor of future average inflation levels. This

risk is especially acute today, when the world economy is operating in unchartered waters, and faces both deflationary pressures (from falling demand relative to productive capacity, and significant debt servicing problems in the private sector) and inflationary pressures (from unprecedented peacetime government deficits, that are largely being financed by central banks under the "quantitative easing" programs). Under these circumstances, one could argue that many nominal return government bonds might in fact be underpriced today, over a shorter time horizon (more likely to experience deflation), while overpriced over a longer time horizon (that is more likely to see higher levels of inflation). As we like to point out, in the absence of public policy interventions, overindebtedness on the part of private borrowers typically results in widespread bankruptcies and deflation caused by the accelerating liquidation of collateral.   In contrast, overindebtedness on the part of governments more often results in some combination of inflation and exchange rate depreciation (e.g., look at the history of Argentina, which we know all too well).

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

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

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

Assuming inflation levels revert to their long-term averages over a long time horizon, many government bond markets appear overpriced today (i.e., prevailing nominal yields appear to be too low). However, over a short-term time horizon, it may well be the case that many countries will first experience declining prices (deflation) before 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 Jul 10**, the AAA minus 10 year Treasury spread was 1.79%. The AAA minus BAA spread was 1.15%. Since the distributions of AAA and BAA credit spreads are not normal (i.e., they do not have a "bell curve" shape), w need to look at history rather than Gaussian (normal curve) statistics to put them into perspective. Over the past twenty-four years, 12.9% of all trading days had a higher AAA-Treasury spread. Over the same period, 23.6% of all trading days had a higher AAA-BBB spread.

Over a longer-term time horizon, when liquidity and credit risk premiums would be expected to return to their historical averages, one can argue that credit is underpriced today, given high prevailing yields. However, the validity of that conclusion also critically depends on one's assumptions about future default rates and loss rates conditional upon default. A decision to buy 50,000 in bonds at what appears to be a very attractive yield from a long-term perspective can still generate negative total returns if the future default rate (and losses conditional upon default) more than wipes out the apparently attractive extra yield. And since the differences between current AAA and BBB spreads and their long-term averages (1.24% and .98%, respectively) are well under 100 basis points today, it doesn't take much mis-estimation of future default rates (and losses conditional on default) to turn today's

apparently good decision into tomorrow's painful outcome.   And the "historically attractive yields" argument gets (non-linearly) less convincing the further down the credit ratings ladder you go.   On balance, we think that even on a long-term view, credit likely overpriced today, given the increasingly uncertain economic outlook and difficulty in accurately estimating future default and loss given default rates.

Currencies

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 Jul 10

	To AUD	To CAD	To EUR	To JPY	To GBP	To USD	To CHF	To INR
From								
AUD	0.00%	-2.09%	-2.54%	-4.13%	-1.88%	-2.29%	-3.72%	2.62%
CAD	2.09%	0.00%	-0.45%	-2.04%	0.21%	-0.20%	-1.63%	4.71%
EUR	2.54%	0.45%	0.00%	-1.59%	0.66%	0.25%	-1.18%	5.16%
JPY	4.13%	2.04%	1.59%	0.00%	2.25%	1.84%	0.41%	6.75%
GBP	1.88%	-0.21%	-0.66%	-2.25%	0.00%	-0.41%	-1.84%	4.50%
USD	2.29%	0.20%	-0.25%	-1.84%	0.41%	0.00%	-1.43%	4.91%
CHF	3.72%	1.63%	1.18%	-0.41%	1.84%	1.43%	0.00%	6.34%
INR	-2.62%	-4.71%	-5.16%	-6.75%	-4.50%	-4.91%	-6.34%	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 Jul 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	5.9%	0.2%	6.1%	2.6%	3.0%	5.6%	93%
Canada	4.9%	0.2%	5.1%	1.4%	3.0%	4.4%	86%
Eurozone	5.6%	0.2%	5.8%	1.4%	3.0%	4.4%	75%
Japan	8.0%	0.2%	8.2%	1.4%	3.0%	4.4%	53%
Switzerland*	3.3%	0.2%	3.5%	1.5%	3.0%	4.5%	130%
U.K.	4.9%	0.2%	5.1%	0.8%	3.0%	3.8%	73%
U.S.A.	4.2%	0.2%	4.4%	1.2%	3.0%	4.2%	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 weaken support for property prices, we also recognize that, at least in some markets, they can be offset by property's historical attraction as a means of preserving wealth in very difficult times. In sum, we believe that the sharp run up in property security prices in recent months is due to some combination of investor over-optimism about the speed and size of economic recovery, and/or the tendency of institutional investors to herd rather than risk losing assets (or their jobs) due to their underperforming an asset class benchmark. Switzerland and the Eurozone may be exceptions to this view, in that rising uncertainty may have triggered rising demand for property in these markets.

Commodities

Let us now turn to the Dow Jones AIG Commodity Index (now known as the DJ UBS Commodity Index), our preferred benchmark for this asset class because of the roughly equal weights it gives to energy, metals and agricultural products. One of our

core assumptions is that financial markets function as a complex adaptive system which, while attracted to equilibrium (which generates mean reversion) are seldom in it. To put it differently, we believe that investors' expectations for the returns an asset class is expected to supply in the future are rarely equal to the returns a rational long-term investor should logically demand. Hence, rather than being exceptions, varying degrees of over and under pricing are simply a financial fact of life. We express the demand for returns from an asset class as the current yield on real return government 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 Jul 10**:

Commodity	DJAIG Weight	Current Status
Crude Oil	13.8%	Contango
Natural Gas	11.9%	Contango
Gold	7.9%	Backwardated
Soybeans	7.6%	Backwardated
Copper	7.3%	Contango
Aluminum	7.0%	Contango
Corn	5.7%	Contango

Commodity	DJAIG Weight	Current Status
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 Jul 10** was 0.22%, compared to .54%. one month previously, .74% two months ago, and 1.14% 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, we believe that returns on many commodity futures are more likely to be negative over the next year than positive; hence, using this analytical framework we conclude that commodities are likely overpriced today, using a one-year time horizon.

Another approach to assessing the valuation of commodities as an asset class is to compare the current value of the DJAIG Index to its long-term average. Between 1991 and 2008, the inflation adjusted (i.e., real) DJAIG had an average value of 91.61, with a standard deviation of 16.0 (skewness of .52, and kurtosis of -.13 – i.e., it was close to normal). The inflation adjusted **30 Jul 10** closing value of 84.20 was an estimated .43 standard deviations below the long term average. Assuming the value of the index is normally distributed around its historical average (which in this case is approximately correct), a value within one standard deviation of the average should occur about 67% of the time, and a value within two standard deviations 95% of the time. Whether the current level of the inflation adjusted DJAIG signifies that commodities are undervalued depends upon the time horizon being used.

There are three arguments that, on a medium term (three to five year) view, commodities are underpriced today. The first is the large amount of monetary easing underway in the world, which, at some point, could lead to higher inflation. The second is the equally large amount of fiscal stimulus being applied to the global economy, with its focus on infrastructure projects, should eventually boost demand for commodities (and indirectly boost economic growth in commodity exporting countries like Australia and Canada). The third is that the possibility that we will see a substantial fall in the value of the US Dollar versus other currencies, causing investors to increase their holdings of commodities as confidence in fiat currencies wanes. The argument that commodities are overpricerd today on a medium term view is based on the belief that (a) investment in clean fuels and other changes in environmental regulation will cause a permanent reduction in global demand for oil relative to supply; (b) the inability to quickly resolve the economic challenges facing the world economy will result in a prolonged period of weak or no growth (including a major slowdown in Chinese growth), which will reduce the demand for commodities; and (c) that in scenario of prolonged global stagnation, investors will prefer to increase their holdings of short term government bonds, and perhaps gold, rather than increasing their holdings of a broader range of commodities. Taking all of these arguments into consideration, the medium term valuation question comes down to the probabilities one attaches to a decline in global demand from today's relatively weak levels (which would cause commodities prices to fall) and the development of a crisis of confidence in the U.S. dollar (which would cause commodities prices to rise). On balance, we believe that the former is more likely than the latter, as the High Uncertainty Regime typically sees a flight into U.S. dollars rather than a flow out of them. On that basis, we conclude that, over a three to five year time horizon, commodities are likely overpriced today.

Gold

Gold is extremely difficult to value, because it produces no explicit current income stream (i.e., yield). It price seems to be driven by a combination of worries

about future inflation, and, more powerfully, from uncertainty about the ability of U.S. government securities to provide a stable, liquid store of value in highly uncertain periods. Since investor concerns in both of these areas seem to be increasing, gold prices have been increasing.

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

A third, and more quantitative, approach to assessing gold prices was described at length in our January 2010 article on gold as a separate asset class. Under the normal regime, when the yield on U.S. real return bonds is lower than approximately 2.35%, there tends to be upward pressure on the price of gold; when the yield on U.S. real return bonds is above this level, gold seems to experience downward price pressure. At the end of **July**, the yield on a 10-year USD real return bond was about 1.23%, which implies further upward pressure on gold prices. However, when financial markets are in the high uncertainty or high inflation regime, the risk premium investors demand to hold gold switches from negative (reflecting its role as portfolio insurance under normal conditions) to positive (reflecting the expected positive payoff of that insurance when other returns on other asset classes turn negative). The offset to this on the supply side are increases in the real price of gold above the 1.75% expected in normal time. Under these conditions, the gold market can operate far from equilibrium under the influence of investor herding that drives the supply of returns well above the level of returns investors should logically demand in exchange for holding gold during the high uncertainty and high inflation regimes. Hence, while under these regimes gains on gold can offset losses on other asset classes, so too will the gold market have a tendency to become increasingly fragile and unstable, and crash probabilities increase.

Today, all of the latter factors seem to be at work, and the recent pause in the accelerating upward climb in gold prices further reinforces the impression that the gold market may indeed be in a very fragile state. Conditions in the gold futures market may provide some indication of what lies ahead. Over the past month, gold futures have become slightly backwardated, with a forward premium (based on the price difference between the two nearest month contracts) of only (.02%). We view this as further evidence of the gold market's fragile state. While further negative surprises that raise perceived uncertainty could yet drive gold prices higher (the most powerful of which would be increased worries about the creditworthiness of U.S. Treasury securities), we conclude that at present gold is likely overvalued.

Timber

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

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

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

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

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

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

certain number of trees are harvested each year, and sold to provide revenue to the timber REIT. A third aspect of the physical process is that trees are exposed to certain risks, such as fire, drought, or disease (e.g., the mountain pine beetle in the northwest United States and Canada).   And fourth physical process is that, through 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 CO_2 sequestration value of timberland, see "Economic Valuation of Forest Ecosystem Services" by Chiabai, Travisi, Ding, Markandya and Nunes. For a review of similar studies, see "Estimates of Carbon Mitigation Potential from Agricultural and Forestry Activities" by the U.S. Congressional Research Service).

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

Growth Driver	Assumption
Biological growth of trees	We assume 6% as the long term average for a diversified timberland portfolio. We stress that biological growth rates can vary widely for different types of timber investment (with softwoods and timber located in tropical countries delivering the highest growth, and hardwoods and timber in more temperate climates delivering the slowest growth rates). We have also changed our valuation model to assume a constant mix of product grades, to present a better approximation for timber as a global asset class.

Growth Driver	Assumption
Harvesting rate	As a long term average, we assume that 5% of tree volume is harvested each year. As a practical matter, this should vary with timber prices and the REITs prevailing dividend level. So 5% is a "noisy" long-term estimate for timber as a global asset class.
Change in prices of timber products	In line with IMF data, we assume that over the long term, average timber prices will just keep pace with inflation. Again, this is a "noisy" estimate, because the IMF data also shows that real prices are highly volatile. Moreover, there are indications that climate change is causing increasing tree deaths in some areas, which should lead to future real price increases (see "Western U.S. Forests Suffer Death by Degrees" by E. Pennisi, *Science*, 23Jan09). Hence we believe our long-term price change assumption is conservative.
Carbon credits	Until more comprehensive regulations are enacted, we assume no additional return to timberland owners from the CO_2 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 CO_2 levels, we believe this is a conservative assumption.

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

investing in liquid timberland assets. Arguably, because a portion of timber's return generating process (physical growth) has zero correlation with the return generating processes for other asset classes, we should use an even lower risk premium. Again, we believe our approach is conservative in this regard. Given these assumptions, our assessment of the valuation of the timber asset class at **30 Jul 10** is shown in the following table. We use the dividend discount model approach to produce our estimate of whether timber is over, under, or fairly valued today. The specific formula is (Current Dividend Yield x 100) x (1+ Forecast Dividend Growth) divided by (Current Yield on Real Return Bonds + Timber Risk Premium - Forecast Dividend Growth). A value greater than 100% implies overvaluation, and less than 100% implies undervaluation.

Average Dividend Yield (70% PCL + 30% RYN)	4.30%
Plus Long Term Annual Biological Growth	6.00%
Less Percent of Physical Timber Stock Harvested Each Year	(5.00%)
Plus Long Term Real Annual Price Change	0.00%
Plus Other Sources of Annual Value Increase (e.g., Carbon Credits)	0.00%
Equals Average Annual Real Return Supplied	**5.30%**
Real Bond Yield	1.23%
Plus Risk Premium for Timber	3.00%
Equals Average Annual Real Return Demanded	**4.23%**
Ratio of Returns Demanded/Returns Supplied Equals Valuation Ratio (less than 100% implies undervaluation)	**74%**

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

that physical harvesting rates will increase to cover costs and dividends, then you could argue that, in so far as PCL and RYN are roughly accurate proxies for the asset class as a whole, timber, as 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 CO_2 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 CO_2 sequestration is likely to be significant; (2) the negative impact on timber prices caused by the recession and long-term slowdown in North American housing construction will be moderated or offset by the impact of supply side changes, such as the mountain pine beetle problem, and by rising demand for wood products that will accompany rising incomes in China. On a one-year view, however, we are neutral, with downward timber price risk (due to continuing economic weakness) balanced against the upside potential inherent in pending environmental legislation.

Volatility

Our approach to assessing the current value of equity market volatility (as measured by the VIX index, which tracks the level of S&P 500 Index volatility implied by the current pricing of put and call options on this index) is similar to our approach to commodities. Between January 2, 1990 and December 31, 2009, the average daily value of the VIX Index was 20.29 (median 18.77), with a standard deviation of 8.36 (skewness 2.05, kurtosis 7.28 – i.e., a very "non-normal" distribution). On **30 Jul 10**, the VIX closed at 23.50. 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,

volatility had fallen to 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 Jul 10*			
Economy	Bottoming	Strengthening	Peaking	Weakening
Interest Rates	Falling	Bottom	Rising	Peak
Style and Size Rotation	Small Growth (DSG) **-8.33%**	Small Value (DSV) **-9.05%**	Large Value (ELV) **-6.08%**	Large Growth (ELG) **-7.47%**
Sector Rotation	Cyclicals (RXI) **-6.24%**	Industrials (EXI) **-5.49%**	Staples (KXI) **-0.31%**	Utilities (JXI) **-0.58%**
Bond Market Rotation	Higher Risk (HYG) **1.26%**	Short Maturity (SHY) **1.07%**	Low Risk (TIP) **1.22%**	Long Maturity (TLT) **10.10%**

Product and Strategy Notes

<u>New Product Developments</u>

From many directions come signs of progress toward the eventual listing of interesting new tail risk management products. The Chicago Board Options Exchange recently announced that it is developing a new market skew index, based on the skew implied by the pricing of S&P 500 Index options. As the CBOE notes in its announcement, "historically, investors have purchased out-of-the-money puts to hedge their equity positions, and sold out-of-the-money calls for premium income. If market participants expect a crisis, they would be more likely to buy put protection, which, all things being equal, would contribute to the increase in the skew [implied by option prices. Statistically, skewness refers to the "tiltedness" of a distribution of possible outcomes, compared to the symmetrical distribution that characterizes the normal "bell curve" distribution]. Market participants could therefore take long positions in the skew index to hedge against future expectations of a tail risk event. Those who feel expectations of a crisis are overplayed could decide to short the index." CBOE also said that its analysis shows that the skew index has no correlation with market volatility. Elsewhere, we have previously written about Citibank's development of a market liquidity index (termed CLX), which one day may be used as the basis for products that enable investors to hedge their exposure to illiquidity risk (which was central to the rapid escalation of the 2008 crisis). Overall, we are enthusiastic about the creation of more investable tail risk hedging products that should rise in value when extreme events occur. Products based on skew and liquidity will be valuable additions to tail risk hedging products that are already available today, including short term treasury funds, volatility products, gold products and currency products (e.g., Swiss Franc ETFs).

On the uncorrelated alpha front, in the UK JP Morgan has launched a new UCITS fund that will invest in 20 separate underlying absolute return strategies, that cover four basic styles: momentum, carry (long high yielding assets and short low yielding assets), mean reversion, and selling volatility (i.e., selling insurance). Another

wrinkle in the product is a targeted maximum annual volatility level of 10%, which is to be achieved by dynamically varying fund allocations in accordance with current and forecast market conditions. We have mixed feelings about this product. On the one hand, we strongly support the proposition that giving investors better access to liquid, reasonably priced uncorrelated alpha strategies can raise the probability of achieving long term portfolio return goals. On the other hand, however, we are highly suspicious of bundled products that promise (for higher fees, of course) to achieve something above and beyond what an investor could achieve by herself simply by investing in a number of separate uncorrelated alpha funds. Too often, bundled funds fall short of their intended goals, for the very simple reason that achieving them requires more things to go right (e.g., forecasting, minimizing the cost of more frequent trading, etc.) than have to go right in order to achieve the goals of a simpler strategy. As in so many other areas of life, there is an advantage in KISS – keep it simple, stupid.

Interesting New Research for Advisers and Investors

- In "Confirmation Bias, Overconfidence, and Investment Performance: Evidence from Stock Message Boards", Park, Konana, Gu, Kumar, and Raghunathan analyze South Korean data to test their "conjecture that investors would use message boards to seek information that confirms their prior belief" and that "this confirmation bias would make these investors more overconfident and adversely affect their investment performance." They find that, as expected, the data support this theory, concluding that "these results suggest that participation in virtual communities increases investors' propensity to commit investment mistakes and is likely to be detrimental to their investment performance."

- In "But Will It Make You Happy?" (*New York Times* 7 Aug 2010), Stephanie Rosenbloom reviews a range of recent research on what really makes us happy, and "emotional efficiency: how to reap the most happiness for your

dollar." As we have previously written, Rosenbloom also concludes that "one major finding is that spending money for an experience produces longer-lasting satisfaction than spending money on plain old stuff…Spending on experiences typically strengthens social bonds, which in turn helps amplify happiness." We have previously noted another channel from experience to heightened happiness: The ability to both repeat experiences through memory, and also to re-interpret them in a more positive light. Rosenbloom also notes that "according to retailers and analysts, consumers have gravitated more toward experiences than possessions over the last couple of years…Many retailing professionals think that this is not a fad, but rather the new normal...Industry professionals say they have difficulty identifying any retailer that is managing [to do an excellent job of adjusting to this trend], with one notable exception: Apple, which offers an interactive retail experience, including classes." As we have previously noted, we think this research has important implications for practice development efforts by financial advisers. Specifically, it points to the importance of providing potential and current clients with a series of experiences (e.g., educational newsletters and seminars), ideally in a context that enables them to form stronger social bonds with other people who share their interests, while not costing the adviser too much money to deliver (e.g., a seminar series, a hike, or a social service project). Put differently, it is not just the technical expertise of an adviser that counts, but also the quality and frequency of the experiences that he or she offers clients.

- In "Presenting Investment Results Asset by Asset Lowers Risk Taking" Anagol and Gamble confirm what many advisers already know from experience. The authors found that "presenting the results of participants' investment choices segregated by asset lowers their risk taking by 9%." Moreover, "among those participants who spent more than average time analyzing historical results, those who viewed results segregated by asset take on 13% less risk than

participants who view historic results from efficient portfolio combinations of these assets."

- In "The Causal Impact of Media in Financial Markets", Engleberg and Parsons seek to "disentangle the causal impact of media from the impact of the events being reported." They take a very innovative approach to analyzing this problem, "by comparing the behaviors of investors with access to different media coverage of the same event – earnings announcements of S&P 500 Index companies." They find that, "local media coverage strongly predicts local trading, after controlling for [a wide range of other factors].

The Implications of the Borg

On August 6, 2010, Tom Lauricella and Scott Patterson wrote an excellent summary in *The Wall Street Journal* of what is known so far about the causes of the May 6, 2010 "flash crash" in the U.S. equity market. Their key point is one we have previously made: "Three months later, many market veterans have arrived at a disquieting conclusion: a flash crash could happen again, because today's computer-driven stock market is much more fragile than many believed. Many investors, still gun-shy, have been pulling money out of stocks." As we have also previously noted, we do not believe that the majority of investors have fully absorbed the implications of changes that have occurred in financial markets over the past few years. We live today in a world characterized by multiple pools of liquidity (many of which, known colloquially as "dark pools" are only visible to some investors), in which the majority of trading volume is driven by ruthlessly efficient and constantly adapting algorithms, rather than human cognition and emotion. We have often called this the battle of the trading bots; in light of the implications of the flash crash, perhaps a better term would be a battle of the trading borg (for the Star Trek fans in our audience). In our view, the existence of ever more sophisticated and adaptive trading programs (algorithms) poses a fundamental challenge to those who believe that active management

(provided you can identify a skilled active manager) can outperform a relevant index over a long-period of time, on a risk adjusted basis, after all fees and expenses are taken into account.

Algorithms that systematically search for and seek to exploit anomalies and complex interrelationships between securities and securities markets have important implications. First, obvious anomalies and relationships (e.g., systematic "factor exposures") will quickly be discovered and their advantage competed away as algorithms seek to exploit them (to be sure, these anomalies and relationships will remain visible in raw data series, but not data series that take "real world" trading costs and expenses into account.

Second, this will shift the true battle ground of active management to the creation of new algorithms that can discover ever more obscure relationships (or "new factors"), and keep their existence secret for as long as possible (e.g., many have argued that this is the true secret behind Renaissance Technologies Medallion Fund). We have noted before about how this development builds on the "novel intelligence from massive datasets" or NIMD initiative that has been underway in the intelligence community, and received very substantial funding, since the 9/11/2001 terrorist attacks. As a practical matter, the critical question that any investor must ask an active manager whose process is based on taking different "factor exposures" (e.g., momentum, value, small cap, etc.) is "why should I expect you to succeed in the face of competition from algorithmic managers?"

Third, another practical consideration is that if, as we believe, the true high ground in active management based on taking systematic factor exposures has shifted to the quality of managers' learning and discovery algorithms, then most investors are ill-equipped to identify truly skilled managers. Indeed, the managers themselves are probably ill-equipped to make this judgment, except within very short time-frames. While some will point to Renaissance as the exception to this conclusion, our response is that the Medallion fund has been closed for years, and that Renaissance's more recent funds, that were structured to offer more liquidity to institutional investors,

have failed to match Medallion's track record. In other words, even Renaissance isn't perfect.

Fourth, as active management will always be a zero sum game, this raises the awkward question of out of whose pocket are coming the impressive returns being earned by the best algorithms. To be sure, some must come at the expense of market capitalization based index funds. As far as his argument goes, we agree with Rob Arnott that in a world where markets' pricing of assets can wander far from efficiency, market cap weighting systematically must overweight overvalued securities and underweight undervalued securities. That is the logical basis of the alternative index weighting schemes (e.g., Fundamental Indexing) he has done so much to popularize. Where we disagree with Rob is that he chooses not to take his argument to its final conclusion: If everyone adopted fundamental indexing, then it would transform into the market cap weighted indexing. Yet even fundamental indexing, as a systematic strategy whose logic is transparent can and undoubtedly is being exploited by algorithms, in the same manner that every other factor-based active strategy is being attacked and assimilated by the Borg.

Finally, as Star Trek also showed, there are important exceptions to the Borg's claim that "resistance is futile". We will focus on three we believe are critical. The first are active managers who employ a global macro strategy, forecasting changes in the returns to, and relationships between, broad global asset classes. In the complex adaptive system that encompasses politics, economics and the financial markets, causal factors are frequently complex, evolving, and non-linear in their impact. This makes it extremely hard for any human or algorithm to accurately forecast their effects; indeed, most writers about complex adaptive systems conclude that the best most of us can hope to achieve is a "coarse grained" understanding of their dynamics. However, evidence has also shown that a very few human beings have a combination of cognitive capacity and instinct that enables them to develop an understanding that goes beyond this (see, for example, The Logic of Failure by Dietrich Dorner). Investment managers with this rare skill, who apply it to the world of macro-strategy, have less to fear from the Borg than most of their peers.

The second group with less to fear is active managers who focus on company-specific rather than systematic factors. Call this good old fashioned value analysis. To be sure, the Borg's discover algorithms are constantly searching for new factors that progressively shrink the size of the company-specific, unique information space in which security-analysis driven active managers can compete. But even the Borg cannot completely eliminate this space, nor assimilate the active managers (or at least their profits) who compete in it. On the other hand, this presents a second order problem, because the investment consultants who evaluate active managers seem much more comfortable opining about "factor-based" managers and the sources of their returns than they are by with the sometimes inscrutable and evolving processes used by old fashioned company and security-focused value managers (of course, this observation also suggests that the Borg are a threat to the existence of the consulting profession – but that's a story for another time). In other words, the existence of the Borg has probably made it even more difficult to identify in advance the active managers who are truly skilled and therefore could, with a probability beyond sheer luck, deliver superior risk adjusted returns, after expenses and taxes, over a long period of time.

The third group of players who should be able to successfully resist the Borg are market capitalization based index funds (regardless of their form – e.g., mutual, UCITS, ETF, etc.). As noted above, it is impossible for fund managers, in aggregate, to beat the market, because they are the market. If you believe our assessment of the impact of the Borg, most of their superior active returns will come at the expense of other active managers, rather than market capitalization weighted index funds within a given asset class. At a portfolio level, the answer is less clear, because it is hard to establish just what constitutes a market capitalization weighted portfolio of multiple asset classes (e.g., asset classes like property and timber, with large percentages of their assets not traded present a problem, as do asset classes like commodities, volatility and bonds, where market capitalization is hard to define and/or calculate). Even at this level, however, we would expect that the majority of the Borg's gains would come at the expense of the most active managers.

A deep understanding of the Borg also leads to deeper worries that are outside the realm of risk and return. When people come to fully understand that the Borg are capturing an ever greater share of active management profits, and that only an elite few institutions and individuals can access the Borg's funds, what happens to people's perceptions of financial markets, the institutions that regulate them, and the political and industry leaders who are in charge of those institutions? In the best case, more and more of them start to invest in broadly based asset class index funds. In the worst case, the majority's perception of financial markets as a rigged casino that is making it impossible for them to realize their long-term financial goals becomes even worse than it is today. And it seems inevitable that the loss of faith and trust in financial markets as an institution would have very dangerous consequences that are hard to envision at this point. But we're betting they wouldn't be pretty. We apologize if you are sitting in a beach chair somewhere while reading this, and we have made your holiday less restful. However, we don't think that the full implications of the Borg are widely (or even narrowly) understood at this point, that a lot is at stake in how this issue evolves, and that it is one that investors much carefully monitor in the months ahead.

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