The Index Investor

Invest Wisely…Get an Impartial Second Opinion.

Contents

September 2010 Issue: Key Points

Our current analytical framework is based on the assumption 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. They include deleveraging, inadequate aggregate demand, the threat of deflation, and a growing crisis of political legitimacy, for both the international system and many domestic political systems. This month we take an extended look at the latter issue, starting with theoretical frameworks for thinking about it, and then looking at recent evidence that is not consistent with the hypothesis that a crisis does not exist. We conclude that a crisis of political legitimacy is indeed growing, and will likely first affect the international monetary and trade system, and that the probability of our

ISSN 1554-5075

"collapse into competing blocs" scenario is higher than it has ever been. We conclude with a review of the potential impact of this scenario on asset class returns.

In this month's Product and Strategy Notes, we summarize four very interesting recent research papers (which can all be found online, e.g., at ssrn.com). Two are on the application of complex adaptive systems theory to financial markets, one is about an improved approach to combining expert forecasts, and the last compares the investment results achieved by managers with CFAs and MBAs.

Global Asset Class Returns

YTD31Aug10	In USD	In AUD	In CAD	In EUR	In JPY	In GBP	In CHF	In INR
Asset Held								
USD Bonds	8.21%	9.24%	9.90%	19.62%	-2.66%	13.04%	6.25%	9.28%
USD Prop.	14.44%	15.47%	16.13%	25.86%	3.58%	19.27%	12.49%	15.51%
USD Equity	-4.20%	-3.17%	-2.51%	7.22%	-15.06%	0.63%	-6.15%	-3.13%
AUD Bonds	8.52%	9.55%	10.20%	19.93%	-2.35%	13.35%	6.56%	9.59%
AUD Prop.	1.31%	2.34%	2.99%	12.72%	-9.56%	6.14%	-0.65%	2.38%
AUD Equity	-8.17%	-7.14%	-6.48%	3.24%	-19.04%	-3.34%	-10.13%	-7.10%
CAD Bonds	4.32%	5.36%	6.01%	15.74%	-6.54%	9.15%	2.37%	5.39%
CAD Prop.	15.80%	16.84%	17.49%	27.22%	4.94%	20.63%	13.85%	16.87%
CAD Equity	1.58%	2.61%	3.26%	12.99%	-9.29%	6.41%	-0.38%	2.65%
CHF Bonds	11.00%	12.04%	12.69%	22.42%	0.14%	15.83%	9.05%	12.07%
CHF Prop.	18.30%	19.34%	19.99%	29.72%	7.44%	23.13%	16.35%	19.37%
CHF Equity	-3.10%	-2.07%	-1.41%	8.32%	-13.96%	1.73%	-5.05%	-2.03%
INR Bonds	-2.99%	-1.95%	-1.30%	8.43%	-13.85%	1.84%	-4.94%	-1.92%
INR Equity	2.20%	3.24%	3.89%	13.62%	-8.66%	7.03%	0.25%	3.27%
EUR Bonds	1.96%	2.99%	3.65%	13.38%	-8.90%	6.79%	0.01%	3.03%
EUR Prop.	-5.54%	-4.50%	-3.85%	5.88%	-16.40%	-0.71%	-7.49%	-4.47%
EUR Equity	-18.47%	-17.43%	-16.78%	-7.05%	-29.33%	-13.64%	-20.42%	-17.40%
JPY Bonds	13.98%	15.01%	15.66%	25.39%	3.11%	18.81%	12.02%	15.05%
JPY Prop.	17.19%	18.22%	18.87%	28.60%	6.32%	22.02%	15.23%	18.26%
JPY Equity	-3.70%	-2.66%	-2.01%	7.72%	-14.56%	1.13%	-5.65%	-2.63%
GBP Bonds	5.05%	6.08%	6.74%	16.46%	-5.82%	9.88%	3.09%	6.12%
GBP Prop.	-2.76%	-1.73%	-1.07%	8.65%	-13.63%	2.07%	-4.72%	-1.69%
GBP Equity	-6.04%	-5.00%	-4.35%	5.38%	-16.90%	-1.21%	-7.99%	-4.97%

ISSN 1554-5075

YTD31Aug10	In USD	In AUD	In CAD	In EUR	In JPY	In GBP	In CHF	In INR
1-3 Yr USGvt	2.30%	3.34%	3.99%	13.72%	-8.56%	7.13%	0.35%	3.37%
World Bonds	2.08%	3.12%	3.77%	13.50%	-8.78%	6.91%	0.13%	3.15%
World Prop.	6.39%	7.43%	8.08%	17.81%	-4.47%	11.22%	4.44%	7.46%
World Equity	-5.55%	-4.51%	-3.86%	5.87%	-16.41%	-0.72%	-7.50%	-4.48%
Commod Long Futures	-6.86%	-5.83%	-5.17%	4.55%	-17.73%	-2.03%	-8.82%	-5.79%
Commod L/Shrt	-25.41%	-24.37%	-23.72%	-13.99%	-36.27%	-20.58%	-27.36%	-24.34%
Gold	13.76%	14.80%	15.45%	25.18%	2.90%	18.59%	11.81%	14.83%
Timber	0.61%	1.64%	2.29%	12.02%	-10.26%	5.44%	-1.35%	1.68%
Uncorrel Alpha	1.07%	2.11%	2.76%	12.49%	-9.79%	5.90%	-0.88%	2.14%
Volatility VIX	33.80%	34.83%	35.48%	45.21%	22.93%	38.63%	31.84%	34.87%
Currency								
AUD	-1.03%	0.00%	0.65%	10.38%	-11.90%	3.80%	-2.99%	0.04%
CAD	-1.69%	-0.65%	0.00%	9.73%	-12.55%	3.14%	-3.64%	-0.62%
EUR	-11.42%	-10.38%	-9.73%	0.00%	-22.28%	-6.59%	-13.37%	-10.35%
JPY	10.86%	11.90%	12.55%	22.28%	0.00%	15.69%	8.91%	11.93%
GBP	-4.83%	-3.80%	-3.14%	6.59%	-15.69%	0.00%	-6.78%	-3.76%
USD	0.00%	1.03%	1.69%	11.42%	-10.86%	4.83%	-1.95%	1.07%
CHF	1.95%	2.99%	3.64%	13.37%	-8.91%	6.78%	0.00%	3.02%
INR	-1.07%	-0.04%	0.62%	10.35%	-11.93%	3.76%	-3.02%	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

ISSN 1554-5075

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 31Aug10	**In USD**	**In AUD**	**In CAD**	**In EUR**	**In JPY**	**In GBP**	**In CHF**	**In INR**
Eq Mkt Neutral								
HSKAX	-3.01%	-1.97%	-1.32%	8.41%	-13.87%	1.82%	-4.96%	-1.94%
OGNAX	-4.08%	-3.05%	-2.40%	7.33%	-14.95%	0.75%	-6.04%	-3.01%
Arbitrage								
ARBFX	1.10%	2.14%	2.79%	12.52%	-9.76%	5.93%	-0.85%	2.17%
ADANX	2.23%	3.26%	3.91%	13.64%	-8.64%	7.06%	0.27%	3.30%
Currency								
DBV	-7.09%	-6.06%	-5.41%	4.32%	-17.96%	-2.26%	-9.05%	-6.02%
ICI	-0.46%	0.57%	1.23%	10.96%	-11.32%	4.37%	-2.41%	0.61%
Equity L/S								
HSGFX	4.85%	5.89%	6.54%	16.27%	-6.01%	9.68%	2.90%	5.92%
PTFAX	9.84%	10.88%	11.53%	21.26%	-1.02%	14.67%	7.89%	10.91%
GTAA								
MDLOX	-1.59%	-0.56%	0.09%	9.82%	-12.46%	3.24%	-3.55%	-0.52%
PASAX	8.96%	9.99%	10.65%	20.37%	-1.91%	13.79%	7.00%	10.03%

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

ISSN 1554-5075

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

ISSN 1554-5075

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.

ISSN 1554-5075

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.

ISSN 1554-5075

Table: Market Implied Regime Expectations and Three Year Return Forecast

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

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

Rolling Three Month Returns in USD		31Aug10
High Uncertainty	***High Inflation***	***Normal Growth***
Short Maturity US Govt Bonds (SHY) **0.85%**	US Real Return Bonds (TIP) **2.97%**	US Equity (VTI) **-3.96%**
1 - 3 Year International Treasury Bonds (ISHG) **5.74%**	Long Commodities (DJP) **4.26%**	EAFE Equity (EFA) **3.35%**
Equity Volatility (VIX) **-18.77%**	Global Commercial Property (RWO) **7.29%**	Emerging Equity (EEM) **5.14%**

ISSN 1554-5075

Rolling Three Month Returns in USD		31Aug10
High Uncertainty	***High Inflation***	***Normal Growth***
Gold (GLD) **2.69%**	Long Maturity Nominal Treasury Bonds (TLT)* **13.49%**	High Yield Bonds (HYG) **5.21%**
Average ***-2.37%*** ***Three Months Ago:*** ***-7.91%***	***Average (with TLT short)*** ***0.26%*** ***Three Months Ago:*** ***.41%***	***Average*** ***2.44%*** ***Three Months Ago:*** ***-.22%***

* Falling returns on TLT indicate rising inflation expectations

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

Our approach to estimating returns under this regime is to appropriate risk premiums for different asset classes to our estimate of the equilibrium yield on risk return bonds when the system is operating under normal conditions. In contrast, the high uncertainty and high inflation regimes are very much disequilibrium conditions in which investor behavior determines the returns that are actually supplied. Under these

ISSN 1554-5075

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:

ISSN 1554-5075

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*
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 **31 Aug 10**. We believe that asset prices reflect the interaction of

ISSN 1554-5075

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"

ISSN 1554-5075

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.

ISSN 1554-5075

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 31Aug10	***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	4.10%	1.13%
AUD Bonds	Neutral	6.08%	0.95%
AUD Property	Likely Undervalued	4.22%	-0.96%
AUD Equity	Neutral	0.39%	-3.37%
CAD Real Bonds	Neutral	3.34%	2.00%
CAD Bonds	Neutral	3.64%	0.65%
CAD Property	Likely Undervalued	13.48%	0.08%
CAD Equity	Possibly Overvalued	2.39%	1.24%
CHF Bonds	Likely Overvalued	4.23%	3.40%
CHF Property	Likely Overvalued	9.14%	0.89%
CHF Equity	Neutral	-3.59%	-3.42%
EUR Real Bonds	Neutral	2.05%	2.89%
EUR Bonds	Possibly Overvalued	5.52%	4.37%
EUR Prop.	Neutral	8.63%	-3.97%
EUR Equity	Possibly Undervalued	-1.24%	-0.08%
GBP Real Bonds	Possibly Overvalued	4.57%	2.85%
GBP Bonds	Neutral	5.78%	3.57%
GBP Property	Possibly Undervalued	11.26%	-2.85%
GBP Equity	Probably Undervalued	-0.08%	-0.67%
INR Bonds	Likely Overvalued	-1.48%	1.60%
INR Equity	Probably Overvalued	9.67%	1.18%

ISSN 1554-5075

Valuation at 31Aug10	*Current Price versus Long-Term Fundamental Valuation Estimate*	*Rolling 3 Month Return in Local Currency*	*Rolling 3 Month Return 3 Months Ago*
JPY Real Bonds	Neutral	3.06%	-0.75%
JPY Bonds	Possibly Overvalued	2.91%	0.40%
JPY Property	Likely Undervalued	1.00%	1.81%
JPY Equity	Probably Overvalued	-10.42%	-1.97%
USD Real Bonds	Neutral	3.28%	2.51%
USD Bonds	Possibly Overvalued	4.26%	1.65%
USD Property	Neutral	2.69%	11.52%
USD Equity	Probably Overvalued	-3.85%	-0.10%
Following in USD:			
Investment Grade Credit (CIU)	Possibly Overvalued	4.63%	1.20%
High Yield Credit (HYG)	Probably Overvalued	5.05%	-0.70%
Emerging Mkt Equity (EEM)	Probably Overvalued	6.75%	-11.48%
Commodities Long	Likely Overvalued	4.26%	-6.70%
Gold	Likely Overvalued	2.69%	8.64%
Timber	Likely Undervalued	1.86%	2.25%
Uncorrelated Alpha	N/A	0.93%	-0.44%
Volatility (VIX)	Neutral	-18.77%	64.46%
Future Return in Local Currency from holding USD:	***Based on Covered Interest Parity***		
Returns to AUD Investor	Positive	-5.35%	6.29%
Returns to CAD Investor	Neutral	1.59%	-0.71%
Returns to EUR Investor	Neutral	-2.67%	9.14%
Returns to JPY Investor	Negative	-8.80%	2.62%
Returns to GBP Investor	Neutral	-4.72%	4.06%
Returns to CHF Investor	Negative	-11.29%	6.64%
Returns to INR Investor	Positive	1.44%	0.57%

ISSN 1554-5075

Investor Herding Risk Analysis

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

As a practical matter, the challenge for investors has been to identify variables or statistics that can be used to track the strengthening of networks that is often associated with phase transitions. With this in mind, we call readers' attention to an excellent paper by Lisa Borland, of the asset management firm Evnine and Associates in San Francisco ("Statistical Signatures in Times of Panic: Markets as a Self Organizing System"). Using the phase transition approach, Borland searched for statistical signatures of market panics, and proposes a new order parameter that is easy to calculate and appears to capture the changing dynamics of asset return correlations and the underlying social network and herding phenomena that give rise to them. The parameter equals the number of financial markets or assets that have positive returns over a given interval (in 2010 we switched from YTD to just the past

ISSN 1554-5075

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:

Sep	Oct	Nov	Dec09	Jan10	Feb10	Mar10	Apr10	May10	Jun10	Jul10	Aug10
0.56	(0.30)	0.72	0.24	(0.03)	0.30	0.46	0.44	(0.28)	0.28	0.35	0.24

Given these data, we conclude that at **31 Aug 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

Many of the commentators I read have noted the inconsistency of low bond yields, high gold prices, and high equity market valuations. How do you make sense of this apparent contradiction?

We have also thought a lot about the situation you describe, and would add one more element to it: yields on real return bonds are also very low. As you know, we believe that financial markets usually operate in a disequilibrium state, and that bubbles are not only possible, but likely (though their size probably follows a power law distribution). That logically leads us to three hypotheses about bubbles that might explain current asset class valuations and yields: (1) Equities are overvalued; (2) Gold

ISSN 1554-5075

is overvalued; and (3) Government bonds are overvalued. The following table shows our assessment of these hypotheses:

	Equity Bubble	***Gold Bubble***	***Bond Bubble***
Low Real Return Bond Yields	• Low yield reflects low expected real GDP growth	• Low yield reflects low expected real GDP growth	• Low yield reflects low expected real GDP growth, and/or high demand for assets that hedge inflation risk
Low Nominal Return Bond Yields	• Low yield reflects expectations of low inflation or actual deflation	• Low yield reflects expectations of low inflation or actual deflation	• Logically explains this (e.g., government action is holding down bond yields, and preventing recognition in prices of high future expected inflation)
High Equity Valuations	• Logically explains this	• At best, if market expects deflation, real expected dividend yield is higher than nominal, which could, to some extent, explain equity valuations	• In order for equity valuations to be consistent with this hypothesis, there would have to be evidence that equities are a good inflation hedge. This evidence doesn't exist.

ISSN 1554-5075

	Equity Bubble	***Gold Bubble***	***Bond Bubble***
High Gold Price	• Inconsistent with hypothesis	• Logically explains this	• High expected future inflation is consistent with this

On balance, our view is that the hypothesis that is most consistent with the evidence is that there is a bubble in the gold market today. It may also be the case that valuations in the equity market today reflect algorithmic and other momentum traders, rather than a widely held view about the attractiveness of current valuations. Evidence for this hypothesis includes the relatively thin trading volume, as well as the significant value of net retail outflows from equity market investments.

We are clearly experiencing economic conditions that are very different from anything most of today's investors have ever seen before. Since your model portfolios are based on historical real returns, have they now been invalidated by events? And if so, where does that leave us?

We agree with you on the first point. With respect to the second, our current model portfolios are based on a regime switching model. The first regime was indeed based on historical real returns. However, we also used a second regime that was based on much lower real returns. Each regime received a 50% probability. So we don't agree that recent events have wholly invalidated our approach. With respect to your third point, in recent years we have emphasized the importance of using the equally weighted portfolio as a starting point for asset allocation, as it assumes no forecasting skill, and only an ability to define asset classes. Some have asked why we don't start with the market capitalization weighted portfolio. Our response has been that (1) in some asset classes, market capitalization weights are either hard to calculate (e.g., commodities) or intellectually questionable (e.g., bonds); and (2) The existence of bubbles in markets that usually operate in disequilibrium raise questions about the validity of market cap weights as a starting point. That said, if everybody started with

ISSN 1554-5075

equal weighting, what you would end up with is a different version of the market cap weighted portfolio – so we acknowledge that there is a bit of a paradox at the heart of our thinking. In our view, one's willingness to move away from equal weighting should be a function of different preferences (e.g., for more liquidity) and/or the degree of confidence in either your own or someone else's forecasting skill. With respect to the latter, we have repeatedly noted over the past fourteen years that we are much more confident in our ability to forecast the relative riskiness of different asset classes over a given period of time than we are in our ability to forecast their relative returns. Finally, even in a radically different environment, we can still think systematically about valuation, and take steps to limit downside risk when an asset class appears to be dangerously overvalued. So, even in a world that is far different from anything previously experienced, we believe there is still a basis for thinking logically about asset allocation.

With sovereign debt ratings all over the world in question, are real return bonds truly the risk free asset anymore, or is it gold?

As practical matter, when it comes to valuation calculations, because there is an explicit yield on real return bonds, we believe that they will remain the most useful risk free asset to use. That said, we take your point about sovereign credit ratings and willingness to pay being important issues to monitor in this area. For example, we really can't see a real return bond issued by the government of Greece in the same light as one issued by the government of the United States. With respect to gold, on one level, we agree with you. We have always recommended an allocation to gold coins as part of an investor's liquid reserve. However, we also recognize that as asset class investment, because of the absence of an explicit yield, gold has a structural tendency towards bubbles and crashes that makes it anything but "risk free."

Last month you noted that some analysts have questioned whether governments around the world have been changing their methodologies over time to understate the true extent of inflation. Since you use these numbers to calculate real returns on

ISSN 1554-5075

different asset classes, if the allegations are true, how does this affect the validity of your portfolio allocations?

If the understatement of inflation was consistent over time, absolute real returns would be lower, but their relative ranking would stay the same. Hence, our asset class weights would also remain the same, but the probability of achieving different long term real return targets would be lower. However, this is unlikely to be the case, as there have been frequent changes over time in the methodologies used by different governments to estimate inflation. This would certainly affect our estimates of historical real returns, but again would not affect their relative ranking. On balance, I think the general conclusion is that the most important impact of changing inflation measurement methodologies is to reduce, perhaps substantially, the probability of achieving a given long term real return target.

Feature Article: The Growing Political Legitimacy Crisis

Our current analytical framework is based on the assumption 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

ISSN 1554-5075

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 that function as control parameters for the global economy and financial markets. These institutions are both international (e.g. rules governing multilateral trade and capital flows) and domestic (e.g., rules governing taxation and redistribution), 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,

ISSN 1554-5075

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).

This month, we will focus on the growing risks to the legitimacy of political institutions, which we first wrote about in our May 2010 issue. Our starting point will be different frameworks for understanding (and organizing evidence about) the issue of declining political legitimacy. Broadly speaking, there are two ways to construct these frameworks: deductively, by combining existing theories, and inductively, by drawing insights from historical evidence. We'll begin with deductive frameworks, drawn from complex adaptive systems theory.

The evolutionary process that drives adaptation can be described quite simply. Since the resources available to them are not infinite, to achieve their goals in the face of competition systems must generate variations – new ways of thinking or behaving. These variations are evaluated against a set of "selection criteria", with those passing this test implemented. Those that produce the best results are reinforced via the provision of additional scarce resources. Organisms and organizations also have "fitness criteria" that enable them to measure their performance against three generic criteria (indeed, all performance measures are variations on this basic set): (1) effectiveness, or results relative to goals; (2) efficiency, or the amount of resources used to achieve those results; and (3) adaptability, or the change in effectiveness and efficiency per unit of change in the external environment. Within this framework,

ISSN 1554-5075

legitimacy is a function of the extent to which fitness criteria match selection criteria – put differently, is the organization incentivizing (via its fitness measures) those behaviors that are needed to ensure its survival, given the selection criteria it faces. Seen from this perspective, crises of legitimacy develop when either the gap between fitness and selection criteria grows wide, and/or when intensification of the selection environment (e.g., a rise in extinctions due to a fall in available resources) magnifies the impact of even small gaps between fitness and selection criteria.

The second approach to the legitimacy issue is based on the work of Stuart Kauffman, who popularized the use of so-called "NK landscape" models to explain the behavior of complex adaptive systems (see his book, The Origins of Order). An organization or society's performance can be described in terms of the sum of the fitness of the individual agents (e.g., individuals or groups) that comprise it. In the NK model, "N" represents the number of agents. The fitness of an agent is a function not only the result of the decisions it makes, but also on the decisions made by some fraction of the other agents in the organization. In the NKCS model, "K" refers to the number of other agents that affect a given agent's fitness– hence its value can range from zero to N-1. The term "landscape" refers to a metaphor that describes differing levels of organizational fitness as mountain peaks of different heights. When the degree of interrelationship between agents' fitness (K) is low relative to the number of agents (N), the "fitness landscape" is relatively smooth, with only a few peaks. On this type of landscape, it is easy to see the combination of decisions that generates the highest level of fitness. However, as the interrelationship between agents' fitness increases (K becomes larger), the fitness landscape becomes much more jagged, and it is much more difficult to identify (and agree on) the combination of agent decisions that results in the highest level of organizational fitness. As long as selection pressure in the environment is low, the organization can continue to exist, even with a high degree of K relative to N. However, once selection pressures increase, the high degree of K makes it very difficult for an organization to adapt, as agents will resist decisions that would negatively affect their individual fitness, even if they would raise the overall fitness (and therefore chances of survival) of the organization as a whole.

ISSN 1554-5075

This is very similar to the phenomenon of public policy paralysis induced by a rising number of special interest groups described in 1982 by the political scientist Mancur Olson in his book, The Rise and Decline of Nations. Seen from this perspective, crises of legitimacy arise due to intensifying conflict between rising selection pressure and a high K organization's inability to make the changes necessary to increase its chances of survival.

The third approach to the legitimacy issue is based on social network dynamics, and the way information, ideas, and behavioral norms propagate through them. A social network is defined by individual people and the links between them. Different network types are defined by the structure and nature of these links. Many social networks are so-called "scale free" networks, because the number of links per individual follows a power law (exponential) distribution, with most people having relatively few links to others, while a few individuals are very highly connected. In some cases, a single link between individuals is sufficient to transmit information or an infection, as in the case of social network models of opinion formation or influenza infection. However, there are also situations where a single link between two individuals is not sufficient to generate transmission. As described by Centola and Macy (in their paper, "Complex Contagions and the Weakness of Long Ties"), "when behaviors are costly, risky or controversial, the willingness to participate [i.e., to change one's behavior] may require independent affirmation or reinforcement from multiple sources. We call these 'complex contagions' because successful transmission requires interaction with multiple carriers…Many collective behaviors involve complex contagions that require social affirmation or reinforcement from multiple sources…For complex contagions to spread, multiple sources of activation are required." Hence, complex contagions are more likely to spread when individuals in a network observe the new behavior or belief in a significant number of the other individuals to whom they are linked. Other research has estimated that for most people, the maximum size of this socially relevant group is about 150 (see "Neocortex Size as a Constraint on Group Size in Primates" by Robert Dunbar).

ISSN 1554-5075

More specifically, two conditions are required for the transmission of a complex contagion. First, an individual has to be susceptible to it, in the sense that his or her current behavior or beliefs are not achieving goals or satisfying needs that are important to the individual. Second, a threshold must be met, with a minimum number of other linked individuals adopting the new behavior or belief (for good new paper on modeling these transitions, see "From Theory to Simulation: They Dynamic Political Hierarchy in Country Virtualization Models" by Lustick, Alcorn, Garces and Ruvinsky).

In the context of the changes in collective beliefs and behavior that triggers a political legitimacy crisis, we believe the susceptibility criterion is ultimately grounded in a sufficient number of people fearing for their future. In our view, one must have a very powerful motivator to question the legitimacy of a political system, and only fear can provide that. In previous issues, we have written at length about the complex neurobiology of fear, and the role played by the amygdala (a primitive part of our brain). To simplify, there are two key primary fear triggers: the experience of uncertainty, and the experience of loss. The latter can be either absolute, as in the loss of resources, or relative, as in the loss of social standing. Once primary fear is triggered, people also experience a heightened secondary fear of social isolation. All of these emotional reactions probably increased our ancestors' chances for survival on the East African plain, and are therefore likely hardwired into us as human beings.

With respect to the threshold criterion, research has shown that there is a complicated relationship between the emotions triggered by gains and losses and whether they result from our action or inaction, as shown in the following table:

	Result = Gain	**Result = Loss**
Action (Commission)	*Gain for Self Triggers Pride*	*Loss for Self Triggers Regret*
Inaction (Omission)	*Gain for Others (but not Self) Triggers Envy*	*Loss for Others (but not Self) Triggers Relief*

ISSN 1554-5075

More specifically, human beings' emotional reaction to gains and losses, and preferences for errors of commission and omission, seem to be deeply connected with whether those gains and losses are private or visible to a socially important group. When they know the results will be private, human beings prefer errors of omission, in order to avoid feeling regret. However, when the results will be public, they prefer errors of commission to avoid feelings of envy (see "Interdependent Utilities: How Social Ranking Affects Choice Behavior" by Bault, Coricelli, and Rustichini). Think of this as a switch from a system dominated by negative feedback to one dominated by positive feedback. From this perspective, political legitimacy crises result when a social network passes two critical points: first, feelings of fear in a sufficiently large number of people, and second, a willingness to go beyond our natural preference for errors of omission rather than errors of commission, because enough socially important individuals to whom an individual is linked are adopting new beliefs and behaviors.

This is not to say that all situations that pass the susceptibility and social threshold tests will trigger a legitimacy crisis or meet with success. A full blown crisis requires that collective action is undertaken not just by isolated local networks of individuals, but by many such networks in parallel. In this regard, modern technology has made this transition much more likely, as it has enabled the creation of vastly more network links, both between local individuals and between local networks themselves. So called "flash mobs" are one example of this, as are the "color revolutions" we have seen in recent years. However, as China showed at Tiananmen Square in 1989, and Iran showed more recently, the fact that a legitimacy crisis erupts is no guarantee that it will bring immediate results in a positive direction, particularly when a threatened group has greater willingness and ability to use force to preserve the current system. However, that willingness is itself grounded in a social network phenomenon, whether it was China's use of soldiers from the remote far western region of the country to attack the Tiananmen protestors, or Iran's use of the Basij militia to repress the building Green Revolution. In other cases (e.g., East Germany in

ISSN 1554-5075

1989), that willingness was undermined when a sufficiently large number of a group capable of using force observed the opposition to this by enough members of their individual networks. In this regard, a common characteristic of both the Chinese and Iranian experience was the relative isolation (either physical, in the case of the Chinese soldiers, or cultural, in the case of the Basij) of the groups employed by the respective regimes to use force to repress political legitimacy crises and the mass collective action they triggered.

Let us now turn from deductive to inductive frameworks for understanding legitimacy crises. Perhaps the best of these has been developed by the Political Instability Task Force, a group of scholars that was originally formed in 1994 and whose work was funded by the U.S. Central Intelligence Agency (the task force's public website can be found at http://globalpolicy.gmu.edu/pitf/). In their paper "Modeling Transitions To and From Democracy", Ulfelder and Lustik summarize the key factors that are associated with these two types of political legitimacy crises (see also, "How to Construct Stable Democracies" by Goldstone and Ufelder):

Transitions from Authoritarian to Democratic Systems	***Transitions from Democratic to Authoritarian Systems***
• Improving economic conditions, when country has previous experience with democracy (when it does not, improving economic conditions lower the probability of transition). Decreasing economic performance increases probability of transition.	• Increasingly factionalized political competition increases the probability of transition. This is characterized by (1) heightened parochialism (major political parties focus on interest of narrow group, rather than nation as a whole); (2) heightened polarization (competition over central authority increasingly a winner-take-all struggle); and (3) rising mobilization (rival groups pursuing interests through collective action)
• Higher share of state revenues from	• Deteriorating economic

ISSN 1554-5075

Transitions from Authoritarian to Democratic Systems	***Transitions from Democratic to Authoritarian Systems***
minerals or hydrocarbons reduces probability of transition	performance increases the probability of transition
• Higher civil liberties increases probability of transition	• Risk for new democracies is highest between years 2 to 15
• Non-violent collective actions within past three years increases probability of transition	
• Recent leadership change increases probability of transition	

Let us now move from theoretical frameworks for predicting the onset of legitimacy crises, and look at evidence that is not consistent with the hypothesis that we will not face political legitimacy crises over the next few years.

From a complex adaptive systems perspective, there is ample evidence that selection pressures have been increasing in recent years. In labor markets, workers have found their jobs and incomes under growing pressure from the twin forces of more intense global competition and more effective information technology (see, for example, Acemoglu and Autor's excellent new paper, "Skills, Tasks, and Technologies: Implications for Employment and Earnings", and David Autor's must-read, "The Polarization of Job Opportunities in the U.S. Labor Market" – both of which can be found on www.ssrn.com). The result has been a widening income distribution in many countries, the consumption and political effects of which were, until 2008, somewhat reduced by rising levels of household debt. But now those chickens have come home to roost. In the markets for goods and services, companies in an ever widening number of sectors and countries have faced intensifying competition, and constant pressure to deliver ever more value to customers while increasing the returns they provide to their investors – or else. One could even argue that selection pressures have increased at the level of the nation-state itself, with an increasingly

ISSN 1554-5075

fierce struggle to capture or hold a share of declining global aggregate demand and/or maintain access to resources that are in increasingly short supply (e.g., possibly entrepreneurs, probably oil, and certainly rare earth metals).

There is also evidence that in many cases, either fitness metrics are increasingly at odds with selection criteria, and/or that fitness improvement in the face of intensifying selection pressure has been constrained by political paralysis caused by factional competition. For example, in the United States, there has been a sharp increase in public anger at the poor value for money produced by public schools, and at the teachers unions that are perceived to be a central obstacle to progress. Recent years have seen a substantial increase in public critiques of the U.S. public school system. To cite but one, in 2005, the National Academies published a landmark report ("The Gathering Storm") that focused on "the ability of America and Americans' to compete for jobs in the global economy." It concluded that "a primary driver of the future economy and concomitant creation of jobs will be innovation", and it "assessed the principal ingredients of innovation and competitiveness: knowledge capital, human capital and a creative ecosystem…The most pervasive concern was considered to be the state of United States' K-12 education, which on average is a laggard among industrial economies, while costing more per student than any other OECD country." Indeed, as President Obama recently noted, (in his speech to the National Urban League), "education is an economic issue, if not the economic issue of our time."

This year, the "Gathering Storm" report was updated. "The unanimous view…is that [the United States'] outlook has worsened…Our public school system…has shown little sign of improvement, particularly in mathematics and science…[and that] the outlook for America to compete for quality jobs has further deteriorated over the past five years." The report somberly concludes that "the Gathering Storm increasingly appears to be a Category 5" (see "Rising Above the Gathering Storm, Revisited" published by the National Academy of Sciences). Despite these reports, America's teachers unions have resisted changes that would differentially compensate teachers on the basis of performance, and make it easier to terminate poor performers and implement new innovations in public schools. At the same time, teachers unions have

ISSN 1554-5075

continued to demand ever higher compensation and benefits from already over-streched and uncertain taxpayers. Evidence of the growing public resentment of teachers that these trends have produced is found not only in polling data (where respect for them has plummeted), but also in a just released new movie, "Waiting for Superman", that was made by Davis Guggenheim, who also made "An Inconvenient Truth." From a social network perspective, growing doubts about the legitimacy of public school governance (and in particular, the role played by teachers unions) reflects both a susceptibility trigger (fear for your children's future standard of living, and/or fear for the country's future ability to compete) and a threshold trigger (realization that others in your social network, as well as the broader society share your frustration, shared agreement on the source of the problem). What we have yet to see are opportunities for collective behavior to change this situation; however, it seems clear that all the preconditions for this to occur have been met.

America's public school experience is just one part of a growing conflict throughout the developed world between public sector employees who are generally unionized, well-compensated, and fiercely resistant to change, and a much larger public that is demanding much more effective, efficient and adaptable government that they know is critical to their ability to cope with the rising selection pressures they face in different aspects of their lives (e.g., see "America's Public Servants are Now Its Masters" by Mort Zuckerman in the 9Sep10 *Financial Times*). Again, all the precursors for a legitimacy crisis seem to be in place, from a mismatch between fitness and selection metrics (e.g., politicians who give in to union demands to get reelected, even as those demands are slowly bankrupting governments); well-organized interest groups that frustrate change in the face of growing selection pressure; and fearful people who increasingly realize that others in their network share their frustration and who are ready to engage in collective behavior to change the threatening situation.

In turn, this has led to growing frustration in many countries with political systems and politicians that seem unable to either create legislative majorities for, and/or ensure bureaucratic implementation of, changes that are critical to coping with intensifying selection pressures (see, for example, Peggy Noonan on "Why It's Time

ISSN 1554-5075

for the Tea Party" in the 17Sep10 *Wall Street Journal*, Tom Friedman on "The Tea Kettle Movement" in the 28Sep10 *New York Times*, David Brooks on "The Responsibility Deficit" in the 23Sep10 *New York Times*, and Joel Kotkin's "The Golden State's War on Itself" in the Summer 2010 *City Journal*). From a social network perspective, more and more people are fearful for their jobs and their futures, and increasingly frustrated by the inability of the political system to respond in a manner that reduces these fears. More important, they increasingly realize that many other people in their social networks – and in similar networks around their countries, if not the world – share their fear. The Tea Party movement in the United States is a logical result of this situation, and shows that for a growing number of people, the collective action threshold has been passed.

However, this still begs the question of the extent to which these growing frustrations and signs of collective action are translating into a growing crisis of political legitimacy. In our view, there is evidence that this is, in fact, occurring. For example, a growing number of commentators have noted the sharply widening gap in the United States, and likely in other countries as well, between the views of the elite and the views of the masses. For example, the pollster Scott Rasumussen has found that 68% of likely voters "say the political class doesn't care what most Americans think", while 84% say that America is headed in the wrong direction. In contrast, 67% of what Rasmussen terms the "political class" thinks America is headed in the right direction (for more of his analysis, see Rasmussen's recently published book, In Search of Self Governance). Peggy Noonan also captured this sentiment in a recent Wall Street Journal column ("America Is At Risk of Boiling Over", 6Aug10). She notes that "The biggest change in my political lifetime is that Americans no longer assume that their children will have it better than they did. This is a huge break with the past, with assumptions and traditions that have shaped us." She then asks, "but do our political leaders have any sense of what people are feeling deep down? They don't act as if they do. I think their detachment from how normal people think is more dangerous and disturbing than it has been in the past…I've never seen the gap wider than it is now. I think it is a chasm…When the adults of a great nation feel long term pessimism, it only

ISSN 1554-5075

makes matters worse when those in authority take actions that reveal their detachment from those concerns – even from the essential nature of their fellow citizens. And it makes those citizens feel powerless. Inner pessimism and powerlessness: That is a dangerous combination."

In the July/August 2010 edition of the *American Spectator*, professor Angelo Codevilla offers an extensive analysis of this growing split in his article "America's Ruling Class – And the Perils of Revolution." He begins with an examination of the nature of what he terms the United States' "ruling" or "political class" and the widening gap between the nation's leaders and the led – what Codevilla terms the Country Class. He also shows how difficult it will be to use existing institutions to enact the Country Class's agenda, in large part because of America's "lost capacity for self-governance" due to the takeover of local governments by public sector unions, the limits placed on local action by federal regulations and judicial decisions, and the "takeover of the federal government by interest groups." Codevilla darkly concludes that, "for the foreseeable future, American politics will consist of a prolonged confrontation between the Ruling Class and the much larger Country Class."

Is this increasing tension unique to the United States? There is growing evidence that is not. To cite just a few examples, the imposition of austerity to solve the problem of excessive leverage has led to riots and street demonstrations in Europe, improving electoral results for far right parties, and a large number of articles questioning the sustainability of the Euro and perhaps the European Union itself. On the other side of the world, there are increasing indicators of threats to the legitimacy of domestic Chinese political institutions, from growing concerns with corruption, environmental degradation and income inequality, to rising labor unrest and demands for higher wages, to complaints about property price rises that put middle class aspirations increasingly out of reach, to growing worries about the social impact of rising unemployment as China's export model is hobbled by a weak global economy, to the policy paralysis induced by competing interest groups that has been well-described by analysts like Andy Xie and Michael Pettis. We have previously noted our belief that China's growing nationalism and aggressive military actions are a direct

ISSN 1554-5075

result of its growing domestic legitimacy crisis. This theme has also been the subject of an increasing number of recent articles, including "The Remilitarization of Beijing" by Gordon Chang in the 21Sep10 edition of *The Diplomat*, "China's Muscle Flexing is a Sign of Weakness" by David Holslag in the 27Sep10 *Financial Times*, "A Recipe for Trouble in China's Backyard" by David Pilling in the 29Sep10 *Financial Times*, and Gillian Tett's brief review of how economic and political crises led to the radicalization of Japan in the 1930s ("A Cautionary Tale About Exit Strategies from 1930s Japan" in the 2Sep10 *Financial Times*).

In our view, the most likely short-term consequence of the legitimacy crises that are developing around the world will be a change in the nature of the institutions governing the international monetary and trade systems. That these are under great pressure today is undeniable. As foreseen by John Maynard Keynes in the 1930s, the great weakness of the current monetary system is that it cannot force adjustment on a country with a large current account surplus and rapidly growing foreign exchange reserves that is intervening to keep its exchange rate artificially low, and in so doing sapping both aggregate demand and employment from its trading partners. Commentators such as the *Financial Times'* Martin Wolf have repeatedly noted that this description perfectly fits China today, that current trends cannot continue indefinitely, and that there is a rapidly rising probability that they will end badly. For example, Brazil's Finance Minister, Guido Mantega, recently declared that "we are in the midst of an international currency war, a general weakening of the currency [that] threatens us because it takes away our competitiveness" in a world where governments are competing to reduce their exchange rates in order to boost export sales to avoid the need for austerity in a world of high leverage and weak aggregate demand. As Martin Wolf notes in "Currencies Clash in a New Age of Beggar-My-Neighbor" (*Financial Times*, 28Sep10), today "we are seeing a form of monetary warfare: in effect, the U.S. is seeking to inflate China, and China to deflate the U.S. Both sides are convinced they are right; neither is succeeding; and the rest of the world suffers." In a recent column, Robert Samuelson writes about where this process is likely to lead ("Risking a Trade War With China" *realclearpolitics.com*, 27Sep10),

ISSN 1554-5075

noting that "the trouble is that China has never genuinely accepted the basic rules governing the world economy. China follows those rules when they suit its interests and rejects, modifies, or ignores them when they don't…Most other countries support the legitimacy of the rules" even when that requires short term sacrifices on their part. Samuelson continues, "the post-World War Two trading system was build on the principle of mutual advantage, and that principle, though often compromised, has endured. China wants a trading system subordinated to its needs: ample export markets to support the jobs necessary to keep the Communist Party in power; captive sources for oil, foodstuffs and other essential raw materials; and technological superiority. Other countries win or lose, depending on how well they serve China's interests. The collision is between two concepts of world order. As the old order's main architect and guardian, the United States faces a dreadful choice: resist Chinese ambitions and risk a trade war in which everyone loses; or do nothing and let China remake the trading system. The first would be dangerous; the second, potentially disastrous."

Samuelson isn't alone in these thoughts. The growing legitimacy crisis for the international monetary and trade system was also the subject of a recent report from the U.S. National Intelligence Council, titled "Global Governance 2025: At a Critical Juncture". It begins by noting that while on the one hand, "the effects of rapid globalization are driving demands for more effective global governance," on the other hand, "the gap between increasing disorder and weakening governance structures is widening." The report describes four scenarios for the possible future outcomes of these trends:

- "**Scenario 1: Barely Keeping Afloat**. In this scenario, seen as the most likely one over the next several years, no one crisis will be so overwhelming as to threaten the international system…Crises are dealt with ad hoc, and temporary frameworks or institutions are devised to avert the most threatening aspects of them…Formal institutions remain unreformed…This

ISSN 1554-5075

future is not sustainable over the longer term, as it depends on no crisis being so unmanageable as to overwhelm the international system."

- "**Scenario 2: Fragmentation**. Powerful states and regions try to wall themselves off from outside threats. Asia builds a regional order that is economically self-sufficient. Global communications ensure that globalization does not die, but it slows significantly. Europe turns its focus inward as it wrestles with growing discontent and declining living standards…The U.S. might be fiscally constrained if its budgetary shortfalls and long-term debt problems remain unresolved."

- "**Scenario 3: Concert of Europe Redux**. Severe threats to the international system prompt greater cooperation on solving global problems, and significant reform of the international system becomes possible... The U.S. shares power, while China and India increase their burden sharing and the EU takes on a bigger role…Although less likely than the first two scenarios in the immediate future, this scenario might prove the best outcome over the longer term."

- "**Scenario 4: Conflict Trumps Cooperation**. This scenario is among the least likely, but the possibility cannot be dismissed. The international system becomes threatened due to domestic disruptions, particularly in emerging powers such as China. Nationalistic pressures build as middle class aspirations are stymied. Tensions build between the United States and China, but also among some of the BRICs [Brazil, Russia, India, China] as competition grows for scarce resources and clients…Suspicions and tensions make reforming global institutions impossible; budding regional efforts, particularly in Asia, are also undermined."

ISSN 1554-5075

In sum, we see widespread evidence today of an accelerating decline in the perceived legitimacy of the political institutions that govern the behavior of critical aspects of the global economic system. We believe that this legitimacy crisis is most visible today at the international level. However, there is also evidence that domestic legitimacy crises are also building in the United States, China and the European Union. This trend represents a significant source of increased uncertainty for the operation of financial markets and the future returns on different asset classes. For the past few years, our downside scenario has included a return to a world of de facto or de jure blocs, including the Anglosphere nations (possibly allied with Japan, India and Latin America), the Sinosphere, and a greatly weakened Eurozone (with Russia's allegiance an uncertainty, and the Middle East, a battleground, in the absence of a biofuels or vehicle electrification breakthrough). Today, we believe the probability of this scenario developing is higher than it ever has been before. If it does come to pass, there is a high likelihood of increased restrictions on international capital movements. A world of competing blocs would also likely see increased portfolio allocations to real and nominal return government bonds, gold, and perhaps energy vehicles (e.g., stocks and MLPs), commercial property and timber as more investors seek a combination of liquidity and long-term stores of real value. Asset classes more dependent on growth, and especially on global growth, such as commodities and equities, are likely to perform poorly under this scenario (though industries seeing a shift from foreign to domestic production, as well as defense-related stocks, may be the exceptions to this rule). Cross border investments would likely see either increased correlations (within blocs) or declining attractiveness (across blocs).

In sum, while the threats posed by deleveraging, inadequate aggregate demand, and deflation are more visible, it may well be that rising threats to political legitimacy will have the greatest impact on asset class returns over the next five to ten years.

Global Asset Class Valuation Analysis

ISSN 1554-5075

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.

ISSN 1554-5075

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

ISSN 1554-5075

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 31 Aug 10

Australia	**Low Demanded Return**	**High Demanded Return**
High Supplied Return	62%	95%
Low Supplied Return	96%	133%

Canada	**Low Demanded Return**	**High Demanded Return**
High Supplied Return	61%	114%
Low Supplied Return	118%	183%

.

Eurozone	**Low Demanded Return**	**High Demanded Return**
High Supplied Return	40%	75%
Low Supplied Return	72%	112%

.

Japan	**Low Demanded Return**	**High Demanded Return**
High Supplied Return	68%	123%
Low Supplied Return	129%	197%

.

United Kingdom	**Low Demanded Return**	**High Demanded Return**
High Supplied Return	24%	62%
Low Supplied Return	57%	101%

ISSN 1554-5075

.

United States	Low Demanded Return	High Demanded Return
High Supplied Return	60%	119%
Low Supplied Return	125%	200%

Switzerland	Low Demanded Return	High Demanded Return
High Supplied Return	50%	92%
Low Supplied Return	92%	212%

India	Low Demanded Return	High Demanded Return
High Supplied Return	47%	138%
Low Supplied Return	159%	292%

Emerging Markets	Low Demanded Return	High Demanded Return
High Supplied Return	72%	163%
Low Supplied Return	114%	206%

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

ISSN 1554-5075

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.

ISSN 1554-5075

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

ISSN 1554-5075

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* %
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 **31 Aug 10**:

Region	Risk Free Rate Demanded	Actual Risk Free Rate Supplied	Difference	Overvaluation (>100) or Undervaluation (<100)
Australia	2.2	2.4	0.2	98
Canada	2.8	1.2	-1.5	116
Eurozone	2.9	1.2	-1.7	118
Japan	2.8	1.4	-1.4	115
United Kingdom	2.8	0.5	-2.4	127
United States	2.5	1.0	-1.5	116

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

ISSN 1554-5075

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 plus a premium for inflation uncertainty. We use the latter two variables as a proxy for the average rate of inflation likely to prevail over a long period of time. To estimate of the degree of over or undervaluation for a bond market, we use the rate of return supplied and the rate of

ISSN 1554-5075

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 31 Aug 10

	Current Real Rate	Average Inflation (89-03)	Inflation Uncertainty Premium	Required Nominal Return	Nominal Return Supplied (10 year Govt)	Return Shortfall or Excess	Asset Class Over or (Under) Valuation, based on 10 year zero coupon	Implied Annual Inflation Over 10 Year Horizon
Australia	2.37%	2.96%	0.25%	5.58%	4.77%	-0.81%	**7.99%**	2.10%
Canada	1.25%	2.40%	0.25%	3.90%	2.76%	-1.14%	**11.61%**	1.25%
Eurozone	1.19%	2.37%	0.25%	3.81%	2.11%	-1.70%	**17.99%**	0.66%
Japan	1.38%	0.77%	0.25%	2.40%	0.98%	-1.42%	**14.95%**	-0.64%
UK	0.46%	3.17%	0.25%	3.88%	2.83%	-1.05%	**10.67%**	2.11%
USA	1.03%	2.93%	0.25%	4.21%	2.48%	-1.73%	**18.23%**	1.18%
Switzerland	1.28%	2.03%	0.25%	3.56%	1.15%	-2.41%	**26.53%**	-0.38%
India	1.28%	7.57%	0.25%	9.10%	7.96%	-1.14%	**11.08%**	6.35%

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

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

ISSN 1554-5075

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 – e.g., see the recent IMF study, "Fiscal Deficits, Public Debt, and Sovereign Bond Yields" by Baldacci and Kumar). As we like to point out, in the absence of public policy interventions, overindebtedness on the part of private borrowers typically results in widespread bankruptcies and deflation caused by the accelerating liquidation of collateral. In contrast, overindebtedness on the part of governments more often results in some combination of inflation and exchange rate depreciation (e.g., look at the history of Argentina, which we know all too well).

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

The second piece of information that can help to put our government bond valuation analysis into a larger context is presented in the following table. It shows

historical average inflation rates (and their standard deviations) for the U.K. and U.S. over very long periods of time:

	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

ISSN 1554-5075

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 **31 Aug 10**, the AAA minus 10 year Treasury spread was 1.78%. The AAA minus BAA spread was 1.22%. Since the distributions of AAA and BAA credit spreads are not normal (i.e., they do not have a "bell curve" shape), we need to look at history rather than Gaussian (normal curve) statistics to put them into perspective. Over the past twenty-four years, 13.2% of all trading days had a higher AAA-Treasury spread. Over the same period, 17.7% of all trading days had a higher AAA-BBB spread.

Over a longer-term time horizon, when liquidity and credit risk premiums would be expected to return to their historical averages, one can argue that credit is underpriced today, given high prevailing yields (i.e, falling bond yields mean rising bond prices). However, the validity of that conclusion critically depends on one's assumptions about future default rates and loss rates conditional upon default. A decision to buy 50,000 in bonds at what appears to be a very attractive yield from a long-term perspective can still generate negative total returns if the future default rate (and losses conditional upon default) more than wipes out the apparently attractive extra yield. And since the differences between current AAA and BBB spreads and

ISSN 1554-5075

their long-term averages (1.24% and .98%, respectively) are well under 100 basis points today, it doesn't take much mis-estimation of future default rates (and/or losses conditional on default) to turn today's apparently good decision into tomorrow's painful outcome. And the "historically attractive yields" argument gets (non-linearly) less convincing the further down the credit ratings ladder you go. On balance, we think that even on a long-term view, credit likely overpriced today, given the increasingly uncertain economic outlook and difficulty in accurately estimating future default and loss given default rates.

Currencies

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

In our case, we have taken the difference between the yields on ten-year government bonds as our estimate of the likely future annual change in exchange rates between two regions. According to theory, the currency with the relatively higher interest rates should depreciate versus the currency with the lower interest rates. Of course, in the short term this often doesn't happen, which is the premise of the popular hedge fund "carry trade" strategy of borrowing in low interest rate currencies, investing in high interest rate currencies, and, essentially, betting that the change in exchange rates over the holding period for the trade won't eliminate the potential profit. Because (as noted in our June 2007 issue) there are some important players in the foreign exchange markets who are not profit maximizers, carry trades are often profitable, at least over short time horizons (for an excellent analysis of the sources of carry trade

ISSN 1554-5075

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 31 Aug 10

	To AUD	To CAD	To EUR	To JPY	To GBP	To USD	To CHF	To INR
From								
AUD	0.00%	-2.01%	-2.66%	-3.79%	-1.94%	-2.29%	-3.62%	3.19%
CAD	2.01%	0.00%	-0.65%	-1.78%	0.07%	-0.28%	-1.61%	5.20%
EUR	2.66%	0.65%	0.00%	-1.13%	0.72%	0.37%	-0.96%	5.85%
JPY	3.79%	1.78%	1.13%	0.00%	1.85%	1.50%	0.17%	6.98%
GBP	1.94%	-0.07%	-0.72%	-1.85%	0.00%	-0.35%	-1.68%	5.13%
USD	2.29%	0.28%	-0.37%	-1.50%	0.35%	0.00%	-1.33%	5.48%
CHF	3.62%	1.61%	0.96%	-0.17%	1.68%	1.33%	0.00%	6.81%
INR	-3.19%	-5.20%	-5.85%	-6.98%	-5.13%	-5.48%	-6.81%	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

ISSN 1554-5075

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 **31 Aug 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	6.1%	0.2%	6.3%	2.4%	3.0%	5.4%	85%
Canada	4.9%	0.2%	5.1%	1.2%	3.0%	4.2%	82%
Eurozone	5.4%	0.2%	5.6%	1.2%	3.0%	4.2%	74%
Japan	7.9%	0.2%	8.1%	1.4%	3.0%	4.4%	53%
Switzerland*	3.2%	0.2%	3.4%	1.3%	3.0%	4.3%	127%

ISSN 1554-5075

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)
U.K.	5.0%	0.2%	5.2%	0.5%	3.0%	3.5%	65%
U.S.A.	4.2%	0.2%	4.4%	1.0%	3.0%	4.0%	91%

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

As you can see, on a long-term view, a number of commercial property markets still look underpriced today, despite the sharp recent increase in property share prices in many countries. Over the next twelve months, however, we believe the balance of risks points in the other direction. Consumer spending remains weak in many markets, occupancy rates are declining, rents are stagnant at best, and landlords continue to struggle with debt refinancings (indeed, the press is full of stories about the declining quality of commercial mortgage backed securities). It is hard to see how government fiscal stimulus, strong though it is, will improve this situation very much, as long as the underlying problems – high consumer leverage, a weak financial system, and continuing international imbalances – remain unresolved. Moreover, the development of real return bond and commodity markets has weakened, to some extent, property's traditional attraction as an inflation hedge. While these factors tend to undermine one source of support for property prices, we also recognize that, at least in some markets, they can be offset by property's historical attraction as a means of preserving wealth in very difficult and uncertain times. In sum, we believe that the sharp run up in property security prices in recent months is due to some combination of investor over-optimism about the speed and size of economic recovery, and/or the tendency of institutional investors to herd rather than risk losing assets (or their jobs) due to their underperforming an asset class benchmark. Switzerland and the Eurozone

ISSN 1554-5075

may be exceptions to this view, in that rising uncertainty may have triggered increased demand for property in these markets.

Commodities

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

ISSN 1554-5075

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

ISSN 1554-5075

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

ISSN 1554-5075

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 **31 Aug 10**:

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

ISSN 1554-5075

side shocks. On a weighted basis (using the DJAIG weights), the forward premium (relative to the spot price) at **31 Aug 10** was 1.93%, compared to .22%. one month previously, .54% two months ago, and .74% 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.

ISSN 1554-5075

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

So, to sum up, the expected supply of returns from a commodity index fund over a given period of time equals (1) the current yield on real return bonds, reduced by the percentage of funds used to purchase the futures contracts; (2) expected roll yields, adjusted for commodities' respective weights in the index; (3) unexpected spot price changes; and (4) the expected rebalancing return. Of these, the yield on real return bonds can be observed, and we can conservatively assume a long-term rebalancing return of, for example, 1.0%. These two sources of return are clearly less than the demand for returns that are equal to the real rate plus a risk premium of, say, 3.0%. The difference must be made up by a combination of roll returns (which, given the current shape of futures curves, are likely to be negative in the near term) and unexpected price changes, due to unanticipated changes in demand (where downside surprises currently seem more likely than upside surprises) and/or unanticipated changes in supply conditions (e.g., incomplete investor recognition of slowing oil production from large reservoirs, a major disruption due to war/terrorism or a significant accident, discovery of significant new deposits, or a major breakthrough that makes biofuels much more cost competitive). On balance, at **31 Aug 10**, we believe that returns on many commodity futures are more likely to be negative over the next year than positive; hence, using this analytical framework we conclude that commodities are likely overpriced today, using a one-year time horizon.

Another approach to assessing the valuation of commodities as an asset class is to compare the current value of the DJAIG Index to its long-term average. Between

ISSN 1554-5075

1991 and 2009, the inflation adjusted (i.e., real) DJAIG had an average value of 90.99, with a standard deviation of 15.92 (skewness of .57, and kurtosis of -.07; i.e., it was close to a normal distribution). The inflation adjusted **31 Aug 10** closing value of 81.91 was an estimated .61 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 overpriced today on a medium term view is based on the belief that (a) investment in clean fuels and other changes in environmental regulation will cause a permanent reduction in global demand for oil relative to supply (and oil receives a relatively heavy weight in most commodity indexes); (b) The inability to quickly resolve the economic challenges facing the world economy will result in a prolonged period of weak or no growth (including a major slowdown in Chinese growth), which will reduce the demand for commodities; and (c) That in a scenario of prolonged global stagnation, investors will prefer to increase their holdings of short term government bonds, and perhaps gold, rather than increasing their holdings of a broader range of commodities.

On balance, we believe that, over the next three to five years, a fall in global aggregate demand is more likely than an inflation and/or US Dollar crisis, as the High

ISSN 1554-5075

Uncertainty Regime typically sees a flight into U.S. dollars rather than a flow out of them. On that basis, we conclude that, over this time horizon, commodities are likely overpriced today.

Gold

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

In an article in our January 2010 issue, we described why we would expect the real price of gold to increase by about 1.75% per year under normal conditions. This is the difference between our assumed long-term growth rate of real global GDP of 3.25% per year and our assumed long-term growth rate of the world stock of gold of 1.50% per year. We can further expand our description of the supply of gold returns, viewing 1.75% per year as the normal "income return" from holding gold, and adding to it the change in the price of gold that is driven by regime changes – i.e., changes in perceived uncertainty and expected inflation.

When we looked at the return for holding gold that an investor would logically demand, in terms of a risk premium above the real risk free interest rate, we found that it varied considerably depending on the regime that prevailed. In normal times, the risk premium has been negative (about 2.0% annually), reflecting the fact that gold plays

ISSN 1554-5075

the role of portfolio insurance, for which, in normal times, an investor should logically expect to pay, rather than receive, a risk premium. However, this insurance policy is expected to pay off under the high inflation and high uncertainty regimes, when the risk premium above the real risk free rate turns positive, ranging between 2.5% in the high inflation regime to 2.0% in the high uncertainty regime.

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

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

ISSN 1554-5075

Eventually the system is driven back towards equilibrium, via a sharp decline in the price of gold.

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

At **31 Aug 10**, the yield on a 10-year USD real return bond was 1.03%, and we believe that the chances are high we are out of the normal regime, and into a situation in which most investors expect gold to pay a positive risk premium. So the real return demanded for holding gold should be 3.00% to 3.50% per year. According to our approach, fair valuation of gold would require that the expected supply of real gold returns be of the same magnitude. However, over the last 12 months, the actual real return from holding gold (calculated using the change in the GLD ETF less the change in the US CPI) has been 29.56%.

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.

ISSN 1554-5075

Conditions in the gold futures market further reinforce this view. Over the past few months, gold futures have became much less contangoed, with a recent forward premium (based on the price difference between the two nearest month contracts) of only .02%. While further negative surprises that raise perceived uncertainty could yet drive gold prices higher (the most powerful of which would be increased worries about the creditworthiness of U.S. Treasury securities), we conclude that at present gold is likely overpriced today, based on our fundamental valuation methodology. That said, when the inevitable price decline will occur is anybody's guess.

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

ISSN 1554-5075

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

ISSN 1554-5075

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

ISSN 1554-5075

or conservation easements). For example, if wood prices decline, and non-timber sources of revenue dry up (as is happening during the current recession), a timber REIT (or timber LP) will have to either cut operating costs and/or distributions to investors, or increase the physical volume of trees that are harvested.

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

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

Growth Driver	**Assumption**
Biological growth of trees	We assume 6% as the long term average for a diversified timberland portfolio. We stress that biological growth rates can vary widely for different types of timber investment (with softwoods and timber located in tropical countries delivering the highest growth, and hardwoods and timber in more temperate climates delivering the slowest growth rates). We have also changed our valuation model to assume a constant mix of product grades, to present a better approximation for timber as a global asset class.
Harvesting rate	As a long term average, we assume that 5% of tree volume is harvested each year. As a practical matter, this should vary with

ISSN 1554-5075

Growth Driver	Assumption
	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 CO2 sequestration service they provide (or for timber's use in various biomass energy applications). Again, given the high level of global concern with limiting the increase in atmospheric CO2 levels, we believe this is a conservative assumption.

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

ISSN 1554-5075

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 **31 Aug 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)	4.60%
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	**5.60%**
Real Bond Yield	1.03%
Plus Risk Premium for Timber	3.00%
Equals Average Annual Real Return Demanded	**4.03%**
Ratio of Returns Demanded/Returns Supplied Equals Valuation Ratio (less than 100% implies undervaluation)	**65%**

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

ISSN 1554-5075

class as a whole, timber, as measured by PCL and RYN, is likely overpriced today. On the other hand, whether looking over a short or long-term time horizon, if you believe that future revenues from timber's CO2 sequestration service are likely to be significant, and/or that four percent is too high a risk premium to use, then you could argue that timber is likely underpriced today.

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

Volatility

Our approach to assessing the current value of equity market volatility (as measured by the VIX index, which tracks the level of S&P 500 Index volatility implied by the current pricing of put and call options on this index) is similar to our approach to commodities. Between January 2, 1990 and December 31, 2009, the average daily value of the VIX Index was 20.29 (median 18.77), with a standard deviation of 8.36 (skewness 2.05, kurtosis 7.28 – i.e., a very "non-normal" distribution). On **31 Aug 10**, the VIX closed at 26.05. To put this in perspective, only 18% of the trading days in our sample had higher closing values of the VIX. In sum, at the end of last month, while volatility was high in historical terms, it was still at a level that we believe is inconsistent with the high uncertainty regime that we expect to prevail in global

ISSN 1554-5075

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).

ISSN 1554-5075

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

ISSN 1554-5075

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	***31 Aug 10***			
Economy	Bottoming	Strengthening	Peaking	Weakening
Interest Rates	Falling	Bottom	Rising	Peak
Style and Size Rotation	Small Growth (DSG) **-7.44%**	Small Value (DSV) **-8.69%**	Large Value (ELV) **-2.04%**	Large Growth (ELG) **-4.53%**
Sector Rotation	Cyclicals (RXI) **-2.24%**	Industrials (EXI) **-1.16%**	Staples (KXI) **4.71%**	Utilities (JXI) **7.42%**
Bond Market Rotation	Higher Risk (HYG) **5.21%**	Short Maturity (SHY) **0.85%**	Low Risk (TIP) **2.97%**	Long Maturity (TLT) **13.49%**

Product and Strategy Notes

- Jean-Philippe Bouchaud is one of the most consistently stimulating writers we know when it comes to new insights about financial market dynamics. We were

therefore very excited to see him recently publish an overview article ("The Endogenous Dynamics of Markets: Price Impact and Feedback Loops") that seeks to summarize his thinking over the past few years on this critical issue. Bouchaud reviews the evidence supporting his contention that "the erratic dynamics of markets is to a large extent of endogenous origin – i.e., determine by the trading activity itself, and not due to the rational processing of exogenous news…where the joint fluctuations of order flow and liquidity are the key ingredients" in short term price determination. "Even 'liquid' markets are in fact very illiquid, in the sense that the total volume in the order book available for an immediate transaction is extremely small. The immediate consequence is that the trades of medium to large institutions can only be executed incrementally, explaining the observed correlation in order flow. By the same token, the information motivating these trades (if any) cannot be instantaneously reflected by prices. Prices cannot be in equilibrium, but randomly evolve as the icebergs of latent supply and demand progressively reveal themselves (and possibly evolve with time). This feature is an unavoidable consequence of the fact that sellers and buyers must hide their intentions, while liquidity providers only post small volumes in fear of adverse selection…In sum, the picture of markets we advocate is such that the lion's share of high frequency dynamics is due to fluctuations in order flow." This can result in "a decoupling between prices and fundamental values, at least on short to medium term time scales…Collective effects mediated by imitation or contagion pervade markets and lead to instabilities…Only when prices reach values that are, say, a factor of two away from their fundamental value will mean-reverting effects progressively come into play. In the context of stocks, this only happens on the scale of months to years."

- "Taming Manias: On the Origins, Inevitability, Prediction and Regulation of Bubbles and Crashes" by Satinover and Sornette. Intended to be a chapter in an upcoming book, this is an outstanding overview of the application of complex adaptive systems theory to financial markets. It is filled with insights that are

ISSN 1554-5075

often counterintuitive but nonetheless important. For example, the authors noted that "prediction in complex systems is characterized by another factor that is a challenge to [making them resilient]: A 'correct' prediction widely shared leads to widespread common action that alters the predicted result and may make most such 'correct' predictions wrong…Because winning strategies get progressively adopted by the majority [giving rise to momentum profits], they are bound to fail."

- A third recent paper we found very interesting is "Human Judgment is Heavy Tailed: Empirical Evidence and Implications for the Aggregation of Estimates and Forecasts" by Lobo and Yao of INSEAD. The authors examine the assumption that errors in human judgment tasks are normally distributed and find evidence that they are not, and instead that the distributions of errors has fat tails. They note that "this has important implications for the aggregation of expert estimates and forecasts" and propose a simple heuristic to improve the accuracy of forecast combinations: Add the average of the forecasts to the median of the forecasts, and divide by two.
- Last but not least, we couldn't resist reading a paper with the title "Are You Smarter than a CFA'er? Manager Qualifications and Portfolio Performance" (by Dincer, Gregory-Allen, and Shawky). After a thorough examination of a range of previous studies on this issue, they could "find no significant different in the returns attributable to MBA, CFO or Experience, but, more significantly, we find that on average, CFAs reduce and MBAs increase portfolio risk."

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

ISSN 1554-5075

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

ISSN 1554-5075