The Index Investor

Invest Wisely…Get an Impartial Second Opinion.

Contents

February 2009 Issue: Key Points

This month's feature article summarizes the key points from three important (and largely overlooked) recent papers: (1) "Joint Operating Environment 2008" published by the U.S. Joint Forces Command; (2) "Global Trends 2025" by the U.S. National Intelligence Council; and (3) an article on the implications of the current crisis, by Walter Russell Mead, author of God and Gold: Britain, America and the Making of the Modern World. Taken together, these three analyses paint a sobering picture of the world investors are likely to confront over the next twenty years. From an asset allocation perspective, a number of tentative conclusions seem to emerge from them. First, returns on oil and gas commodities and/or alternative energy companies are likely to be high in the years ahead. Higher levels of uncertainty over the next twenty years should lead to higher than historical returns on asset classes that perform well under such conditions, including short term government bonds, timber, gold, Swiss Francs and equity volatility. Due to demographic trends whose consequences seem politically hard to avoid, returns to labor are likely to rise, and returns to capital are likely to decline in Europe and Japan. This implies lower returns on equity in these

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regions in the future. Rising levels of conflict also seem likely to make emerging market investments a riskier proposition than they have been in the recent past; increased selectivity will be important to generating attractive returns. In this regard, India looks to be a less risky bet than China at this point. Finally, as we have written so many times before, the reports all emphasize the extent to which events in China will have a critical long-term impact on global risk premiums, growth rates, and patterns of trade and investment.

In this month's economic update, we introduce a quantitative framework to help investors anticipate changes between three macroeconomic regimes: high uncertainty, high inflation, and normal times. We also review recent developments that seem to have a high likelihood ratio – that would be much more likely to occur under either our conflict or cooperative scenario. Taken together, the evidence points to a higher probability (compared to last month) that the conflict scenario is developing. This should keep the prices of uncertainty hedges at elevated levels (though we don't believe they offer much additional upside). We also continue to believe that the global economy will eventually transition to a high inflation regime before returning to more normal times. While a few inflation hedging assets have seen price rises, we do not believe that the rising probability of this regime change is fully reflected in current asset class valuations.

Our product and strategy notes cover a wide range of topics this month, including carbon market developments, the impact of the current crisis on investor behavior, the challenges facing private equity funds, research on the impact of testosterone and cortisol on investor behavior, how value investors really make decisions, and the continuing evolution of alpha to beta. We also review a large number of new products, covering volatility, gold, oil, foreign bonds, the new GLADI global fixed income index, and a new uncorrelated alpha arbitrage strategy fund. Finally, we review change we have made in the funds we will use this year in our model portfolios to implement various asset class and alpha strategy allocations.

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This Month's Letters to the Editor

I've found oanda.com to be an excellent site for foreign exchange. They regularly update The Economist's "Big Mac" Index based on current exchange rates to help investors gauge currency over and undervaluation. What do you think of this approach?

The short answer is that we regularly monitor it. The Big Mac Index is a practical implementation of the theory of "purchasing power parity" – the idea that, after adjusting for exchange rates, the same basket of goods should cost the same amount in different countries (i.e., it is a version of the law of one price). PPP has some limitations – for example, not all goods and services can be traded across currency zones (say, the labor required to cook that Big Mac), or there may be costs (e.g., transport and tariffs) that distort relative prices. Still, as a rough guide to the balance of pressure for exchange rate changes it is an excellent theory. We combine it with the theory of covered interest rate parity we use in our asset class valuation update, which says that, in order to eliminate profitable arbitrage opportunities, differences in interest rates on equally risky government bonds should be offset by changes in the underlying exchange rate. As we note each month, while all theories that claim to predict exchange rate changes are practically guaranteed to be wrong in the short-run, they provide a good, if rough, medium term guide to the direction in which the complex adaptive system that comprises the economy and financial markets is likely to evolve in the future.

Did the crisis of 2008 undermine your belief in the virtues of diversification?

Thank you for an excellent and timely question. The short answer is that 2008 did not undermine our belief in diversification; rather, it showed us how we – and the rest of the asset management industry – need to improve our approach to it. Let's start with the following table, which shows a range of investments which delivered positive returns in different currencies in 2008:

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	In USD	In AUD	In CAD	In EUR	In JPY	In GBP	In CHF	In INR
Real Bonds		x		x		x	N/A	N/A
Dom Govt Bonds	x	x	x	x	x	x	x	x
US Govt Bonds	x	x	x	x		x	x	x
Swiss Francs	x	x	x	x		x	N/A	x
Gold	x	x	x	x		x		x
Timber		x	x			x		x
Eq Mkt Neutral		x	x			x		
Volatility	x	x	x	x	x	x	x	x

What failed to work in 2008 was not diversification, but rather many quantitative asset allocation models and qualitative human decision making processes. In essence, in 2008 the world experienced a relatively rare (at least in recent times) regime switch, from a relatively normal regime into one of high uncertainty (with an elevated possibility of deflation). In some ways, this switch was similar to the 2000-2001 popping of the technology bubble in equity markets. Indeed, some of the same signatures are present, including increases in the spread between ten year government bond and AAA corporate bond yields, reflecting elevated liquidity risk. However, the fact that leverage was high and multiple asset classes had become substantially overvalued caused this regime switch to be of a different order of magnitude (alternatively, one could say that while in 2000-2001 we flirted with this regime shift, in 2007-2008 we actually made it).

For many years we have noted two key limitations of many asset allocation methodologies. The first is so-called "model error", which occurs when important risk factors and relationships are not included. Back in 2002, we commented on Kent Obsand's book, Iceberg Risk, which raised this possibility. And in 2008, we very clearly saw that at least two critical factors had been left out of most asset allocation models: systematic liquidity risk, and the tendency of correlations to rise when asset prices are falling (to be sure, there were people like Windham Capital and ourselves who had tried to take the latter risk factor into account). The second limitation of models is "parameter error" which refers to a situation in which a variable is properly included in a model, but given an incorrect value. There is now much discussion in the

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media about how models failed to completely capture so-called "tail" or "rare event" risk, which is poorly measured using just historical returns. Clearly, the assumption of normally distributed returns for most asset classes has been proven conclusively wrong – tails are actually much fatter, and extreme events more likely than many models have assumed. Perhaps most important of all, in 2008 we also saw a widespread reluctance on the part of too many professionals to disagree with their models, even when their instincts may have been screaming that danger lay ahead. This is both an intellectual problem (why were people so reluctant to openly examine and seek to reconcile this growing conflict?) and an organizational one (undoubtedly many people faced incentives that discouraged them from "making waves").

Going forward, the events of 2008, far more so than those of 1987, 1998, and 2001, seem likely to produce wide ranging changes in the investment management profession. On the modeling side, we believe we will see a shift towards regime-shifting models, and asset allocation approaches focused on hedging exposure to different macroeconomic scenarios. Bridgewater, Windham and GMO already seem to be moving in this direction, as are we here at Index Investor. In fewer cases, we may also see more willingness to adopt disequilibrium approaches like adaptive markets, which enable you to take overvaluation into account without feeling you are betraying your intellectual heritage. Parameter estimation errors will also receive much explicit attention, with greater use of techniques like shrinkage estimators and non-normal distributions. Undoubtedly, the result will be better models, and, we hope, greater willingness to openly recognize and examine apparent conflicts between models' recommendations and investors' common sense. The willingness to do this would also be helped by a shift in the ranking of investors' goals – with less focus on outperforming index benchmarks and peers, more on risk adjusted outperformance of internal liability driven benchmarks (e.g., are we on track to achieve our retirement income goals), and greater willingness to risk underperformance during uncertain times in order to maximize preservation of capital.

We are not exempt from this process, even though we avoided some of the biggest mistakes that were made in the run-up to the 2008 crisis. For example, as we

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have noted before, we are reevaluating the role of credit versus government bonds, and of assets like gold (see this month's Product and Strategy Notes) and Swiss Francs that have delivered positive returns during the high uncertainty regime. So, to reiterate our initial answer, we have not lost our faith in diversification; rather our challenge is to learn from experience and adapt our approach to achieving it.

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Global Asset Class Returns

YTD 30Jan09	In USD	In AUD	In CAD	In EURO	In JPY	In GBP	In CHF	In INR
Asset Held								
US Bonds	-0.72%	8.07%	-0.29%	7.09%	-1.66%	-0.99%	7.58%	-0.39%
US Prop	-17.39%	-8.60%	-16.96%	-9.58%	-18.33%	-17.66%	-9.09%	-17.06%
US Equity	-8.26%	0.53%	-7.83%	-0.45%	-9.20%	-8.53%	0.04%	-7.93%
AUS Bonds	-9.18%	-0.38%	-8.74%	-1.36%	-10.12%	-9.45%	-0.87%	-8.85%
AUS Prop	-8.79%	0.00%	-8.36%	-0.98%	-9.74%	-9.06%	-0.49%	-8.47%
AUS Equity	-17.13%	-8.34%	-16.70%	-9.32%	-18.07%	-17.40%	-8.83%	-16.80%
CAN Bonds	-2.01%	6.78%	-1.58%	5.80%	-2.95%	-2.28%	6.29%	-1.68%
CAN Prop	-0.92%	7.87%	-0.49%	6.89%	-1.86%	-1.19%	7.38%	-0.59%
CAN Equity	-4.19%	4.60%	-3.76%	3.62%	-5.13%	-4.46%	4.11%	-3.86%
Euro Bonds	-11.24%	-2.45%	-10.81%	-3.43%	-12.19%	-11.51%	-2.94%	-10.92%
Euro Prop.	-7.44%	1.35%	-7.01%	0.37%	-8.38%	-7.71%	0.86%	-7.11%
Euro Equity	-58.59%	-49.80%	-58.16%	-50.78%	-59.53%	-58.86%	-50.29%	-58.27%
Japan Bnds	-0.14%	8.65%	0.29%	7.67%	-1.08%	-0.41%	8.16%	0.19%
Japan Prop	-10.53%	-1.74%	-10.10%	-2.72%	-11.47%	-10.80%	-2.23%	-10.20%
Japan Eqty	-12.00%	-3.21%	-11.57%	-4.19%	-12.95%	-12.28%	-3.70%	-11.68%
UK Bonds	-4.46%	4.33%	-4.03%	3.35%	-5.40%	-4.73%	3.84%	-4.13%
UK Prop.	-21.95%	-13.16%	-21.52%	-14.14%	-22.89%	-22.22%	-13.65%	-21.62%
UK Equity	-9.39%	-0.60%	-8.96%	-1.58%	-10.33%	-9.66%	-1.09%	-9.06%
World Bnds	-2.46%	6.34%	-2.02%	5.36%	-3.40%	-2.73%	5.85%	-2.13%
World Prop.	-17.60%	-8.81%	-17.17%	-9.79%	-18.54%	-17.87%	-9.30%	-17.27%
World Eqty	-10.86%	-2.06%	-10.42%	-3.04%	-11.80%	-11.13%	-2.55%	-10.53%
Commod	-1.04%	7.76%	-0.60%	6.78%	-1.98%	-1.31%	7.27%	-0.71%
Timber	-14.76%	-5.96%	-14.32%	-6.94%	-15.70%	-15.03%	-6.45%	-14.43%
Uncor Alpha	-1.10%	7.70%	-0.66%	6.72%	-2.04%	-1.37%	7.21%	-0.77%
Volatility	12.10%	20.89%	12.53%	19.91%	11.16%	11.83%	20.40%	12.43%
Currency								
AUD	-8.79%	0.00%	-8.36%	-0.98%	-9.74%	-9.06%	-0.49%	-8.47%
CAD	-0.43%	8.36%	0.00%	7.38%	-1.37%	-0.70%	7.87%	-0.11%
EUR	-7.81%	0.98%	-7.38%	0.00%	-8.76%	-8.08%	0.49%	-7.49%
JPY	0.94%	9.74%	1.37%	8.76%	0.00%	0.67%	9.25%	1.27%
GBP	0.27%	9.06%	0.70%	8.08%	-0.67%	0.00%	8.57%	0.60%
USD	0.00%	8.79%	0.43%	7.81%	-0.94%	-0.27%	8.30%	0.33%
CHF	-8.30%	0.49%	-7.87%	-0.49%	-9.25%	-8.57%	0.00%	-7.98%
INR	-0.33%	8.47%	0.11%	7.49%	-1.27%	-0.60%	7.98%	0.00%

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Uncorrelated Alpha Strategies Detail

YTD 30Jan2009	**In USD**	**In AUD**	**In CAD**	**In EURO**	**In JPY**	**In GBP**	**In CHF**	**In INR**
Strategy								
Eq Mkt Neutral								
HSKAX	1.22%	10.01%	1.65%	9.03%	0.28%	0.95%	9.52%	1.55%
OGNAX	0.30%	9.09%	0.73%	8.11%	-0.64%	0.03%	8.60%	0.62%
Arbitrage								
ARBFX	0.93%	9.72%	1.36%	8.74%	-0.01%	0.66%	9.23%	1.26%
ADANX	0.50%	9.29%	0.93%	8.31%	-0.44%	0.23%	8.80%	0.83%
Currency								
DBV	-5.05%	3.75%	-4.61%	2.77%	-5.99%	-5.32%	3.26%	-4.72%
ICI	-0.85%	7.94%	-0.42%	6.96%	-1.79%	-1.12%	7.45%	-0.52%
Equity L/S								
HSGFX	0.25%	9.04%	0.68%	8.06%	-0.70%	-0.03%	8.55%	0.57%
PTFAX	-0.66%	8.13%	-0.23%	7.15%	-1.60%	-0.93%	7.64%	-0.33%
GTAA								
MDLOX	-4.21%	4.58%	-3.78%	3.60%	-5.15%	-4.48%	4.09%	-3.88%
PASAX	-3.39%	5.41%	-2.95%	4.43%	-4.33%	-3.66%	4.92%	-3.06%

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Asset Class Valuation Update

Our market 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 undervaluation. The attraction of the system to equilibrium means that, at some point, these situations are likely to reverse. However, the complex adaptive nature of the system means that it is difficult if not impossible to accurately forecast how and when such reversals will occur. Yet that does not mean that valuation analyses are a fruitless enterprise. 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 materially increase the probability that they will achieve their long term goals.

We also believe that the use of a consistent quantitative approach to assessing 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 become more extreme or reverse.

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. As described in our November 2008 article “Are Emerging Market Equities Undervalued?”, people can and

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

Equity Market Valuation Analysis at 30 January 2009

Australia	**Low Demanded Return**	**High Demanded Return**
High Supplied Return	34%	54%
Low Supplied Return	51%	72%

Canada	**Low Demanded Return**	**High Demanded Return**
High Supplied Return	74%	112%
Low Supplied Return	116%	161%

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Eurozone	Low Demanded Return	High Demanded Return
High Supplied Return	39%	59%
Low Supplied Return	57%	79%

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Japan	Low Demanded Return	High Demanded Return
High Supplied Return	92%	134%
Low Supplied Return	141%	191%

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United Kingdom	Low Demanded Return	High Demanded Return
High Supplied Return	29%	57%
Low Supplied Return	53%	84%

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United States	Low Demanded Return	High Demanded Return
High Supplied Return	78%	120%
Low Supplied Return	125%	175%

Switzerland	Low Demanded Return	High Demanded Return
High Supplied Return	52%	80%
Low Supplied Return	79%	171%

India	Low Demanded Return	High Demanded Return
High Supplied Return	68%	129%
Low Supplied Return	138%	216%

Emerging Markets	Low Demanded Return	High Demanded Return
High Supplied Return	69%	120%
Low Supplied Return	92%	144%

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In our view, the key point to keep in mind with respect to equity market valuations is the level of the current dividend yield, which history has shown to be the key driver of long-term real equity returns in most markets. The recent rise in uncertainty has 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 has been a sharp fall in equity prices that has 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, this increase in dividend yields has more than offset the simultaneous rise in real bond yields, and caused at least some equity markets to appear undervalued.

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

Bond Market Analysis as of 30 Jan 09

	Current Real Rate*	Average Inflation Premium (89-03)	Required Nominal Return	Nominal Return Supplied (10 year Govt)	Return Gap	Asset Class Over or (Under) Valuation, based on 10 year zero
Australia	2.17%	2.96%	5.13%	4.12%	-1.01%	10.12%
Canada	2.35%	2.40%	4.75%	3.03%	-1.72%	18.01%
Eurozone	2.40%	2.37%	4.77%	3.31%	-1.46%	15.01%
Japan	2.78%	0.77%	3.55%	1.29%	-2.26%	24.72%

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	Current Real Rate*	Average Inflation Premium (89-03)	Required Nominal Return	Nominal Return Supplied (10 year Govt)	Return Gap	Asset Class Over or (Under) Valuation, based on 10 year zero
UK	1.08%	3.17%	4.25%	3.71%	-0.54%	5.33%
USA	2.30%	2.93%	5.23%	2.84%	-2.39%	25.83%
Switz.	2.18%	2.03%	4.21%	2.23%	-1.98%	21.14%
India	2.18%	7.57%	9.75%	6.56%	-3.19%	34.30%

*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. This may not produce an accurate valuation estimate, if the historical average level of inflation is not a good predictor of future average inflation levels. The following table, which shows historical average inflation rates (and their standard deviations) for the U.K. and U.S. over longer periods of time than the ones we have used, helps to put the possible size of any estimation and valuation errors into context:

	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%

If future inflation is expected to be lower than the inflation assumption we have used in our valuation analysis, then required returns should be lower. All else being equal, this would reduce any estimated overvaluation. In this regard, the difference between yields on ten year U.S. government nominal and inflation linked bonds is about one percent, is a rough proxy for the expected future rate of inflation (we say rough because it technically includes not only the expected inflation rate, but also a

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further premium for inflation risk). This value is currently well below the average historical rate of inflation we have used in our analysis.

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

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Risk Averse are Fund Manager?" by Thomas Flavin). The following table brings these factors together to determine our estimate of the risk free rate investors in different currency zones should logically demand in equilibrium (for an excellent discussion of the issues noted above, and their practical importance, see "The Stern Review of the Economics of Climate Change" by Martin Weitzman):

Region	Labor Force Growth %	TFP Growth %	Steady State Econ Growth %	Std Dev of Econ Growth Rate %	Time Preference %	Risk Aversion Factor	Risk Free Rate Demanded* %
Australia	1.0	1.20	2.2	1.1	2.0	3.0	3.2
Canada	0.8	1.00	1.8	0.9	2.0	3.0	3.8
Eurozone	0.4	1.20	1.6	0.8	2.0	3.0	3.9
Japan	-0.3	1.20	0.9	0.5	2.0	3.0	3.8
United Kingdom	0.5	1.20	1.7	0.9	2.0	3.0	3.8
United States	0.8	1.20	2.0	1.0	2.0	3.0	3.5

- 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 values 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:

Region	Risk Free Rate Demanded	Actual Risk Free Rate Supplied	Difference
Australia	3.2	2.2	-1.0
Canada	3.8	2.4	-1.4
Eurozone	3.9	2.4	-1.5
Japan	3.8	2.8	-1.0
United Kingdom	3.8	1.1	-2.8
United States	3.5	2.3	-1.2

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We reiterate that this analysis is based on a medium term view of the logical value of the risk free real return investors should demand. For example, plunging consumer spending around the world implies a lower time preference rate than the 2.0% we have used in our analysis, which would reduce the apparent overvaluation of this asset class over a shorter term time horizon.

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 may primarily reflect 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 may tell us more about the level of compensation required by investors for bearing relatively high quality credit risk. For example, between August and October, 1998 (around the time of the Russian debt default and Long Term Capital Management crises), the AAA-Treasury spread jumped from 1.18% to 1.84%, while the BAA-AAA spread increased by much less, from .62% to .81%. This could be read as an indication of investor's higher concern with respect to the systematic risk implications of these crises (i.e., their potential to shift the financial markets into the low return, high volatility regime), and lesser concern with respect to their impact on the overall pricing of credit risk.

The following table shows the statistics of the distribution of these spreads between January, 1986 and December, 2008 (based on daily Federal Reserve data – 11,642 data points):

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

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At **30 January 2009**, the AAA minus 10 year Treasury spread was 2.48%. The AAA minus BAA spread was 2.93%. Since these distributions are not normal (i.e., they do not have a "bell curve" shape), we will take a different approach to putting them in perspective. Over the past twenty three years, there have been only 75 days with a higher AAA spread (.64% of all days) and 37 days with a higher BAA spread (.37%). Clearly, current spreads reflect severe investor uncertainty about both liquidity and credit risk. However, given the unchartered economic waters through which we are now passing, it is not clear to us whether these spreads represent the over or undervaluation of liquidity and credit risk.

Let us now turn to currency 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. 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. Our expected medium to long-term changes in exchange rates are summarized in the following table:

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Annual Exchange Rate Changes Implied by Bond Market Yields on 30Jan09

	To AUD	To CAD	To EUR	To JPY	To GBP	To USD	To CHF	To INR
From								
AUD	0.00%	-1.09%	-0.81%	-2.83%	-0.41%	-1.28%	-1.89%	2.44%
CAD	1.09%	0.00%	0.28%	-1.74%	0.68%	-0.19%	-0.80%	3.53%
EUR	0.81%	-0.28%	0.00%	-2.02%	0.40%	-0.47%	-1.08%	3.25%
JPY	2.83%	1.74%	2.02%	0.00%	2.42%	1.55%	0.94%	5.27%
GBP	0.41%	-0.68%	-0.40%	-2.42%	0.00%	-0.87%	-1.48%	2.85%
USD	1.28%	0.19%	0.47%	-1.55%	0.87%	0.00%	-0.61%	3.72%
CHF	1.89%	0.80%	1.08%	-0.94%	1.48%	0.61%	0.00%	4.33%
INR	-2.44%	-3.53%	-3.25%	-5.27%	-2.85%	-3.72%	-4.33%	0.00%

Our approach to valuing commercial property securities as an asset class is also based on the expected supply of and demand for returns. As with equities, the supply of returns equals the current dividend yield 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 rapid increases in rent attracting new property investors, finance the construction of new space which, when it comes onto the market, causes rents to fall. Our analysis also assumes that over the long-term, investors require a 2.5% 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 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

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undervaluations we identify to be reversed. The following table shows the results of this month's valuation analysis:

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	11.8%	0.2%	12.0%	2.2%	2.5%	4.7%	37.8%
Canada	12.5%	0.2%	12.7%	2.4%	2.5%	4.9%	37.1%
Eurozone	9.3%	0.2%	9.5%	2.4%	2.5%	4.9%	50.4%
Japan	7.2%	0.2%	7.4%	2.8%	2.5%	5.3%	70.4%
Switzerland	1.6%	0.2%	1.8%	2.2%	2.5%	4.7%	279.4%
U.K.	9.4%	0.2%	9.6%	1.1%	2.5%	3.6%	35.9%
United States	9.6%	0.2%	9.8%	2.3%	2.5%	4.8%	47.8%

Let us now turn to the Dow Jones AIG 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, over and undervaluations of different degrees 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

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

The general form of the supply of returns an asset class is expected to generate in the future is its current yield (e.g., the dividend yield on equities), plus the rate at which this stream of income is expected to grow in the future. The key challenge with applying this framework to commodities is that the supply of commodity returns doesn't obviously fit into this framework. Broadly speaking, the supply of returns from an investment in commodity index futures comes from four sources. Since commodity index funds are fully collateralized investments, the first source of return is the yield on the cash that is received by the fund by not used to purchase commodity futures (which can be bought for a fraction of their face value). We conservatively assume that about 20% of funds are used to purchase futures, and 80% is invested in real return bonds.

The second source of return 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

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

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

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marginal supplies are more expensive to develop and generally have long lead times), it is not clear that historical tendencies toward backwardation or contango are a good guide to future conditions. To the extent that any generalizations can be made, higher real option values, and hence backwardation and positive roll returns are more likely to be found when demand is strong and supplies are tight, and/or when there is a rising probability of a supply disruption in a commodity where storage is difficult. For example, ten commodities make up roughly 75% of the value of the Dow Jones AIG Commodities Index. The current term structures of their futures curves are as follows:

Commodity	**2009 DJAIG Weight**	**Current Status**
Crude Oil	13.8%	Contango
Natural Gas	11.9%	Contango
Gold	7.9%	Contango
Soybeans	7.6%	Contango
Copper	7.3%	Contango
Aluminum	7.0%	Contango
Corn	5.7%	Contango
Wheat	4.8%	Contango
Live Cattle	4.3%	Contango
Unleaded Gasoline	3.7%	Contango
	74.0%	

Given the prevalence of contangoed futures curves, roll returns on the DJAIG should be negative, absent major supply side shocks.

The third source of commodity futures return is unexpected changes in the price of the commodity during the term of the futures contract. It is important to stress that the market's consensus about the expected change in the spot price is already included in the futures price. The source of return we are referring to here is the unexpected portion of the actual change. Again, large surprises seem more likely when supply and demand and finely balanced – the same conditions which can also give rise to changes in real option values and positive roll returns. At the present time, with economic growth weakening, demand is falling across a wide range of commodities. Hence, the source of any surprising price increases must be a changes

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in expected supply that either occur suddenly and are extremely hard to forecast (e.g., a weather or terrorist related incident) or changes that investors may have not yet fully incorporated into their valuation models (e.g., the faster than expected decline in oil production from current reservoirs). This return driver probably offers investors the best chance of making profitable forecasts, since most human beings find it extremely difficult to accurately understand situations where cause and effect are significantly separated in time (e.g., failure to recognize how fast rising house prices would – albeit with a time delay – trigger an enormous increase in new supply).

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

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

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slowing oil production from large reservoirs and/or the medium term impact of the current sharp cutback in E&P and refining investments).

Another approach to assessing the valuation of commodities as an asset class is to compare the current value of the DJAIG Index to its long-term average. Between 1991 and 2008, the inflation adjusted (i.e., real) DJAIG had an average value of 91.61, with a standard deviation of 16.0 (skewness of .52, and kurtosis of -.13). The inflation adjusted 30 January 2009 closing value of 71.44 was 1.26 standard deviation below the long term average. Assuming the value of the index is normally distributed around its historical average, a value within one standard deviation of the average should occur about 67% of the time, and a value within two standard deviations 95% of the time. Whether the current level of the inflation adjusted DJAIG signifies that commodities are undervalued depends upon one's outlook for future roll returns and price surprises. While short term developments remain highly uncertain, on a medium term view, we believe that commodities are likely undervalued today.

Our approach to assessing the current valuation of timber is based on two publicly traded timber REITS: Plum Creek (PCL) and Rayonier (RYN). As in the case of equities, we compare the return these 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). Two of these variables are published: the dividend yields on the timber REITS and the yield on real return bonds. The other two variables have to be estimated, which presents a particularly difficult challenge with respect to the rate at which dividends will grow in the future.

In broad terms, the rate of dividend growth results from the interaction of physical, and economic processes. In the first part of the physical process, 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). In the second part of

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the physical process, a certain amount of trees are harvested each year, and sold to provide revenue to the timber REIT. In the economic area, three processes are important, 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 increased value 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. The second economic process (or, more accurately, processes) is the interaction of supply and demand that determines changes in real prices for pulpwood, sawtimber and other forest products. 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, which is further broken down into hardwood and softwood. The average annual change in real prices (derived by adjusting the IMF series for changes in U.S. inflation) between 1981 and 2007 are shown in the following table:

	Average	**Standard Deviation**
Hardwood	0.4%	11.8%
Softwood	1.7%	21.6%
All Timber	0.1%	9.2%

As you can see, over the long term, prices have been quite stable in real terms, though with a high degree of volatility from year to year (and additional volatility across different regional markets). The final economic process that affects the growth rate of

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dividends is changes in the REIT's cost structure, and non-timber related revenue streams (e.g., from selling timber land for real estate development). With respect to the latter, the potential imposition of carbon taxes or cap and trade systems for carbon emissions could provide a new source of revenue for timber REITs in the future.

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.
Harvesting rate	As a long term average, we assume that 5% of tree volume is harvested each year.
In-growth of trees	We assume this adds 3% per year to the value of timber assets, assuming no change in the real price of pulpwood, sawtimber and other final products.
Change in prices of timber products	We assume that over the long term prices will just keep pace with inflation. However, 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 our assumption is conservative.
Carbon credits	We assume no additional return from this potential source of value, which also appears to be conservative given forests' role in CO2 absorption.

This leaves the question of the appropriate return premium to assume for the overall 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, we have used four percent as the required return premium for investing in liquid timberland assets. Arguably, this may

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still be too high, as timber is an asset class whose return generating process (being partially biologically driven) has a low correlation with returns on other asset class. Hence, it should provide strong diversification benefits to a portfolio when they are most needed, and investors should therefore require a relatively low risk premium to hold this asset class.

Given these assumptions, our assessment of the valuation of the timber asset class at **30 January 2009** is as follows:

Average Dividend Yield	6.00%
Plus Long Term Annual Biological Growth	6.00%
Less Percent of Physical Timber Stock Harvested Each Year	(5.00%)
Plus Average Annual Increase in Stock Value due to In-growth	3.00%
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	**10.00%**
Real Bond Yield	2.30%
Plus Risk Premium for Timber	4.00%
Equals Average Annual Real Return Demanded	**6.30%**
Ratio of Returns Demanded/Returns Supplied Equals Valuation Ratio (less than 100% implies undervaluation)	**37%**

Our approach to assessing the current value of equity market volatility (as measured by the VIX index, which tracks the level of S&P 500 Index volatility implied by the current pricing of put and call options on this index) is similar to our approach to commodities. Between January 2, 1990 and December 30, 2008, the average daily value of the VIX Index was 19.70, with a standard deviation of 7.88 (skewness 2.28, kurtosis 9.71). To put this in perspective, only 62 days, or 1.29% of our sample had higher closing values of the VIX. However, this high level of implied volatility seems in

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line with the equally high degree of uncertainty that still exists in financial markets and the world economy. As a result, it is hard to say whether volatility is substantially under or overvalued today.

Sector and Style Rotation Watch

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

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

We publish this table to make an important point: there is nothing unique about the various rotation strategies we describe, which are widely known by many investors. Rather, whatever active management returns (also known as "alpha") they are able to generate is directly related to how accurately (and consistently) one can forecast the turning points in the economic cycle. Regularly getting this right is beyond

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the skills of most investors. In other words, most of us are better off just getting our asset allocations right, rather than trying to earn extra returns by accurately forecasting the ups and downs of different sub-segments of the U.S. equity and debt markets (for three good papers on rotation strategies, see "Sector Rotation Over Business Cycles" by Stangl, Jacobsen and Visaltanachoti; "Can Exchange Traded Funds Be Used to Exploit Industry Momentum?" by Swinkels and Tjong-A-Tjoe; and "Mutual Fund Industry Selection and Persistence" by Busse and Tong).

That being said, the highest rolling three month returns in the table do provide us with a rough indication of how investors expect the economy and interest rates to perform in the near future. *The highest returns in a given row indicate that a plurality of investors (as measured by the value of the assets they manage) are anticipating the economic and interest rate conditions noted at the top of the next column* (e.g., if long maturity bonds have the highest year to date returns, a plurality of bond investor opinion expects rates to fall in the near future). Comparing returns across strategies provides a rough indication of the extent of agreement (or disagreement) investors about the most likely upcoming changes in the state of the economy. When the rolling returns on different strategies indicate different conclusions about the most likely direction in which the economy is headed, we place the greatest weight on bond market indicators. Why? We start from a basic difference in the psychology of equity and bond investors. The different risk/return profiles for these two investments produce a different balance of optimism and pessimism. For equities, the downside is limited (in the case of bankruptcy) to the original value of the investment, while the upside is unlimited. This tends to produce an optimistic view of the world. For bonds, the upside is limited to the contracted rate of interest and getting your original investment back (assuming the bonds are held to maturity). In contrast, the downside is significantly greater – complete loss of principal. This tends to produce a more pessimistic (some might say realistic) view of the world (although some might argue that the growth of the credit derivatives market has undermined this discipline). As we have written many times, investors seeking to achieve a funding goal over a multi-year time horizon, avoiding big downside losses is arguably more important than reaching

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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	***30Jan09***			
Economy	Bottoming	Strengthening	Peaking	Weakening
Interest Rates	Falling	Bottom	Rising	Peak
Style and Size Rotation	U.S. Small Growth (DSG) **-12.30%**	U.S. Small Value (DSV) **-17.63%**	U.S. Large Value (ELV) **-16.32%**	U. S. Large Growth (ELG) **-11.47%**
Sector Rotation	Global Cyclicals (RXI) **-15.95%**	Global Industrials (EXI) **-12.99%**	Global Staples (KXI) **-8.28%**	Global Utilities (JXI) **-4.73%**
Bond Market Rotation	Higher Risk (HYG) **7.88%**	Short Maturity (SHY) **1.62%**	Low Risk (TIP) **7.39%**	Long Maturity (TLT) **13.42%**

The following table sums up our conclusions (based on the analysis summarized in this article) as to potential asset class under and overvaluations at the end of **January 2009**. The distinction between possible, likely and probable reflects a rising degree of confidence in our estimate. Finally, we stress that this is an assessment of valuations at a given point in time, which implies no forecast as to whether and when the market's "animal spirits" will cause any over and undervaluations reverse in the future. Bear in mind, that before this reversal occurs, over and undervaluations could actually become more extreme. That said, common sense suggests that more extreme situations are likely to be recognized and reversed more quickly.

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Probably Overvalued	Swiss property
Likely Overvalued	All nominal return government bonds
Possibly Overvalued	All government real return bonds; equity in Canada, India, Japan and US
Possibly Undervalued	
Likely Undervalued	Commodities; equity in Australia, Eurozone and UK; commercial property in Eurozone and US
Probably Undervalued	Timber; commercial property in Australia, Canada and UK

Keeping an Eye on Long Term Trends

While staying abreast of the latest developments in the global economic crisis is undoubtedly important for investors, so too is maintaining a good understanding of longer term trends, and what they may portend for future asset class returns. With that in mind, in this article we will summarize the most interesting observations and conclusions from three recent publications that have received too little attention from the mainstream media.

The first is "Joint Operating Environment 2008." Published by the United States Joint Forces Command, it is "intended to provide a perspective on future trends, shocks, contexts and implications for future joint force commanders and other leaders in the national security field...to serve as a starting point for discussions about the future security environment at the operational level of war." The document begins with an interesting discussion of change and the limits of our ability to predict its course:

- "Thinking about the future requires an understanding of both what is timeless and what will likely change. As Thucydides suggested in the fifth century BC, "the events which happened in the past...(human nature being what it is) will at some time or other and in much the same way be repeated in the future." Many features will not change. The challenges of the future will resemble, in many ways, the challenges that American forces have faced over the past two centuries."

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- [That said}, "the nature of the human condition will also guarantee that uncertainty, ambiguity, and surprise will dominate the course of events. However carefully we think about the future; however thorough our preparations; however coherent and thoughtful our concepts, training and doctrine; we will be surprised.
- "Our goal is not to eliminate surprise – that is impossible. Our goal is, by a careful consideration of the future, to suggest the attributes of a joint force capable of adjusting with a minimum difficulty when the surprise inevitably comes. The true test of military effectiveness in the past has been in the ability of a force to diagnose the conditions it actually confronts and then quickly adapt. In the end, it will be our imagination and agility to envision and prepare for the future, and then to adapt to surprises, that will determine how the Joint Force will perform over the next twenty-five years."
- "Leaders are often late to recognize changes. Driven by an inherent desire to bring order to a disorderly, chaotic universe, human beings tend to frame their thoughts about the future in terms of continuities and extrapolations from the present and occasionally the past. But a brief look at the past quarter century, to say nothing of the past four thousand years, suggests the extent of the changes the coming decades will bring...In thinking about the world's trajectory, we have reason to believe that the next twenty-five years will bring changes just as dramatic, drastic, and disruptive as those that have occurred in the past quarter century."
- "Trends may suggest possibilities and potential directions, but they are unreliable for understanding the future, because they interact with and are influenced by other factors...In consideration of the future, one should not estimate the ability of a few individuals, even a single person, to determine the course of events. One may predict that human beings will act in similar patterns of behavior in the future, but when, where and how remains entirely unpredictable...The interplay of economic trends, vastly different cultures and historical experiences, and the idiosyncrasies of leaders, among a host of other factors, provide such complexity in their interactions as to make prediction impossible. Winston Churchill caught those complexities best in his masterful history of World War I: 'One rises from the study of the causes of the Great

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War with a prevailing sense of the defective control of individuals upon world fortunes. It has been well said, there is always more error than design in human affairs. The limited minds of the ablest men, their disputed authority, the climate of opinion in which they dwell, their transient and partial contributions to the mighty problem, that problem itself, so far beyond their compass, so vast in scale and detail, so changing in its aspects – all this must surely be considered.'"

The JOE then goes on to a discussion of key trends which will combine – usually in unpredictable ways -- to produce what it terms "future contexts":

- "Trend analysis is the most fragile element of forecasting. The world's future over the coming quarter of a century will be subject to enormous disruptions and surprises, natural as well as man-made. These disruptions, and many other forces, can easily change the trajectory of any single trend. [We must also] recognize that many, if not all, of the trends and trajectories of the future will be non-linear...In the final analysis, the value of trends lies not in accurately predicting them, but in intuiting how they might combine in different ways to form more enduring contexts for future operations. Trend analysis can also help in identifying some indicators or signposts that one can use to check the path that the world takes into the future and make adjustments as necessary."
- "A good place to being the discussion of trends is demographics, because what is happening demographically today, unless altered by some catastrophe, has predictable consequences for the populations of regions and states, as well as future strategic postures and attitudes."
- "The world will add approximately 60 million people each year and reach a total of 8 billion by the 2030s. Ninety five percent of that increase will occur in developing countries....Currently, only six countries in the developing world possess populations of over 100 million people and a GDP of at least $100 billion – China, Russia, India, Indonesia, Brazil and Mexico. By the 2030s, they will be joined by Bangladesh, Nigeria, Pakistan, the Philippines, and Vietnam...The world's troubles will occur in

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developing countries where the combination of demographics and economics permits populations to grow, but makes meeting rising expectations difficult. The performance of the global economy will be key in either dampening down or inflaming ethnically or religiously based violent movements."

- "The real danger in a globalized world, where even the poorest have access to pictures and media portrayals of the developed world, lies in a reversal or halt to global prosperity. Such a possibility would lead individuals and nations to scramble for a greater share of shrinking wealth and resources, as occurred in the 1930s."
- "Over the next quarter century, China's population will grow by 170 million, but it will also age significantly because of strict enforcement of the government's one child per family policy. An additional demographic factor, which may affect Chinese behavior, is the choice of many families to satisfy that limitation with a male child. How the resulting imbalance between young males and young females will play out by the 2030s in China's internal and external politics is impossible to predict, because there are few historical analogues. Nevertheless, there are some indications of an increasing predilection to violence and nationalistic feeling among Chinese youth."
- "Even as the developing world copes with its youth bulge, the developed world will confront its acute aging problem. By the 2030s, the number of elderly people in developed countries will double, [and the ratio of elderly to working population increase]...Such demographic trends will make it less likely that nations in the developed world will sacrifice their youth in military adventures unless extraordinary threats appear."
- "The current demographic trends and population shifts around the globe underline the increasing importance of cities. The urban landscape is steadily growing in complexity, while its streets and slums are filled with a youthful population that has few connections to their elders. The urban environment is subject to water scarcity, increasing pollution, soaring food and living costs, and labor markets in which workers have little leverage or bargaining power. Such a mixture suggests a sure-fire recipe for trouble."
- "In historical terms, globalization is not the norm in human affairs."

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- "By 1913, the value of international trade as a percentage of world GDP had reached a level the global economy would not replicate until the last decade of the 20th century. The economies of the United States and Germany were expanding at unheard of rates. Western merchants were queuing up to supply China's teeming masses, as that country opened its markets for the first time in centuries. The largest migration – and a peaceful one at that – in history was taking place, as 25 million Europeans left home, most immigrating to the United States...For much of humanity, this was as time of hope and optimism...Yet within a year, the First World War had broken out."
- "The results of a dramatic slowdown in China's growth are unpredictable and could easily lead to internal difficulties or aggressive behavior externally. That is precisely what happened in Japan in the early 1930s with the onset of the Great Depression...The course that China takes will determine much about the character and nature of the 21st century...The challenges that the Chinese leadership confronts at the present are enormous, and an unsuccessful China is perhaps more worrisome than a prosperous one."
- "India could more than quadruple its wealth over the course of the next two decades, but large swaths of its population will likely remain in poverty through the 2030s. Like China, this will create tensions between the rich and the poor. Such tension, added to the divides among its religions and nationalities, could continue to have implications for economic growth and national security. Nevertheless, India's military will receive substantial upgrades in the coming years. That fact, combined with its proud martial traditions and strategic location in the Indian Ocean, will make India the dominant player in South Asia and the Middle East."
- "A central component of America's global military posture is its massive economic power. This power is predicated on a financially viable, globally connected domestic economy. Should this central feature of American power be weakened, it is highly likely that military capabilities will be diminished or otherwise degraded as a result."
- "Unless there is a major change in the relative reliance on alternative energy sources, which would require vast insertions of capital, dramatic changes in

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technology, and altered political attitudes toward nuclear energy, oil and coal will continue to drive the energy train...The central problem for the coming decade will not be a lack of petroleum reserves, but rather a shortage of drilling platforms, engineers and refining capacity. Even were a concerted effort begun today to repair these shortages, it would be ten years before production could catch up with expected demand...Biofuels are unlikely to contribute more than 1% of global energy requirements by the 2030s...Wind and solar combined are unlikely to account for more than 1% of global energy needs by the 2030s, and this assumes the energy from these sources will more than triple, which alone would require major investments...Expanding nuclear plants confronts considerable opposition because of public fears, while the disposal of nuclear waste remains a political hot potato. Moreover, construction of nuclear power plants in substantial numbers would take decades...To meet climbing global requirements OPEC will have to increase its output from 30 MBD to at least 50 MBD. Significantly, no OPEC nation, except perhaps Saudi Arabia, is investing sufficient sums in new technology and recovery methods to achieve such growth....At present, Russian leaders appear to have chosen to maximize petroleum revenues without making investments in oil fields that would increase oil and gas production over the long-term...None of the above provides much reason for optimism... By 2012 surplus oil production capacity could entirely disappear, and as early as 2015, the shortfall in output could reach nearly 10 MBD...The implications for future conflicts are ominous. If the major developed and developing states do not undertake a massive expansion of production and refining capabilities, a severe energy crunch is inevitable."

- "The pace of technological change is accelerating almost exponentially. Because most individuals tend to view change in a linear fashion, they tend to overestimate what is achievable by technology in the short term, while drastically underestimating and discounting the power of scientific and technological advances in the long term. If the pace of technical advances holds true, greater technological change will occur over the next twenty years than occurred in the whole of the 20th century."

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- "On current evidence, a principal nexus of conflicts will continue to be the region from Morocco to Pakistan through to Central Asia...The problems in the Arab-Islamic world stem from the past five centuries, during which, until recently, the rise of the West and the dissemination of Western political and social values paralleled a concomitant decline in the power and appeal of their societies. Today's Islamic world confronts the choice of either adapting to or escaping from a globe of interdependence created by the West. Often led by despotic rulers, addicted to the exports of commodities which offered little incentive for more extensive industrialization or modernization, and burdened by cultural and ideological obstacles to education and therefore modernization, many Islamic states have fallen far behind the West, South Asia, and East Asia. The rage of radical Islamists feeds off the lies of their often corrupt leaders, the rhetoric of radical Imams, the falsifications of their own media, and resentments of the far more prosperous developed world. If tensions between the Islamic world's past and the present were not enough, the Middle East, the Arab heartland of Islam, remains divided by tribal, religious and political divisions, in which continued instability is inevitable...If the Middle East continues on its troubled path, it is likely that the war on terrorism will not continue on its current levels, but could actually worsen... The economic importance of the Middle East with its energy supplies hardly needs emphasis...They are too important for the U.S., China and other energy importers to allow radical groups to gain dominance or control over any significant portion of the region."
- "There is one dynamic in the literature of weak and failing states that has received relatively little attention, namely the phenomenon of rapid collapse...In terms of worst case scenarios for the Joint Force, and indeed the world, two large and important states bear consideration for a rapid and sudden collapse: Pakistan and Mexico."

The second document is "Global Trends 2025", which was published by the National Intelligence Council of the U.S. Government. The objective of this study is described as follows: "By examining a small number of variables that we judge probably will have

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a disproportionate influence on future events and possibilities, this study seeks to help readers to recognize signposts indicating where events are headed and to identify opportunities for policy intervention to change or lock in the trajectories of specific developments." Key highlights of this report include the following:

- "In the 20th century, experts forecasting the next 20 years – roughly the time frame of this study – often missed major geopolitical events, basing their predictions largely on linear projections without exploring possibilities that could cause discontinuities...Lessons from the last century appear to suggest that (1) leaders and their ideas matter; (2) economic volatility introduces a major risk factor – there is a strong correlation between rapid economic change, both positive and negative, and political instability; and (3) geopolitical rivalries trigger discontinuities more than does technological change."
- "The international system – as constructed following the Second World War – will be almost unrecognizable by 2025 owing to the rise of emerging powers, a globalizing economy, an historic transfer of wealth and economic power from West to East, and the growing influence of non-state actors. By 2025, the international system will be a global, multipolar one."
- "Historically, emerging multipolar systems have been more unstable than bipolar or unipolar ones. Despite the recent financial volatility – which could end up accelerating many ongoing trends – we do not believe that we are headed toward a complete breakdown of the international system as occurred in 1914- 1918 when an earlier phase of globalization came to a halt. However, the next twenty years of transition to a new system are fraught with risks. Strategic rivalries are most likely to revolve around trade, investments, and technological innovation and acquisition, but we cannot rule out a 19th century-like scenario of arms races, territorial expansion and military rivalries...Although the United States is likely to remain the single most powerful actor, the United States' relative strength – even in the military realm – will decline and U.S. leverage will become constrained."

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- "China is poised to have more impact on the world over the next 20 years than any other country. If current trends persist, by 2025 China will have the world's second largest economy and will be a leading military power. It could also be the largest importer of natural resources and the biggest polluter."
- "Over the next several decades, the number of people considered to be in the global middle class is projected to swell from 440 million to 1.2 billion, or from 7.6 percent of the world's population to 16.1 percent. Most of the new entrants will come from China and India."
- "India probably will continue to enjoy relatively rapid economic growth. Although India faces lingering deficiencies in its domestic infrastructure, skilled labor, and energy production, we expect the nation's rapidly expanding middle class, youthful population, reduced reliance on agriculture, and high domestic savings and investment rates to propel continued economic growth...Indian policymakers are convinced that US capital, technology and goodwill are essential to India's continued rise as a global power...The Indian diaspora – composed largely of highly skilled professionals – will remain a key element in deepening US-Indian ties."
- "Asia's economic powerhouses – China and India – are restoring positions they held two centuries ago, when China produced approximately 30 percent and India 15 percent of the world's wealth."
- "Historically, people who become accustomed to rising living standards react angrily when their expectations are no longer met. Few people have had grounds for such high expectations as do the Chinese...A protracted economic slump could pose a serious political threat to the Chinese government, which would be tempted to deflect public criticism by blaming China's woes on foreign interference, stoking the more virulent and xenophobic forms of Chinese nationalism."
- "The range of possible futures for Russia remains wide because of starkly divergent forces – liberal economic trends and illiberal political trends. The tension between the two trends, together with Russia's sensitivity to potential discontinuities sparked by political instability, a major foreign policy crisis, or other wild cards, makes it impossible to exclude alternative futures such as a nationalistic, authoritarian petro-

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state or even a full dictatorship, which is an unlikely but nevertheless plausible future. Less likely, Russia could become a significantly more open and progressive country by 2025."

- "Europe and Japan will continue to far outdistance the emerging powers of China and India in per capita wealth, but they will struggle to maintain robust growth rates because the size of their working-age populations will decrease...The drop off in working age populations will prove a severe test for Europe's social welfare model, a foundation stone of Western Europe's political cohesion since World War II...The annual level of net immigration would have to double or triple to keep working-age populations from shrinking in Western Europe. By 2025, non-European minority populations could reach significant proportions – 15 percent or more – in nearly all Western European countries and will have a substantially younger age structure than the native population. Given growing discontent with current levels of immigrants among native Europeans, such steep increases are likely to heighten tensions...Slow overall growth rates, highly regulated labor markets, and workplace policies, if maintained, will make it difficult to increase job opportunities in Europe, despite the region's need to stem the decline of its working age population. When coupled with job discrimination and educational disadvantages, these factors are likely to confine many Muslims to low-status, low-wage jobs, deepening ethnic cleavages...By 2025, Muslim-related issues will be a growing focus and shaper of the European political scene."
- In Japan, "the shrinking workforce, large numbers of unemployed and untrained citizens in their teens and early 20s, and Japan's cultural aversion to substantial immigrant labor will put a major strain on Japan's social services and tax revenues."
- Over the next twenty years, "resource issues will gain prominence on the international agenda. Unprecedented global economic growth – positive in so many other regards – will continue to put pressure on a number of highly strategic resources, including energy, food and water, and demand is projected to outstrip easily available supplies over the next decade or so....Non-OPEC liquid hydrocarbon production – crude oils, natural gas liquids, and unconventionals such as tar sands – will not grow

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commensurate with demand...Countries capable of significantly expanding production will dwindle; oil and gas production will be concentrated in unstable areas."

- "All current technologies are inadequate for replacing the traditional energy architecture on the scale needed, and new energy technologies will probably not be commercially viable and widespread by 2025...Even with a favorable policy and funding environment for biofuels, clean coal or hydrogen, the transition to new fuels will be slow. Major technologies have historically had an "adoption lag." In the energy sector, a recent study found that it takes an average of 25 years for a new production technology to become widely adopted."
- "Despite what seem long odds now, we cannot rule out the possibility of an energy transition by 2025 that would avoid the costs of an energy infrastructure overhaul. The greatest possibility for a relatively quick and inexpensive transition during the period comes from better renewable generation resources (photovoltaic and wind) and improvements in battery technology."
- "Demand for food will rise by 50 percent by 2030 as a result of growing world population, rising affluence, and the shift to Western dietary preferences by a larger middle class...Climate change is expected to exacerbate resource scarcities."
- "It is not clear that the type of stable deterrent relationship that existed between the great powers for most of the Cold War would emerge naturally in the Middle East with a nuclear weapons capable Iran."
- "The force of ideology is likely to be strongest in the Muslim world – particularly the Arab core. In those countries that are likely to struggle with youth bulges and weak economic underpinnings – such as Pakistan, Afghanistan, Nigeria and Yemen – the radical Salafi trend of Islam is likely to gain traction."
- "Types of conflict we have not seen for awhile – such as over resources – could reemerge. Perceptions of energy scarcity will drive countries to take actions to assure their future access to energy supplies. In the worst case, this could result in interstate conflicts if government leaders deem assured access to energy resources to be essential for maintaining domestic stability and the survival of their regimes."

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- "Greater Asian regionalism – possible by 2025 – would have global implications, sparking or reinforcing a trend toward three trade and financial clusters that could become quasi-blocs: North America, Europe and East Asia...On the other hand, an absence of regional cooperation in Asia could help spur competition among China, India and Japan over resources such as energy."
- "By 2025, the United States will find itself as one of a number of important actors on the world stage, albeit still the most powerful one. Even in the military realm, where the US will continue to possess considerable advantages in 2025, advances by others in science and technology, expanded adoption of irregular warfare tactics by both state and non-state actors, proliferation of long-range precision weapons, and growing use of cyber warfare attacks increasingly will constrict US freedom of action."
- "The above trends suggest major discontinuities, shocks and surprises...In some cases, the surprise element is only a matter of timing: an energy transition, for example, is inevitable; the only questions are when and how abruptly or smoothly such a transition occurs. An energy transition from one type of fuel to another is an event that historically has only happened once in a century at most with momentous consequences. Other discontinuities are less predictable. They are likely to result form an interaction of several trends and depend on the quality of leadership. We put uncertainties such as whether China or Russian becomes a democracy in this category. Also uncertain are the outcomes of demographic challenges facing Europe, Japan and Russia...Technology, the role of immigration, public health improvements, and laws encouraging greater female participation in the economy are some of the measures that could change the trajectory of current trends pointing toward less economic growth, increased social tensions, and possible decline."
- "In Iran – a state rich in natural gas and other resources and high in human capital – political and economic reform in addition to a stable investment climate could fundamentally redraw both the way the world perceives the country and also the way in which Iranians view themselves. Under these circumstances, economic resurgence could take place quickly, and embolden a latent cosmopolitan, educated and at times secular Iranian middle class. If empowered, this portion of the population could

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broaden the country's horizons, particularly eastward and away from decades of being mired in the Arab conflicts of the Middle East."

The third document is a rather long article in *The New Republic* by the historian Walter Russell Mead (author of the book God and Gold: Britain, America and the Making of the Modern World). He has a different take on the current crisis that provides stimulating food for thought. Mead begins by noting that "capitalism has seen a steady procession of economic crises and panics...but as yet they have not disrupted the rise of a global capitalist system, centered first on the power of the United Kingdom [and before that, the Netherlands] and then, since World War II, on the power of the United States. After more than 300 years, it seems reasonable to conclude that financial and economic crises do not, by themselves, threaten either the international capitalist system or the special role within it of leading capitalist powers like the United Kingdom and the United States. If anything, the opposite seems true – that financial crises in some way sustain Anlgophone power and capitalist development."

Mead observes that countries like Russia, Venezuela and Iran, which hoped to use oil revenues to mount a serious political challenge to American power and the existing world order now face serious new constraints." He also writes that "the damage to China's position has been more subtle. The crisis has not – yet – led to the nightmare scenario that China watchers fear: a recession or slowdown producing the kind of social unrest that could challenge the government...But even if the worst case is avoided, the financial crisis has nevertheless had significant effects. For one thing, it has reminded China that its growth remains dependent on the health of the U.S. economy. For another, it has shown that China's modernization is likely to be long, dangerous, and complex rather than fast and sweet, as some had assumed." In the future, "Beijing will have to devote more resources and more attention to stabilizing Chinese society, building a national health care system, providing a social security net, and caring for an ageing population, which, thanks to the one-child policy, will need massive help from the government to support itself in old age. Doing so will leave China with fewer resources for military build-ups and foreign adventures...In addition,

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every other country in the world has experienced significant crises while building a functional and flexible financial system, and China is unlikely to be an exception. All this means that China's rise looks increasingly like a more gradual process."

Mead concludes that "every crisis is different, but there seem to be reasons why, over time, financial crises on balance reinforce rather than undermine the world position of the leading capitalist countries...Countries that can encourage – or at least allow and sustain – the change, dislocation, upheaval, and pain that capitalism often involves, while providing their tumultuous market societies with appropriate regulatory and legal frameworks, grow swiftly, and produce cutting edge technologies that translate into military and economic power." In contrast, "many other countries are only half-heartedly capitalist. When crisis strikes, they are quick to decide that capitalism is a failure and look for alternatives. So far, such half-hearted experiments not only have failed to work, they have left the societies that have tried them (such as Argentina) in a progressively worse position as time goes by...Consequently, financial crises often reinforce rather than challenge the global distribution of power and wealth. That may be happening yet again." However, Mead ends on a sober note, observing that bad economic times have also bred wars.

Taken together, these three documents paint a sobering picture of the world investors are likely to confront over the next twenty years. From an asset allocation perspective, a number of tentative conclusions seem to emerge from them. First, returns on oil and gas commodities and/or alternative energy companies are likely to be high in the years ahead. We look forward to someone launching an investable market neutral fund that is long a broad cleantech index and short the overall equity market. Second, higher levels of uncertainty over the next twenty years should lead to higher than historical returns on asset classes that perform well under such conditions, including short term government bonds, timber, gold, and equity volatility. Third, due to demographic trends whose consequences seem politically hard to avoid, returns to labor are likely to rise, and returns to capital are likely to decline in Europe and Japan. This implies lower returns on equity in these regions in the future. In turn, this could increase the relative attractiveness of U.S., and potentially Canadian and Australian

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equities. Fourth, rising unrest and conflict seems likely to disrupt many corporate supply chains which were extended around the world over the last ten years in a quest for greater efficiency (that now appears to have been bought at the price of greater fragility). Along with future energy price shocks, this could have a significant negative impact on global corporations' earnings, while also stimulating renewed investment in developing countries to rebuild local supply networks. Fifth, rising levels of conflict also seem likely to make emerging market investments a riskier proposition than they have been in the recent past; increased selectivity will be important to generating attractive returns. In this regard, India looks to be a less risky bet than China at this point. Finally, as we have written so many times before, many investors have probably yet to fully appreciate the extent to which events in China will have a long-term impact on global risk premiums, growth rates, and patterns of trade and investment.

Economic Situation Update

As noted in our January 2009 issue, for the duration of the current crisis we will be updating our economic and asset allocation outlook each month using an explicit Bayesian methodology. Our approach is based on a combination of quantitative and qualitative methods. With respect to the first approach, our quantitative assessment of current asset class valuations is found in our Asset Class Valuation Update. We also believe that quantitative indicators also can help us – albeit imperfectly – develop a better understanding of which of three macroeconomic/market regimes we are in, and which may be the next one to develop. We characterize these regimes as "high uncertainty", "high inflation" and normal times. The following table contains the quantitative indicators we use, including key spreads in the fixed income market and rolling three month returns on a variety of investments. We use the highest of these as an indication of the market's "conventional wisdom" about the regime we are in today. As we note in our Asset Class Valuation Update, with respect to sector rotation cycles across a business cycle, the highest returns are earned by those investors who act ahead of the conventional wisdom, while the lowest are earned by those who lag behind it.

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Regime Indicators		30Jan09
High Uncertainty	**High Inflation**	**Normal**
Current 10 Year Treasury less AAA Yield (1 month change)* **2.48% (+.09%)**	Current 10 Year nominal Treasury less 10 year TIP Yield (1 month change) **1.14% (+1.03%)**	Current AAA-BAA Yield (1 month change)* **2.93% (-.40%)**
Short Maturity US Govt Bonds (SHY) **1.62%**	US Real Return Bonds (TIP) **7.39%**	US Equity (VTI) **-13.88%**
1 - 3 Year International Treasury Bonds (ISHG) **3.20%**	Long Commodities (DJP) **-17.45%**	EAFE Equity (EFA) **-11.96%**
Swiss Francs (FXF) **0.33%**	Global Commercial Property (RWO) **-25.91%**	Emerging Equity (EEM) **-9.59%**
Gold (GLD) **27.99%**	Long Maturity Nominal Treasury Bonds (TLT)** **13.42%**	High Yield Bonds (HYG) **7.88%**

* 1986-2008 average AAA spread is 1.20%; average BBB spread is .94%
** falling returns on TLT indicate rising inflation expectations

Our qualitative methodology begins with our prior view -- the two alternative scenarios we described last month. They are based on "basins of attraction" which characterize the behavior of a complex adaptive system that has crossed into the chaotic region of activity. One of these scenarios is based on the emergence of cooperative structures and solutions to the current crisis, which would reduce its length and severity. Broadly speaking, these solutions would encompass the three main aspects of the current crisis: Heightened uncertainty and plummeting private sector spending; reduction in the real value of record breaking levels of indebtedness; and structural imbalances in

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the world economy, especially the high level of savings (and resulting current account surplus) in China (and to a lesser extent Germany, Japan and the oil exporting nations of the Middle East) and the low level of saving (and resulting current account deficits) in the United States and, to a lesser extent, other Anglosphere nations.

In the second scenario, cooperative solutions fail to emerge, leading to heightened conflict and a longer and more damaging crisis. We further believe that the scenario that eventually develops will significantly depend on the actions of three disparate groups: middle class Americans, Chinese peasants, and Iranian youth (we note that the Wall Street Journal recently published an article that reached the same conclusion about the importance of the latter group).

Our approach to determining which scenario is developing is to search for new evidence that is much more likely to be found in one scenario than in the other (i.e., evidence with both high diagnostic value and high reliability). We also look for anomalous evidence that seems inconsistent with both scenarios; we hope that by tracking anomalies over time we will be able to minimize our susceptibility to the confirmation bias, and recognize when an unanticipated scenario is beginning to develop. The risk, of course, is that because the allocation of our attention is conditioned by our mental models, we may miss important anomalies. In this context, we believe the following developments are significant indicators:

- In the United States, (and indeed around the world) there was considerable disappointment and frustration with both the contents and politics of the stimulus bill and Treasury Secretary Geithner's plan to arrest the growing debt implosion that is causing demand to contract in a self-reinforcing downward spiral. These developments do not bode well for the cooperative scenario. To be sure, the stimulus bill contains some attractive elements, including $19 billion for healthcare information technology, $6 billion for higher spending on science and engineering research, $10 billion for higher health research, $70 billion in spending and tax credits for renewable energy and energy efficiency improvement (including $11 billion for electricity transmission and distribution

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system improvements), and $46 billion for better transportation infrastructure. If history is a valid guide, these commitments should generate substantial productivity improvements and higher economic growth in the future. To put this in perspective, the aggregate spending in these areas -- $151 billion dollars – is about equal to the value (in 2007 dollars) of NASA's spending on manned spaceflight programs between 1959 and 1973 -- $145 billion. For better or worse, however, the stimulus program also includes an additional $638 billion in tax breaks and transfer payments. Given recent evidence of falls in both consumer spending and debt outstanding, the multiplier impact this will produce on aggregate demand is likely to disappoint. In no small measure, this is due to the continuing failure to address the fundamental need for debt reduction, not just in the case of insolvent banks, but also in the household sector (where growing job losses will only cause higher losses on credit card debt and mortgages – even before upcoming resets on adjustable rate mortgages). Liquidating excess debt can be accomplished in a number of ways, including increasing inflation, converting it to equity, extinguishing it in bankruptcy, or having it absorbed by the government. Of these, the inflation route is likely to be strongly resisted by the United States' external creditors, as China has already begun to make clear. Yet until this reduction happens, uncertainty will remain high, spending will remain depressed, and government spending will at best only stabilize, but not improve the situation.

- On top of rising job losses, bankruptcies, foreclosures, uncertainty and fear (which have been heightened, no doubt, by the rapid transfer of vivid stories and images over the internet), middle class Americans have also been treated to the twin spectacles of bankers receiving large bonuses paid for with taxpayer funds (CEOs' claims to the contrary notwithstanding, as most people realize that money is fungible) and public sector unions continuing to press for rising pay and benefits, even if this requires painful cutbacks in other areas. The cumulative impact of all these developments appears to be a rising tide of

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populist anger that has yet to find a suitable outlet – though calls for higher protectionism and/or inflation seem a likely candidate at some point. Again, this does not bode well for the cooperative scenario.

- In written testimony presented during his confirmation hearings, Secretary Geithner claimed that China had been manipulating its currency. Premier Wen Jiabao responded at the World Economic Forum in Davos, blaming the global economic crisis on "an unsustainable model of development, characterized by prolonged low savings and high consumption." In a subsequent interview with the *Financial Times*, Premier Wen asserted that "to allege China is manipulating its currency exchange rate is completely unfounded." In response to a question as to whether China bore any responsibility for the current crisis, Premier Wen replied, "I think such a view is ridiculous. I think the reason for this financial crisis is the imbalance of some economies themselves. They have for a long time had double deficits and they keep up a high level of consumption on the basis of mass borrowing. In those economies, the financial institutions have not been put under effective regulation and the financial institutions have reaped massive profits with a very high leverage ratio. Once such a bubble bursts, the whole world has been exposed to a big disaster...I think that it is confusing right and wrong when people who have been overspending blame those who lent them the money. In China there is actually a proverb expressing this kind of situation...to blame those who have actually done you a favor for your own wrongdoing." Clearly, this evidence of rising tension in the critical China/U.S. relationship suggests a rising probability that the conflict scenario is developing. However, Wen also expressed an apparent interest in continuing to search for cooperative solutions: "I hope the FT can convey a message from me to the U.S. side. We want to enhance cooperation with the United States to meet the financial crisis together as that represents the larger interest, and it serves the fundamental interests of both countries."

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- Clearly, the Chinese leadership seems to have a strong incentive to pursue a cooperative path. Recently released fourth quarter economic data showed a rapidly worsening economic situation in China, including rising unemployment and accelerating falls in property prices. In response to these developments, the Chinese government announced a new $124 billion plan to make substantial improvements in the nation's healthcare system, in the hopes, we suspect, of convincing Chinese citizens to boost consumption spending by reducing precautionary savings for this purpose. It also instituted new regulations that make it more difficult for companies to layoff workers, and directed a substantial increase in lending by state-owned banks. In our view, however, the most telling piece of data was a New York Times report that capital outflows from China were increasing, marking the reversal of a ten year trend. Anyone who has lived in Latin America can tell you that this is usually a leading indicator of where the domestic economy is headed – and in this case, if it continues, it would seem to indicate a rising probability of domestic unrest and the development of the conflict scenario.

- In Iran, there were continuing indications of backchannel attempts by the Ahamdinejad regime to reduce the level of tension with the United States. Undoubtedly, this comes in response to worsening economic conditions caused by falling oil prices and continued trade sanctions, as well as the entry into the presidential race of former president Mohammad Khatami, a moderate cleric (by Iranian standards) who had been encouraged to run by various student groups. He was recently quoted as saying, "as saying the "current situation is not desirable" and that if it continued, Iran's "social capital and international reputation will be damaged even more." These developments indicate a rising probability of the cooperative scenario developing.

Taken together, the most recent indicators suggest a rising probability of the conflict scenario developing. From an asset allocation perspective, that suggests possible

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further price rises in asset classes that hedge against uncertainty and deflation, including short term government bonds, volatility, gold, and timber. While some argue that corporate bonds also belong in this category, especially given the way prices have been battered by the credit crisis, we remain unconvinced. While credit risk premiums for AAA rated bonds are close to all-time highs, we are dealing with an extraordinary set of economic circumstances. At best, bargains in this area are likely to be found via good old fashioned in-depth credit analysis, and not by investing in an index product that tracks this sector of the fixed income market.

Looking a bit further out, it seems probable that the massive growth in the money supply now underway (which will only accelerate when the U.S. Federal Reserve is forced to help finance the massive increases in the U.S. federal deficit) can only lead to much higher inflation. As we have noted in the past, higher inflation would also be a politically popular means of reducing the current debt burden (at least with those members of the middle class who own homes financed with fixed rate mortgages). With ten year U.S. Treasury Bonds still yielding less than three percent, it is clear that higher inflation has not yet been priced into many asset classes. Hence, there is a good argument to be made that inflation hedges like real return bonds, property, commodities, timber and, to a lesser extent, gold will at some point experience significant price increases. If inflation in the U.S. is higher than in other countries, we should also expect to see higher U.S. dollar returns on foreign currency bonds (and lower returns on U.S. assets for investors whose functional currencies are appreciating). The Eurozone, India, Japan and Switzerland seem good candidates for this type of development, while we are less certain about whether Australia, Canada, and the U.K. will also experience lower inflation than the United States. Finally, while we very strongly believe that we will eventually see “once in a lifetime” opportunities in equity markets (when dividend yields peak), in light of current conditions, we do not believe we have reached this point yet.

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Product and Strategy Notes

Carbon Update

In the past, we have noted both the possibility of investing in carbon emission credits (via the GRN exchange traded note), as well as our initial skepticism about whether doing so would provide much in the way of portfolio diversification benefits (e.g., in the last quarter of 2008, their value fell in line with the FTSE All Country World equity index). The correlation between the two will only fall if the emissions trading system is widely adopted as a means of limiting CO2 emissions, and if supply of emissions certificates is severely curtailed – that is, if the effective price of CO2 emissions is driven very high. In the short term, that would drive down economic growth and equity values, as well as the correlation. Of course, given the current condition of the world economy, it might also trigger widespread political unrest, as has already been the case with Australia's announced but not yet implemented cap-and-trade system. In the near term, the imposition of tighter carbon emissions limits seem likely to be delayed.

However, this is not to say that there has not been interesting news on the carbon front – on the contrary, we've seen a number of very interesting developments. To begin with, the conventional wisdom that cap-and-trade systems are preferable to straightforward carbon taxes may have been fatally undermined by the financial crisis and spike in populist anger at Wall Street. As John Dizard cynically noted in a recent *Financial Times* column, "Wall Street and Chicago always like the creation of trading markets for new assets, especially if they can be inefficiently priced by the professionals." Canada has already seen an attempt to launch such a tax – the Liberal Party's "green shift" proposal in the last election would have instituted a revenue neutral carbon tax, whose revenues would have been offset by income tax reductions. However, it went down with the Liberals' overall electoral performance.

New research from the McKinsey Global Institute ("The Carbon Productivity Challenge") suggests that we may have not yet heard the end of carbon tax proposals. McKinsey notes that achieving a 10x increase in GDP/metric ton of carbon emissions

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would require investment of only $570 billion per year between 2010 and 2030 – just 2 to 4 percent of the total capital expenditures that McKinsey forecasts will be made over this twenty year period. The report further concludes that 70 percent of the technologies required are either available now or on the horizon (including, we note, recognizing the full environmental value of forests). The remaining 30 percent of technological progress can only be achieved if "we put a clear price on carbon." From a corporate investment point of view, this makes sense, as anyone who has presented a discounted cash flow analysis to a board well knows. It is hard to see how the level of certainty required to support higher investments in carbon productivity can be achieved with a cap and trade system – a carbon tax seems a much more efficient approach. We have no doubt that this is why Rex Tillerson, CEO of ExxonMobil, said in January that he favored this approach over a cap and trade system. Yet the proper level at which such a tax should be set remains subject to great uncertainty, as evidenced by another recent report, this one from the The MIT Joint Program on the Science and Policy of Global Change. In "Uncertainty in Greenhouse Gas Emissions and Cost of Atmospheric Stabilization," Webter, Palsev, Parsons, Reilly and Jacoby use Monte Carlo simulation to explore the impact of uncertainty on one hundred parameters in the MIT Emissions Prediction and Policy Analysis model. They "find considerable uncertainty in emissions prices" under various stabilization targets for aggregate CO2 levels in the atmosphere. "For example, the CO2 price in 2060 under an emissions constraint targeted to achieve stabilization at 650 parts per million [of CO2 in the atmosphere, versus about 385 today] has a 90% confidence range of US$14/ton to $88/ton. A 450ppm target in 2060 has a range of $241/ton to $758/ton." As to what is driving these wide ranges of outcomes, the authors conclude that "despite significant uncertainty in future energy supply technologies, the largest drivers of uncertainty in costs of atmospheric stabilization are energy demand parameters, including elasticities of substitution [between the energy, capital and labor needed for a given level of output, and between different sources of energy] and energy efficiency trends." A final uncertainty, much noted by others, is the extent to which developing countries, particularly China, will agree to any type of emissions pricing. In so far as

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such pricing could restrain economic growth, and thereby threaten political stability, the answer thus far has been "no." Indeed, one suspects that the environmental consequences of higher CO2 levels, and their social impact, would have to become significantly more severe before developing country governments are willing to change this position.

Beyond these political obstacles to successful emissions reductions, another report, just published in the Proceedings of the National Academy of Science, suggests that we may soon see a fundamental rethinking of the division of resources between efforts to stabilize emissions levels and efforts to either mitigate or reverse their climate impact. In "Irreversible Climate Change Due to Carbon Dioxide Emissions", Solomon, Plattner, Knutti and Friedlingstein show "that the climate change that takes place due to increases in carbon dioxide concentration is largely irreversible for 1,000 years after emissions stop...Among irreversible impacts that should be expected if atmospheric carbon dioxide concentrations increase from current levels near 385 ppm to a peak of 450 – 600 ppm over the coming century are irreversible dry-season rainfall reductions in several regions [e.g., around the Mediterranean, the U.S. Southwest and Mexico] comparable to those of the 'dust bowl' era, and inexorable sea level rise."

At the current rate of increase of 2.5 ppm/year, we will reach 450 ppm in just 26 years, and that assumes the rate of increase does not become higher due to non-linear feedback effects. That is an extremely short time window for emissions reductions to have an impact, particularly given political opposition to carbon pricing in most developing countries. Hence, we are beginning to see more discussion not only of increased spending on preparation for a significantly different climate, but also of so-called "geoengineering" to offset the impact of higher CO2 levels on planetary temperature. These fall into two broad categories – "albedo management" which increases the amount of sunlight reflected back from the earth, and "carbon management", which uses largescale techniques to sequester larger amounts of CO2, including aggressive forestation and "bio-char burial" (using more efficient production of charcoal to sequester carbon and simultaneously enrich soils). In a recent report on

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geoengineering ("The Radiative Forcing Potential of Different Climate Geoengineering Options" by Lenton and Vaughan), the authors conclude that albedo management has the most short term potential. These techniques are basically aimed at increasing the brightness and reflectivity of clouds, either by seeding them with chemicals or by pumping seawater into the air over the oceans to increase the rate of cloud formation. Of course, geoengineering also raises issues, including unforeseen consequences and the political issue of who pays for the negative impacts of the resulting changes in global weather patterns.

In sum, a number of emerging trends in the climate debate have yet to receive significant coverage in the mainstream media. In our view, these trends suggest that emissions credits are unlikely to become a new asset class that can provide investors with a significant new source of returns that have a low correlation with those on existing asset classes. On the other hand, these trends also seem likely to give rise to a much larger set of investment opportunities that could allow skilled managers who take a structured approach (e.g., going long specific stocks and short the overall equity market) to generate the uncorrelated returns that are so valued by wise investors. While we are not there quite yet, this is clearly an area to watch.

Will This Crisis Finally Change Investor Behavior?

A lot has happened since we started *The Index Investor* in 1997. Through it all, we have held fast to a core set of beliefs: (1) that investors should primarily focus on the returns needed to fund their liabilities, and not external benchmarks; (2) that consistently successful active management (or picking active manages who will succeed in the future) is beyond the skills of most investors; (3) that as a result, only a small portion of a portfolio should be allocated to active management, and that focused on uncorrelated alpha strategies; and (4) that the bulk of investor's efforts should be focused on allocating wisely between different broad asset classes, rebalancing systematically, minimizing expenses and taxes, and maintaining a constant watch for the substantial overvaluations whose subsequent crash can

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severely affect the chances of achieving one's long-term goals. To be sure, there have been others who have conveyed the same or similar message – for example, see Mark Kritzman's excellent recent article "Rules of Prudence for Individual Investors." Unfortunately, in aggregate, our collective voice has been overwhelmed by the money spent by the active management community to communicate a different message. As Bob Shiller pointed out in a recent New York Times column ("How About a Stimulus for Financial Advice?"), "most people get financial advice only from sales representatives of one sort or another" who "face competitive pressures to promote products that exploit to the hilt [people's tendency to behave irrationally and make judgment errors]". Advice from people with a fiduciary obligation to protect their clients' best interest still remains a luxury to which too few people have access.

In 2001, we wondered how much the bursting of the technology bubble would change this. The subsequent seven years provided an answer that was, at best, only mildly encouraging for people who share our views. So it is only logical to ask whether the aftermath of the current crisis will be any different.

Some of the available evidence is encouraging. The past few months have seen big outflows out of actively managed funds and into index mutual and exchange traded funds. The extent to which this reflects greater awareness – either explicit or instinctive – of recent research on broker sold funds remains unknown. For example, in "Assessing the Costs and Benefits of Brokers in the Mutual Fund Industry", Bergstresser, Chalmers and Tufano found that, "relative to direct-sold funds, broker-sold funds deliver lower risk-adjusted returns, even before subtracting distribution costs." They conclude that their results "are consistent with either substantial non-tangible benefits delivered by the broker-distributed sector [e.g., planning and tax services, education and counseling, etc.] or with conflicts of interest between brokers and their clients." Regarding the latter, another paper ("The Use and Abuse of Mutual Fund Expenses" by Houge and Wellman) concludes that "as the mutual fund industry becomes more adept at segmenting customers by level of investment sophistication...load mutual fund companies take advantage of this ability and charge higher expenses to their target customer: the less-knowledgeable investor. No-load

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companies, which tend to attract the more sophisticated investor, offer lower expenses."

Elsewhere, *Pensions Age* reported that ninety six percent of pensions surveyed reported that they get good value for their money from passive investments, while sixty percent thought Funds of Hedge Funds (with their fees on top of fees structure) were a poor value. Yale's David Swensen was even harsher on fund-of-funds in a recent interview with the Wall Street Journal: "[they] are a cancer on the institutional investor world. They facilitate the flow of ignorant capital. If an investor can't make an intelligent decision about picking [hedge] fund managers, how can he make an intelligent decision about picking a fund-of-funds manager who will be selecting hedge funds? There are also more fees on top of fees. And the best managers don't want fund-of-funds money because it is unreliable. You need to be in the top 10% of hedge funds to succeed. In a fund-of-funds, you will likely be excluded from the best managers."

Following another recent survey, Spectrem Group reported that nearly two thirds of U.S. millionaires said their investment advisers had failed them, after watching their portfolios decline by an average of thirty percent last year (17 percent lost 40 percent or more). To put that in perspective, the following table shows the Economist Intelligence Unit's estimate of the number of households that had net wealth of US $1 million or more in 2007:

Country	**Households (in millions)**
United States	16.6
United Kingdom	4.1
Japan	3.6
France	3.0
Italy	2.8
Germany	2.4
Canada	1.1
Spain	1.0
Australia	0.9
Switzerland	0.7

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Not surprisingly, another recent survey, this one by Oppenheimer Funds, found that 66% of U.S. financial advisers planned to spend the most time in 2009 addressing wealth preservation and asset allocation with their clients. And a recent survey by Met Life and Greenwich Associates found that asset allocation was ranked as the most important "risk factor affecting your pension plan" by 54%, almost the same as the 47% who ranked underfunding liabilities as most important – and only 44% of respondents rated themselves as being "very successful" in managing their top-ranked risk factor.

Clearly, there are some reasons to hope that, to use a phrase that is sadly familiar to anyone with a sense of history, "this time it will be different." Above all, the flow of funds data – with the relatively large inflows into indexed ETFs – suggests that a fundamental change may be underway. This is consistent with a body of research that finds personal experience – which generates both cognitive and emotional responses – is a more powerful motivator of behavioral change than information received about the experience of others, which generally lacks the same emotional impact (see, for example, "The Tree of Experience in the Forest of Information" by Simonsohn, Karlsson, Loewenstein and Ariely).

On the other hand, some deeply ingrained aspects of human nature seem to work in favor of actively managed products. For example, studies have repeatedly found that when they have lost money relative to a reference point, human beings tend to become less loss averse and more willing to take risks. In the United States, rising levels of both consumer borrowing and gambling industry revenues in the face of a growing retirement income security seem to provide strong evidence of this phenomenon. This undoubtedly accounts for "performance chasing", and the overall susceptibility to active funds' promise of high returns that will almost magically fix a scary financial situation without the pain of reduced consumption. Repeated surveys have also found that human beings tend to be overoptimistic about their future portfolio returns and overconfident about their relative skills as investors (though we noted this is much more true of men than women). Hence the perennial appeal of the active

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management community's question to investors who buy index products: "Who wants to earn only average returns?"

When only 18% of the U.S. adult population (about 43 million people) is willing to join a health club (at an average membership cost of between $360 and $400 per year), we are skeptical that a greater percentage would be willing to pay similarly explicit (and possibly greater) average annual fees to a fiduciary adviser who could help ensure their financial well-being. In this regard, both Citibank's "myfi.com" initiative (which involves Jonathan Clements, who wrote so many great columns for the Wall Street Journal) and Financial Engines continue to be experiments well worth watching. On balance, rather than a widespread change in a willingness to pay for unbiased financial advice from a true fiduciary, we suspect that the most recent blow to families' finances will instead result in much greater political pressure to expand public pension systems. At best, this might include a more widespread move towards Australian style mandatory individual pension contributions, with a choice of index fund investment options, and the requirement that a substantial portion of the plan balance be annuitized at retirement. At worst, it will result in demands for higher benefit payments from already strapped "pay-as-you-go" social security systems.

That said, there are also some encouraging early indicators that a significant shift is underway among affluent investors, and among institutional pension plans whose trustees have a fiduciary obligation to invest prudently. Only time will tell whether this trend will sustained, and, if it is, whether it will have a significant impact further down the wealth distribution.

Private Equity Update

A number of new reports were recently issued on various issues related to private equity. The British Private Equity and Venture Capital Association published a report on the sources of returns realized on fourteen of the biggest private equity deal exits that occurred between 2005 and 2007. In aggregate, these deals realized a return 330% higher than a matched sample of publicly listed companies. Of this amount,

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100% was due to rising stock market multiples, 167% came from the use of leverage, and 62% (i.e., 19% of the total incremental return) came from strategic and operational improvements. While the sample size was criticized as too small, the finding that only about 20% of the total investment return was due to operating improvements is in line with previous studies. This is significant for investors in private equity funds, since, in the foreseeable future market multiples and the availability of debt financing are both likely to contract – perhaps severely.

No doubt with this in mind, the Boston Consulting Group has published a study titled, "Get Ready for the Private Equity Shakeout." Their conclusion is stark: "Private equity firms have enjoyed extraordinary growth and returns over the past five years, but the collapse of the world's debt markets and the deepening economic crisis have brought this boom to an abrupt end, with potentially severe consequences for private-equity firms, the companies they own, and the real economy." They assert that "private equity is in the middle of the perfect storm", since, "the debt bubble has burst, company earnings have dropped, multiples have collapsed, institutional investors are reducing their private equity asset allocation, and most private equity portfolio companies are expected to default." BCG wonders whether portfolio company debt constitutes "a hidden time bomb", since it is not clear who, after repeated securitizations (via Collateralized Debt Obligations) holds the ultimate risk, and how much capital supports it. In the end, BCG believes that "the biggest impact of the perfect storm will be on the private equity firms themselves – around 20 to 40 percent will disappear, at least 30 percent will survive, and the fate of the rest hangs in the balance." When the smoke clears, BCG expects that "pure debt and multiple players will disappear", leaving those firms with the strongest "operational value creation" capabilities. In a previous report ("The Advantage of Persistence"), BCG concluded that two factors lay at the heart of these capabilities: (1) superior industry expertise, which benefited both access to deals and the ability to generate value creating strategic insights, and (2) "the ability to come in and turn around the operations of a portfolio company."

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As someone who spent a significant part of his career advising and later leading corporate turnarounds, this second capability is a subject near and dear to my heart. Over the years, I realized that there were two aspects to it. The first I called "stop losing", or getting the basics right to increase current cash flow. It required a fairly directive approach, and could usually be counted on to move an organization from the left tail into the middle of the corporate performance distribution. However, moving into the right tail – delivering superior performance – was always a far greater challenge. From a valuation perspective, it meant a combination of higher expected growth and/or lower perceived risk. This required not only insightful strategy, but, far more important, a talented and inspired organization that was able to work together to share important information and quickly and effectively adapt as change undermined the original strategy's assumptions. My major disagreement with private equity proponents is their belief that the best way to generate this behavior is by providing management teams with the possibility of large monetary rewards. The first issue is the obvious one: if that upside potential isn't widely shared, it inevitably creates a destructive wedge between the leaders and the led. However, the second issue is more subtle, and in my experience more important: the available evidence suggests that the possibility of high rewards does not lead to better outcomes – in fact, it can lead to worse ones (see, for example, "Large Stakes and Big Mistakes" by Ariely, Gneezy, Loewenstein, and Mazar, and "Doing Good or Doing Well? Image Motivation and Monetary Incentives in Behaving Prosocially" by Ariely, Bracha, and Meier). From what I have seen over the years, organizations are far more likely to achieve superior performance when their members believe they are pursuing a shared and valued purpose (e.g., "improving the environment", "creating great customer experiences") than when they are simply trying to become rich – or, to use the frequently heard term, "maximize shareholder value." Organizations as diverse as high performing schools, special forces teams, and orchestras are filled with people who are inspired not by a desire to get rich, by rather the shared pursuit of a worthy purpose. If the realization of that purpose coincides with great monetary rewards, all the better. But on its own, I've never seen the desire to get rich produce a great company that has stood the test of

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time. Most human beings don't work that way. Unfortunately I'm not sure how many private equity partners fully grasp this. Maybe that is why a significant portion of the industry's historical returns seem to be based on a formula of making quick operational improvements to raise cash flow, leveraging up, and selling out a higher multiple. And maybe that is also why, now that the old game is over, so many of their firms are currently trading at a deep discount to their stated net asset values.

Interesting New Research

As regular readers know, one of our core assumptions is that financial markets are a complex adaptive system, in which a wide variety of investment strategies (e.g., value, momentum, indexing, and market making) constantly compete and evolve as investors make decisions on the basis of imperfect information, time pressure, emotions and social considerations. As a result, while markets are attracted to equilibrium and efficient pricing, they are seldom in this state; the supply of and demand for returns on different asset classes are not always in balance, and substantial overvaluations and undervaluations can occur. We have frequently noted that an important area of research is developing a better understanding of the agent/investor level behaviors that cause these macro-level effects to emerge. Coates and Herbert recently published a fascinating paper in the Proceedings of the National Academy of Sciences of the U.S.A. on this issue. "Endogenous Steroids and Financial Risk Taking on a London Trading Floor" reviews the impact of two hormones on traders' behavior and performance. "Testosterone mediates sexual behavior and competitive encounters. It rises, for example, in athletes preparing for a competition and rises even further in the winning athlete, while falling in the losing one. This priming of the winner can increase confidence and risk taking and improve chances of winning again, leading to a positive-feedback loop termed the 'winner effect.' Cortisol plays a central role in the physiological and behavioral response to physical challenge or psychological stressors. It is particularly sensitive to situations of uncontrollability, novelty and uncertainty." The authors found "a significant relationship between testosterone and

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financial return, and between cortisol and financial uncertainty, with the latter measured by both the variance of returns and of the overall market....When traders experienced acutely raised testosterone, they made higher profits, perhaps because testosterone has been found, in both animal and human studies, to increase search persistence, appetite for risk, and fearlessness in the face of novelty." However, prolonged exposure to elevated testosterone levels can have harmful effects, including "impulsivity and sensation seeking, harmful risk taking, euphoria and mania."

In contrast, "traders experienced elevated cortisol in anticipation of higher volatility." As with testosterone, while a temporary increase in cortisol can be beneficial, prolonged exposure to elevated levels can have harmful effects. Elevated cortisol "can increase motivation and promote more focused attention, as well as aid the consolidation and retrieval of important memories." However, "during periods of chronic stress, prolonged high cortisol levels can promote selective attention to mostly negative precedents, stimulated feelings of anxiety, and produce a tendency to find threat and risk where none exist." The authors note that testosterone and cortisol, "as they fluctuate with risk and return, may alter a trader's ability to make optimal decisions." At the macro level, "cortisol levels are likely to rise during a market crash and, by increasing risk aversion, to exaggerate the market's downward movement. Testosterone, on the other hand, is likely to rise in a bubble and, by increasing risk taking, to exaggerate the market's upward movement." Together, "these endocrine system feedback loops may help explain why people caught up in bubbles and crashes often find it difficult to make rational choices." The only thing we would add to this is that fact that other research has found that social relationships and reactions, as well as returns, can trigger heightened feelings of euphoria and fear. So the feedback loops involved are even more complex than those described by Coates and Herbert.

Still, the paper's findings align closely – and help to explain – findings in two other recent papers. In "Momentum Traders in the Housing Market", Piazzesi and Schneider study the evolution of consumer beliefs about future house prices during the recent boom, using the Michigan Survey of Consumer Attitudes. Their analysis "find that a small cluster of households always believes it is a good time to buy a house

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because prices will rise further." They also find that the size of this cluster had doubled by the end of the boom, reaching a 25 year high in the second quarter of 2005. Finally, they show how, in a market where volumes are low and prices are set in part based on references to recent transactions, the actions of even a small group of overoptimistic buyers can have an outsized impact on average house prices.

The second paper is "Expectations of Risk and Return Among Household Investors: Are Their Sharpe Ratios Countercyclical?" by Amromin and Sharpe. After also analyzing data from the Michigan Survey of Consumer Attitudes, they find that "expected future returns appear to be extrapolated from past returns" and that "expected risk and return are strongly influenced by respondents' perception of economic prospects. [For example] when investors believe macroeconomic conditions are expansionary, they tend to expect both higher returns and lower volatility." In other words, household investors' expectations are procyclical and wrong – a look at the historical data show that the highest returns are generally realized by investors who buy at the bottom of a market when, for example, dividend yields are highest. Yet this is exactly when household investors have the lowest expectation of future returns, and perceived risks are at their highest.

Another recent paper reinforces this point. In "Forecasting Stock Market Returns: The Sum of the Parts is More than the Whole", Ferreira and Santa-Clara start with the conclusions reached by Goyal and Welch in their paper "A Comprehensive Look at the Empirical Performance of Equity Premium Prediction", who test a wide range of predictors and find they do a poor job of forecasting future equity returns. Ferreira and Santa-Clara attempt to improve on this performance by using a simple dividend discount valuation model, and separately forecasting each of its components (the dividend yield, earnings growth, and changes in the price/earnings ratio).They forecast the future dividend yield using the currently observed dividend yield, earnings growth using its twenty-year moving average, and test a number of different approaches for predicting changes in the earnings multiple. We found it interesting that they use shrinkage estimators to improve their forecasting results, as that is the same approach we have advocated and use in constructing our model portfolios. Just

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as important, the authors find that "a considerable improvement in the out-of-sample forecasting performance comes just from forecasting the dividend yield and earnings growth separately" – the same approach that underlies our monthly asset class valuation updates. Finally, with respect to market multiples, and in line with the Coates and Herbert paper, the authors conclude that "it is remarkable how little of the time variation in the price-earnings ratio is captured by [changes in economic variables]. It seems the changes in the market multiple over time have little to do with the state of the economy." Hence, "the reversion of market multiples [to long term averages] is quite slow and at times takes almost ten years; as a result, the expected return coming from multiple reversion varies substantially over time and takes both positive and negative values."

Another paper we found interesting was "Predictability and Good Deals in Currency Markets" by Levich and Poti. They find that, between 1971 and 2006, periods of high and low predictability tend to alternate, which is consistent with the adaptive markets hypothesis. Another timely paper is "Wages and Human Capital in the U.S. Financial Industry: 1909 – 2006" by Phlippon and Reshef. They conclude that "wages in finance were excessively high around 1930 and from the mid 1990s until 2006 [the end of their sample]. However, "from the mid-1920s to the mid 1930s, and from the mid-1990s to 2006, the compensation of employees in the financial industry appears to be too high to be consistent with a sustainable labor market equilibrium." For the latter period, the authors "estimate that rents accounted for 30% to 50% of the wage differential between the financial sector and the rest of the economy." They also note that their "investigation reveals a very tight link between deregulation and human capital in the financial sector. Highly skilled labor left the financial sector in the wake of Depression era regulations, and started flowing back precisely when these regulations were removed. Deregulation apparently unleashed creativity and innovation [they cite aggregate IPO activity and credit risk] and increased the demand for skilled workers." In sum, the authors conclude that compensation in the financial services industry has been driven by a combination of deregulation, "creative destruction in the corporate sector, triggered by technological revolutions and the financing needs that result" and

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employees' ability to extract rents. Given these conclusions, it will be interesting to see how financial sector compensation evolves in the face of two competing forces: on the one hand, a wave of new regulation, and on the other, the increased financing and investing needs that will be triggered by the growing pace of change in nanotechnology, materials science, biotechnology and environmental technology.

We were also fascinated by "Fundamental Value Investors: Characteristics and Performance" by Gray and Kern, as it was like reading the findings of foreign anthropologists who have just studied a community you know well. The motivation of their research is that "real world value investors presumably drive asset prices to fundamental values, in contrast to technical traders or index investors. Therefore, studying fundamental value investors' thought process can help researchers understand why and how assets are priced empirically." A noble and common sense, goal, no doubt about that. The data set used by Gray and Kern is composed of all investment reports submitted to the Value Investors Club between 2000 and mid-2008. And what did our investigators find? "In our sample, value investors overwhelmingly focus on measures of intrinsic value: they examine valuation models based on discounted free cash flows, use various earnings multiple measures, and often search for growth at a reasonable price...They also favor the analysis of open market repurchases, net operating losses, spin-offs, turnarounds and activist involvement." However, "none of the investment theses [the authors] analyzed made use of the statistical asset pricing models found in the academic literature." In other words, "value investors are not focused on high book-to-market stocks, but instead on intrinsic value and signaling factors in the market...They tend to favor smaller stocks with a value bias for long positions and small growth stocks for short positions...[The authors} also find evidence that value investors reliably outperform the market" in spite of the fact that their thinking seems "fairly one dimensional" and that they "utilize only a few tools when making their investment decision." One can only imagine the reaction of Warren Buffett and Charlie Munger (or Ben Graham's ghost) if they ever read this paper.

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It was only after we read the paper on value investors that we came across a recent gem by Berger, Kabiller, and Crowell, titled "Is Alpha Just Beta Waiting to Be Discovered? What the Rise of Hedge Fund Betas Means for Investors" (it is published by AQR Capital Management). The authors begin by accurately noting that "colloquially, alpha has come to mean the excess returns from active management. But in truth, the concepts of alpha and beta have their roots in portfolio theory. Empirical analysis uses linear regression to decompose the returns of an asset or portfolio into two components. One component is beta, the portion of returns that can be attributed to one or more systematic risk factors. [At the portfolio level], most common risk factors (betas) have historically been traditional investments, like equity and bond markets. More recently, investors have broadened their portfolio analysis to include "exotic" betas, such as emerging market equities, commodities and real estate. The remaining component is alpha, the portion of returns that cannot be attributed to these various risk factors. At the level of a given equity, return beta factors might include not only exposure to the overall market, but also exposure to factors based on size, value, and momentum.

In other words, from a "statistical perspective, alpha is not returns from active management, but rather returns than cannot be explained by exposure to recognized risk factors. This in turn means that, as new risk factors are discovered and popularized, the portion of returns attributed to alpha decline, as part of alpha is reclassified as beta." In practice, what the discovery of a new risk factor often means is the creation of an index to measure and track it, and the creation of new low cost index investment products (e.g., futures, ETFs and mutual funds) that enable investors to gain exposure to it at a much lower cost than before (when it was considered part of more expensive alpha).

With this background, the authors proceed to describe how alpha can be further reduced by the use of new "hedge fund betas", which capture some of the basic risk exposures that underlie common hedge fund strategies. One example they use is merger arbitrage, a strategy that attempts to profit by going long the stock of the target of an announced but not yet closed deal, and short the stock of the acquirer. There

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are two schools of thought about why this strategy should be profitable. The first, noted by the authors, is that, not being sure the deal will close, some holders of the target company's stock will sell at less than the price of the deal. The second, not mentioned by the authors, is the fact that buyers are perceived to have overpaid, which drives down the price of their own stock. As the authors note, "the beta of merger arbitrage comes from capturing the risk premium that exists in the aggregate of all investable deals." The authors stress that, at this point, creating and capturing (via trading) these hedge fund betas requires quite a bit of skill.

For example, they note that "a key distinction between hedge fund betas and traditional betas relates to capacity. With any risk exposure, investors must understand the premium they expect to earn for bearing that risk. Any beta – from the most traditional to the most exotic – can become overcrowded [a synonym for "overvalued" or "likely to produce lower returns than you expect, or even losses"]." That said, the authors note that "hedge fund betas, which seek to exploit anomalies in global markets, inherently have limited capacity. If too much money seeks to exploit an anomaly, the anomaly will disappear and the expected returns from exploiting it will fall. Conversely, when capital moves out of a strategy, expected return will rise." As they note, "money tends to flow to different strategies not based on their expected risk premium, but rather on how well they have done in the recent past....This can lead to [situations] where strategies with little or no expected risk premium (due to recent strong performance) nonetheless attract the most capital, shrinking their expected return further, while strategies offering more risk premium (perhaps due to poor recent performance) see their investors flee" because they believe the strategy "is no longer working." In the authors view, this type of investor behavior makes rebalancing one's exposure to hedge fund betas critical, and an important part of the value added by firms like AQR.

As far as it goes, this is an excellent article, which is well worth reading. However, from our point of view, its initial dismissal of the "colloquial" meaning of alpha – returns derived from active management – glosses over some very important points. Whatever you choose to call it, there is a critical distinction between the

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returns that can be earned passively – that is, without having to make any forecasts – from simply investing in index products that track the performance of broadly defined asset classes, such as U.S. or developed market equities, fixed income, property, commodities and the like. To be sure, asset allocation at this level is not wholly passive, as we have frequently noted in these pages. For example, there are questions about how to define broad asset classes (i.e., the extent to which they represent overlapping exposures to underlying return generating processes, or, if you will, risk factors – say, liquidity, to use a current example). There are also important questions about how to properly measure the returns on these asset classes – for example, the right way to construct an index that tracks the economic performance of bond or commodity markets remains a controversial topic on which reasonable people can and do disagree. There are also questions about how much of each asset class to include in a portfolio, which is a function not only of an investor's goals, but also about the extent to which you believe it is possible to forecast – with a degree of accuracy beyond luck – either returns and/or risk (and we also note that there are plenty of arguments about how to best define the latter). Finally, there are questions about whether even a broad asset class can become so overvalued that a prudent investor should temporarily move out of it, and into either cash or another broad asset class that is fully or undervalued.

Given this, the colloquial distinction between beta and alpha – between returns from basically "passive" (though not completely decision and forecast free) allocations versus returns from "active" exposures that require more, and often more frequent, forecasts and decisions – is far from trivial. When you broaden the range of forecasts and decisions you have to make, you cannot help but increase the chance of error as you move further from the core of your expertise. Some will claim that this problem can be avoided by hiring an expert to provide advice on, or make, some or all of these decisions. Yet that simply shifts the nature of the forecasting and decision problem (which expert should we hire?), and does not eliminate it. Moreover, it also seems likely that the more decisions one has to make in a given period of time, the more likely limited attention and cognitive resources will lead to greater use of mental short

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cuts (heuristics) and (particularly where the stakes are high) greater influence of affective and hormonal factors that collectively raise the probability of error. In contrast to Grinold and Khan's "fundamental law of active management" (which links active returns to the accuracy of forecasts and the number of bets made), we believe that all the findings of decision research point towards an unavoidable trade-off between the two factors (a point also made by Richard and Robert Michaud in their article "The Fundamental Law of Mismanagement"). Moreover, we have also long noted that the superior models and/or information sources that underlie superior forecasts will inevitably be undermined by the ongoing evolution of the complex adaptive system that we call the economy, society, and financial market, which should also make one skeptical about the likely long term efficacy of an active management strategy. To cite an example we've used before, in their recent paper "False Discoveries in Mutual Fund Performance: Measuring Luck in Estimated Alphas", Barras, Scaillet, and Wermers show that only 0.6% of the 2,076 managers they studied produced skill-based alpha after costs were taken into account. And this does not include the negative impact front-end loads and taxes, which further worsen the performance of many actively managed funds.

On the other hand, we also recognize the substantial potential benefits that returns from a successful uncorrelated alpha strategy can provide to a portfolio. It is for that reason that we include an allocation to these strategies in most of our model portfolios. However, because of our well-founded doubts about the chances of successfully picking truly skilled active managers, and, even if we pick them right, our doubts about those managers retaining their edge over time, we limit the size of our uncorrelated alpha allocation and try to diversify it across a range of strategies.

New Products

The start of the year has seen a bumper crop of new product launches that caught our eye. Barclays has launched two new iPath Exchange Traded Notes (ETNs) that track futures contracts on the VIX index (which tracks the implied volatility

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of the S&P 500 Index). Both ETNs have .89% annual expense charges. The return on VXX comes from continuously rolling over the two closest month VIX futures contracts. The return on VXZ comes from rolling over contracts on the fourth, fifth, sixth and seventh month out VIX futures contracts. If this sounds complicated, it is. In some ways, these products are like the beauty contest described by John Maynard Keynes, where the object is not to pick the prettiest contestant, but rather the contestant that the greatest number of other people will judge most beautiful. As Keynes noted, "It is not a case of choosing those [faces] which, to the best of one's judgment, are really the prettiest, nor even those which average opinion genuinely thinks the prettiest. We have reached the third degree where we devote our intelligences to anticipating what average opinion expects the average opinion to be. And there are some, I believe, who practice the fourth, fifth and higher degrees" (Keynes, General Theory of Employment Interest and Money, 1936). Let's put this in more practical terms. We know that the VIX index rises when investors become more uncertain about the future. For example, in January 2009, the VIX rose by 11.21%. However, this is not the same thing as the change in investors' expectations for the future level of the VIX. In January, this increased by either 6.60% (for VXX, which measures expected changes in the VIX over the next two months) or 1.89% (for VXZ, which measures expected changes in the VIX during the period from four to seven months in the future).

Beyond the aforementioned cognitive challenge of using the VIX, there is also the fact that, over time, its expected return – that is, the change in implied volatility should be close to zero, leaving an average annual return equal to the implied expenses on these products – that is, an annual loss of 0.89%. For that reason, a decision as to whether to make a permanent allocation to these products or to instead use them tactically really comes down to one's expectations for the frequency of future uncertainty shocks. Finally, if one chooses to only invest in the VIX on a tactical basis (e.g., to hedge the risk of a jump in uncertainty), a more sophisticated investor would have to consider direct investment in VIX options and futures as an alternative to these products, which are debt obligations of Barclays Bank at a time when banks'

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creditworthiness is, shall we say, more open to question than is traditional in these matters. On balance, while we are very excited that these products have been introduced, and made investing in volatility much easier for retail investors, we also caution that a permanent allocation to them (and to volatility as an asset class) may not make sense for many investors.

We have been asked more times than we can count about our position on gold. Until now, our position has been that (a) gold as a financial investment is already included in most commodity index funds; and (b) gold as means of diversifying one's liquid reserves is better held in physical form, ideally in coins that, in the worst case scenario – e.g., if financial markets are closed – can be used as a means of exchange. Hence, we have been big fans of Maple Leafs, Eagles, Buffaloes, Kangaroos and Krugerrands (also known as the menagerie in the safety deposit box). However, Bank Julius Baer has recently introduced a series of ETFs that have, shall we say, broadened our thinking on this issue. These ETFs have very reasonable annual expenses (.40%), trade on the Swiss Exchange (www.swx.com), are based on the price of one ounce of gold, and are denominated in Euro, Swiss Francs, and U.S. Dollars to avoid exposure to both currency and commodity risk. Most interesting of all, this ETF offers the option of being redeemed not just in cash, but also in physical gold. The ticker for the USD redeemable ETF (note that they also come in a version that is not redeemable in physicals) is JBGOUA.SW. It goes without saying that the physical redemption process is bound to be more complicated than simply opening up your safety deposit box. But we are still very impressed with this product, which, for example, could be used to implement a tilt within one's allocation to commodities, as well as to implement diversification of one's precautionary savings. While Zurcher Kantonalbank has offered a similar ETF product (ZGLD.SW) for a number of years, it was largely aimed at institutions, and only traded in Swiss Franc denominated shares. The Julius Baer product is the first that makes this strategy available to retail investors.

While we are on the subject of tilts within one's allocation to commodities, we should also briefly touch on oil. As we note in this month's feature article, there are very strong reasons to believe that current oil prices represent a low point that will

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quickly reverse once economic demand picks up again. The large recent inflows into ETFs like USO show that we aren't the only ones holding this view. However, we have some very big reservations about USO as a way to take an active view on future oil prices. The underlying return generating mechanism for USO is the rolling over of near month oil futures contracts. As we have noted before, the sharp fall in demand for oil and the filling up of storage tanks (and tankers used for storage), along with producers continuing need to generate cash has combined to drive spot prices down to a significant discount versus futures. In technical terms, this has created a steep contango, which creates significant losses for commodity funds that are based on selling maturing contracts and using the proceeds to buy contracts with longer maturities. However, unlike USO, another oil futures based fund (USL) is based on taking and rolling positions not just in the near month contract, but in contracts for each of the next twelve months. As we noted in the case of the new VIX products, the latter structure appears to moderate price swings. For example, in January, USO was down by (11.72%), while USL lost only (2.71%). If you assume that the future upward move in oil prices will affect every contract, then it makes more sense to use USL to limit downside losses until that upward move materializes than it does to use USO. While the annual expenses on USL are slightly higher than those on USO (.60% versus .50%), it seems a small price to pay for the additional downside risk protection you receive.

In an earlier product and strategy note, we reviewed a paper on hedge fund beta that was recently published by AQR Capital. This firm has also recently introduced a new mutual fund, the AQR Diversified Arbitrage Fund (ticker ADANX, $5,000 minimum investment, 2.32% annual expense charge, which is temporarily capped at 1.50%). The fund will invest in a range of arbitrage strategies, including merger, convertible, dual class, stub, when-issued, and distressed securities. In theory, the fund should produce returns with a relatively low correlation of returns with those on major asset classes, and for this reason represents a very interesting new investment alternative for retail investors. Hence, for 2009 we are including it in the

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group of funds we will use to track the performance of our model portfolios' allocation to uncorrelated alpha strategies.

A long time ago, in a galaxy far, far away, people used to write to us and ask why on earth we had included an allocation to foreign currency bonds in our model portfolios. Judging from the number of new product launches in this area in recent months, it would appear that more people are coming around to our view on this issue. For example, SSGA has launched a new ETF (BWZ, annual expenses .35%) that invests in bonds with maturities of one to three years (recent duration is 1.66 years) issued by a mix of developed and emerging market governments. This complements the previously issued BWX, which invests in longer maturity bonds from the same issuers (annual expense .50%, recent duration 6.21 years). Not to be outdone, Barclays has launched two new ETFs that directly compete with the ones from SSGA. ISHG (.35% expenses, recent duration 1.8 years) invests in government bonds with a maturity of one to three years issued by a mix of developed country issuers tracked by the S&P/Citigroup 1 – 3 Year International Treasury Index. Major currency exposures are 56% Euro, 25% Japanese Yen, 5% each UK Pounds and Canadian Dollars. IGOV (.35% expenses, recent duration 6.3 years) invests in longer maturity bonds from the same mix of issuers. On balance, we prefer ISHG, because of its short duration (with money supply growth exploding, which seems likely to lead to higher future inflation, this doesn't strike us as a great time to be taking duration risk) and because it does not include emerging market bonds, which, as we have noted in the past, we believe offer an inferior risk/return tradeoff in comparison to emerging markets equities. We also believe that these new products offer superior value to international bond mutual funds, such as RPIBX (expenses of .82% and recent duration of 6.6 years) and PFUAX (expenses of 1.23% and recent duration of 7.7 years).

The biggest news on the fixed income front, however, was PIMCO's launch of a new global bond index and a mutual fund that tracks it. Way back in our December 2004 issue, we wrote about the shortcomings of many of the then existing indexes that claimed to measure the performance of fixed income markets. With its new "Global Advantage Bond Index" ("GLADI"), PIMCO has addressed many of our concerns.

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First, the GLADI uses GDP weighting, which avoids giving too much emphasis to potentially irresponsible borrowers who are issuing large amounts of debt. Moreover, if one assumes that changes in bond prices and yields lead changes in GDP (e.g., with yields falling and prices rising in advance of faster GDP growth), then the construction of the GLADI may generate incremental returns from the "buying low and selling high" over the course of national business cycles. Within currency zone allocations, the GLADI is divided between real return bonds (where available), government bonds, corporate bonds, and asset backed bonds. This enables it to capture the full range of risk premia, including those that compensate for uncertainties about duration risk (a function of both real rates and inflation), default risk, and prepayment risk. PIMCO, notes, rightly in our view, that "in the absence of a robust theoretical or empirical rationale for departing from a parsimonious equal weighting of each of these factors, this is adopted as the preferred weighing scheme within a given currency zone allocation." Finally, when it comes to security selection, the GLADI uses another set of criteria, including the requirement that all included bonds must have an investment grade rating and that the mix of bonds reflects the maturity and industry mix of issuers in a given market. Overall, this methodology results in an index with global coverage, an average rating of AA-, and average duration of 4.5 years. In terms of currency exposures, the GLADI is approximately 34% US Dollar, 26% Euro, 10% Yen, 12% other industrial countries (e.g., Australia, 1%, Canada, 4%, Denmark .6%, Norway,.2%, New Zealand, .1%, Sweden, 1%, Switzerland, 1% and the U.K, 4%.), and 18% in emerging markets. In sum, we believe that the GLADI is a better measure of the performance of the global fixed income markets than existing indices. The new fund that tracks the GLADI is known as the PIMCO Global Advantage Strategy Bond Fund, or PSAIX. Annual expenses are a rather hefty 1.45%, and, depending on where you buy it, you may also have to pay a front end load of up to 3.75%. While we believe the GLADI index will provide a good benchmark, we are less enthusiastic about this fund, as the underlying mix of fixed income allocations may not be optimal for many investors. On the other hand, the introduction of this fund now makes it possible for an investor to achieve a very widely diversified portfolio with only three or

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four investments, including PSAIX, VT (the Vanguard ETF that tracks global equity markets, and charges only .25% of annual expenses), RWO (the SSGA ETF that tracks the global property market, with annual expenses of .50%) and LSC, the Elements S&P Commodity Trends Indicator ETN (annual expenses .75%). To roughly line up with global market weights, the portfolio proportions would be PSAIX 50%, VT, 30%, RWO, 12% and LSC, 8%.

Changes to our Uncorrelated Alpha Allocation

We have recently undertaken a review of the list of funds we have been using to implement the allocations to uncorrelated alpha strategies in our model portfolios, in light of the growing number of retail products available in this space. To cite but one example, PIMCO recently introduced its Fundamental Advantage Total Return Strategy Fund (PTFAX, expenses 1.29% per year, and a front end load of up to 3.75%). What makes this fund particularly interesting is its underlying construction. Using futures and swaps, it takes a long position in the RAFI 1000 Fundamental Index and an offsetting short position in the S&P 500. Because these derivative positions cost a fraction of the face value, the remaining funds are invested in an actively managed portfolio of low to medium duration bonds. In our view, this represents a clear and welcome sign that a new age is arriving for retail investors, in which they will be able to pay low prices for passively obtained returns on broad asset classes, while only paying higher fees in exchange for the promise of uncorrelated returns. Granted, this does not eliminate, and in fact may only aggravate the issues raised in the AQR paper noted above with respect to the "overcrowding" of some strategies, and the resulting reduction in their expected returns. When it comes to active strategies, there is no escaping the need to make forecasts and the chance they could be wrong. Yet the clear split between passive and uncorrelated active returns is a very welcome development.

To implement our model portfolios' allocation to uncorrelated alpha in 2009, we will be using ten funds, with two each in five uncorrelated alpha strategies. While it

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may not be possible for an investor to efficiently invest in all of them (given the fund minimums in relation to the size of an overall portfolio), we believe that it will be of interest to our readers to see how each of them performs. Two funds are based on an equity market neutral strategy. In the past, we have used OGNAX and JAMNX. After a review of the alternatives, this year we will replace JAMNX with the JP Morgan Highbridge Statistical Market Neutral fund (HSKAX, 1.95% expenses, average three year return 5.10%, three year correlation with S&P 500, .04). The minimum investment in HSKAX is high, at $10,000, while OGNAX is lower, at $1,000 minimum, and annual expenses of 1.75%. The next two funds are based on variety of arbitrate strategies, as noted earlier in our description of ADANX, the new fund from AQR ($5,000 minimum, 1.50% annual expenses), which is one of the funds we will use. The other is ARBFX, which has a longer track record (average three year return of 4.05%), and a higher correlation with the S&P 500 (.33 over the past three years). However, it is a no-load fund, with a $2,000 minimum investment and annual expenses of 1.90%.

In addition to DBV, we will be adding ICI, and iPath Exchange Traded Note as our second currency carry strategy. At .65%, its annual expenses are lower than those on DBV (.81%). However, as a debt obligation of Barclays Bank, ICI also carry's more credit risk than DBV. In the long/short equity category (which may have a higher correlation with equity market returns than strategies that are explicitly market neutral), we will continue to use HSGFX (no load, 1.11% annual expenses, -.06 three year average return, .14 correlation with S&P 500) as well as PTFAX.

Our last strategy is global tactical asset allocation, which aims to generate uncorrelated returns by well-timed shifts between asset classes. The first fund we will use in this category is the BlackRock Asset Allocation Fund, (MDLOX). Over the past three years, it had an average return of 2.4% and a .75 correlation with the S&P 500. Annual expenses are 1.18% and the minimum investment is $1,000. The second fund is PIMCO's All Asset (PASAX). Over the past three years its average annual return was (1.7%), with a .75 correlation with the S&P 500. Minimum investment is $1,000, with annual expenses of 1.58%. PIMCO also offers another fund, All Asset All

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Authority (PAUAX) that uses leverage to further increase the returns from its tactical asset allocation strategy. Over the past three years, its average return was .01%, with a .51 correlation with the S&P 500. However, its annual expenses are much higher, at 3.58% per year.

And a Change to Our Commodities Allocation

After further review and consideration, we are changing the product we use to implement our allocation to commodities. In the past, we have used "long only" products that track the DJAIG index – either DJP (an exchange traded note that has Barclays Bank credit risk) or PCRDX, a mutual fund from PIMCO. However, we are now convinced that a systematic long/short approach is a more logical way to invest in commodities markets (as we described in last month's product and strategy notes). Hence, in 2009 we will use LSC, an exchange traded note that tracks the S&P Commodity Trends Indicator Index. Annual expenses are .75%. There is also a mutual fund (DSCTX) that tracks this index; however, with a minimum investment of $25,000 and annual expenses of 1.84%, LSC seems to offer more value. Some readers will undoubtedly raise the issue of the underlying HSBC credit risk exposure. On 19 January 09, HSBC issued a press release that included the following language: "HSBC has not sought capital support from the UK government and cannot envisage circumstances where such action would be necessary. HSBC has long been one of the world's most strongly capitalised banks and is committed to maintaining this position." Given, this, and the potential benefits of the long/short approach to commodity investing, we are comfortable with the LSC product.

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

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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 equity market neutral (uncorrelated alpha) funds as a possible investment. These assume that an investor is primarily investing in index funds, but is willing to allocate up to ten percent of his or her portfolio to equity market neutral investments.

We use two benchmarks to measure the performance of our model portfolios. The first is cash, which we define as the yield on a one year government security purchased on the last trading day of the previous year. For 2009, our CAD cash benchmark is 2.00% (in nominal terms). The second benchmark we use is a portfolio equally allocated between the ten asset classes we use (it does not include equity market neutral). This portfolio assumes that an investor believes it is not possible to forecast the risk or return of any asset class. While we disagree with that assumption, it is an intellectually honest benchmark for our model portfolios’ results.

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

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