

The Index Investor

Invest Wisely... Get an Impartial Second Opinion.

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This Month's Issue: Key Points

October is usually the month when we review the latest “Global Financial Stability Report” and “World Economic Outlook” published by the International Monetary Fund, and compare them to our own scenarios. This year, however, events have evolved so rapidly that these publications are already a bit out of date. For that reason, our summary of their contents is brief – the baseline outlook is for a sharp slowdown in global growth, with substantial downside risks of a much longer and deeper recession. We review our two short-term scenarios, one characterized the cooperative solutions and a shallower decline, and the other by higher levels of conflict and prolonged stagnation. After reviewing critical uncertainties surrounding the future actions of the American middle class, Chinese peasants and Iranian youth, along with Russia, a new source of conflict, we conclude that a deep recession is the likely, but not yet unavoidable outcome. Given this outlook, our asset allocation advice remains unchanged. As we have been saying since May 2007, the first order of business for all investors is to ensure the adequacy of their liquidity reserves. Beyond that, we are strong believers in the proposition that investors can improve their risk/return tradeoff over time by following a disciplined approach to rebalancing that involves (1) automatically considering adjustments to asset class weights when a trigger based on a maximum allowable divergence of

an actual weight from a target weight (e.g., 2.5% or 5%) is exceeded; and (2) taking current asset class valuations into account, with a specific objective of reducing exposure to substantially overvalued asset classes. In other words, we believe in reducing asset class exposures when either they exceed target and the risk of large losses) becomes substantial. To repeat a point we cannot make too often: when it comes to achieving long-term financial goals, the avoidance of large losses is far more important than obtaining a few more basis points of return. On the other side, we believe in increasing asset class exposures when they fall short of target weights by a trigger amount, provided that the asset class in question does not appear to be substantially overvalued at the time. At a time like this, adherence to this approach is not easy. Yet we continue to believe it is the key to long-term investment success.

Elsewhere in this month's issue, we review the year-to-date performance of our model portfolios, and compare them to a number of benchmarks, including the equally weighted portfolio and three combinations of domestic bonds and equities. In general, our model portfolios have avoided the worst of the damage caused by the Category 5 hurricane that has been sweeping through the world's economy and financial markets. We also explore the analogy between the "normal accidents" that occur in tightly coupled, complex engineering systems, and recent financial markets developments. We conclude that the financial services industry could learn some valuable lessons from chemical plant operators. We also look at a number of new products that promise to give retail investors access to the returns on a broad hedge fund index. We believe they are best avoided, since merely wrapping a product in the "hedge fund" banner does not make it an uncorrelated alpha strategy. Finally, we take a closer look at the balance between the demand for and supply of returns from investing in commodity futures-based index products, and how they change depending on underlying supply and demand conditions.

This Month's Letters to the Editor

Can you explain again why you like Australian and Canadian real return bonds? Is it easy for non-residents to invest in them?

In the past, we have asked a simple question: what criteria should an investor use to identify the “risk free” asset that plays such an important role in asset pricing theory. The traditional answer was short term government debt. However, traditional, nominal return government debt still left an investor with exposure to the risk that future inflation would be different from the rate assumed in the nominal yield. Because it eliminated this risk, the growing issuance of real return government debt has led us to treat this as the risk free asset in our analyses, at least for investors whose liabilities are denominated in the currency of the government issuing the inflation linked (i.e., real return) bonds. However, we also live in an age when it is easy to move capital across borders, and some investors may have liabilities denominated in a mix of currencies. This caused us to ask ourselves if and why one country’s real return bonds might be preferable to another’s.

One of the criteria we have used is issuers’ comparative total factor productivity growth and natural resource endowments. On the other side of the balance sheet, so to speak, we have looked at how governments have dealt with the twin problems of future liabilities for state provided pensions and healthcare. In comparison to the United States, Australia and Canada have experienced slower productivity growth in recent years; on the other hand, relative to the size of their populations, they are richly endowed with natural resources whose value seems likely to substantially increase in the years ahead. On the liability side, Australia has, in our view, made more progress than any other developed country toward limiting the growth of its pension and healthcare liabilities. Canada has made quite a bit of progress on healthcare (i.e., it has a national healthcare system, but has not introduced as many efficiency enhancing reforms as Australia), but lags behind in the pensions area (i.e., unlike Australia, it has not made contributions to defined contribution pension plans mandatory). The United States still lags far behind both countries in taking steps to limit the size of these liabilities, and as a result faces considerably more budget risk (which could eventually lead to higher inflation and currency depreciation). However, for all their attractions, the markets for Australian and Canadian real return bonds are far smaller than the market for U.S. TIPS; which limits their widespread use as a proxy for the risk free asset. But this does not mean that an individual investor might still want to use Australian and Canadian real return bonds for this purpose. In the case of the latter, this is easy to do. XRB is a Canadian real return bond ETF that trades on the Toronto Stock Exchange, which makes it relatively easy for foreign investors to buy. Unfortunately, a similar

ETF does not yet exist in Australia, where only mutual funds (e.g., the UBS Inflation Linked Bond Fund) are available in this asset class. Another alternative might be one of the multicurrency real return bond ETFs that have recently been launched. We are, however, not strong supporters of these products because of the wide range of issuers they contain. Finally, an investor could try to buy these bonds directly; however, given the very high transaction costs for retail bond investors, this would likely be a very expensive route to take.

Any thoughts on how the financial services industry is likely to evolve as a result of the current crises?

A lot has been written already on this topic, by us and by others (see, for example, last month's issue, and this month's product and strategy note on how to prevent the "normal accidents" that can easily occur in tightly coupled, non-linear systems like chemical plants and financial markets). However, what hasn't really been aggressively addressed so far is how various aspects of retail financial services may change. Clearly, there is a need for much tighter regulation, not just of mortgage brokers and underwriters, but also of the real estate agents and appraisers whose advice influenced homebuyers' decisions, and who have for years escaped the types of suitability or fiduciary responsibility based regulations that govern the behavior of securities brokers and financial advisers. We also expect to see this crises stimulate the development of new products that enable people to better manage their exposure to residential house price risk. This could take many forms, from shared appreciation mortgages, to further use of Case-Shiller housing futures to some of the more creative ideas that have arisen in the past (and which we've written about) for restructuring the home purchase transaction so that it provides exposure not just to a single property, but to residential housing as an asset class. Inevitably, that will also lead to a better integration of housing into asset allocation analyses (again, a subject we've written about in the past). If the recession we're entering is deep enough and long enough, we might also see the development (logically, with government support) of better labor income insurance products, and perhaps the integration of labor income risk into asset allocation methodologies, beyond the current focus on the adequacy of life insurance coverage. Given the hit that many people's retirement savings accounts have just taken, we would also expect more countries to consider following the Australian example, and make payments into defined contribution pension plans mandatory for

all employees. Of course, that raises questions about how those funds should be invested (personally, we prefer the approach used in the U.S. Federal Government's defined contribution plan – allocation across a range of broadly defined, very low cost asset class index funds), and the extent to which annuitization at retirement should also be mandatory.

Last but certainly not least, we admit to being stunned by the number of people we know or have read about who have remained heavily invested in equity, despite growing evidence that this asset class was overvalued, arguably by a substantial amount. We suspect that more than a few of these people have angrily called their brokers and advisers and demanded to know why they weren't warned about the risks or the dangers that were coming. Granted, we all know that perfect foresight is impossible, and perfect hindsight can be a dangerous blessing. But in this case, even imperfect foresight provided some pretty strong hints that trouble was on the horizon. So at some point, brokers and advisers are going to have to ask themselves what it will take to regain the client trust that they have lost. We hope that the answer will involve more prudent advice, based on the use of a wider range of asset classes, and a much tighter focus on what people are actually paying for beta and alpha returns. We hope this will lead to broader adoption of the investment policies we have long advocated in these pages. Unfortunately, experience has also shown us how just the opposite can happen – big losses can lead not to higher savings and more prudent investment behavior, but rather to an even stronger desire to make it all up with a single big score – and easy prey for the financial services industry's unscrupulous players, for whom the concept of fiduciary duty will at best remain a mystery and at worst be held in contempt. Hopefully, a big crisis will produce some equally big and long overdue changes. Time will tell.

Global Asset Class Returns

YTD 30Sep08	<u>In USD</u>	<u>In AUD</u>	<u>In CAD</u>	<u>In EURO</u>	<u>In JPY</u>	<u>In GBP</u>	<u>In CHF</u>	<u>In INR</u>
Asset Held								
US Bonds	0.64%	10.80%	7.81%	4.57%	-4.59%	11.09%	-0.33%	16.72%
US Prop	1.80%	11.96%	8.97%	5.73%	-3.43%	12.25%	0.83%	17.88%
US Equity	-18.52%	-8.36%	-11.35%	-14.59%	-23.75%	-8.07%	-19.49%	-2.44%
AUS Bonds	-0.87%	9.29%	6.29%	3.05%	-6.10%	9.58%	-1.85%	15.20%
AUS Prop	-42.62%	-32.47%	-35.46%	-38.70%	-47.85%	-32.17%	-43.60%	-26.55%
AUS Equity	-28.73%	-18.57%	-21.56%	-24.80%	-33.96%	-18.28%	-29.70%	-12.65%
CAN Bonds	-5.22%	4.94%	1.94%	-1.30%	-10.45%	5.23%	-6.20%	10.86%
CAN Prop	-18.72%	-8.56%	-11.55%	-14.79%	-23.95%	-8.26%	-19.69%	-2.64%
CAN Equity	-20.47%	-10.31%	-13.31%	-16.55%	-25.70%	-10.02%	-21.44%	-4.39%
Euro Bonds	-1.20%	8.96%	5.96%	2.72%	-6.43%	9.25%	-2.18%	14.88%
Euro Prop.	-22.84%	-12.68%	-15.68%	-18.92%	-28.07%	-12.39%	-23.82%	-6.77%
Euro Equity	-33.42%	-23.26%	-26.26%	-29.50%	-38.65%	-22.97%	-34.40%	-17.35%
Japan Bnds	5.52%	15.68%	12.69%	9.45%	0.30%	15.98%	4.55%	21.60%
Japan Prop	-27.47%	-17.31%	-20.30%	-23.54%	-32.70%	-17.02%	-28.44%	-11.39%
Japan Eqty	-19.79%	-9.63%	-12.62%	-15.86%	-25.02%	-9.34%	-20.76%	-3.71%
UK Bonds	-9.40%	0.76%	-2.23%	-5.47%	-14.62%	1.06%	-10.37%	6.68%
UK Prop.	-9.86%	0.30%	-2.70%	-5.94%	-15.09%	0.59%	-10.84%	6.22%
UK Equity	-30.86%	-20.70%	-23.69%	-26.93%	-36.08%	-20.40%	-31.83%	-14.78%
World Bnds	-1.02%	9.14%	6.15%	2.91%	-6.25%	9.43%	-1.99%	15.06%
World Prop.	-23.84%	-13.68%	-16.67%	-19.91%	-29.07%	-13.39%	-24.81%	-7.76%
World Eqty	-23.87%	-13.71%	-16.70%	-19.94%	-29.09%	-13.41%	-24.84%	-7.79%
Commod	-8.34%	1.82%	-1.18%	-4.41%	-13.57%	2.11%	-9.31%	7.74%
Timber	8.75%	18.91%	15.91%	12.67%	3.52%	19.20%	7.77%	24.82%
EqMktNtrl	-8.42%	1.74%	-1.25%	-4.49%	-13.64%	2.04%	-9.39%	7.66%
Volatility	75.07%	85.23%	82.23%	78.99%	69.84%	85.52%	74.09%	91.14%
Currency								
AUD	-10.16%	0.00%	-2.99%	-6.23%	-15.39%	0.29%	-11.13%	5.92%
CAD	-7.17%	2.99%	0.00%	-3.24%	-12.39%	3.29%	-8.14%	8.91%
EUR	-3.93%	6.23%	3.24%	0.00%	-9.15%	6.53%	-4.90%	12.15%
JPY	5.23%	15.39%	12.39%	9.15%	0.00%	15.68%	4.25%	21.31%
GBP	-10.45%	-0.29%	-3.29%	-6.53%	-15.68%	0.00%	-11.43%	5.62%
USD	0.00%	10.16%	7.17%	3.93%	-5.23%	10.45%	-0.97%	16.08%
CHF	0.97%	11.13%	8.14%	4.90%	-4.25%	11.43%	0.00%	17.05%
INR	-16.08%	-5.92%	-8.91%	-12.15%	-21.31%	-5.62%	-17.05%	0.00%

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 May, 2005 issue, people can and 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 $(\text{Current Dividend Yield} \times 100) \times (1 + \text{Forecast Productivity Growth})$ divided by $(\text{Current Yield on Real Return Bonds} + \text{Equity Risk Premium} - \text{Forecast Productivity Growth})$. Our valuation estimates are shown in the following tables, where a value greater than 100% implies overvaluation, and less than 100% implies undervaluation. In our view, the greater the number of scenarios that point to overvaluation or undervaluation, the greater the probability that is likely to be the case.

Equity Market Valuation Analysis at 30 Sep 2008

<i>Australia</i>	Low Demanded Return	High Demanded Return
High Supplied Return	42%	68%
Low Supplied Return	65%	93%

<i>Canada</i>	Low Demanded Return	High Demanded Return
High Supplied Return	94%	144%
Low Supplied Return	156%	217%

<i>Eurozone</i>	Low Demanded Return	High Demanded Return
High Supplied Return	53%	81%
Low Supplied Return	80%	111%

<i>Japan</i>	Low Demanded Return	High Demanded Return
High Supplied Return	86%	142%
Low Supplied Return	154%	225%

<i>United Kingdom</i>	Low Demanded Return	High Demanded Return
High Supplied Return	29%	58%
Low Supplied Return	54%	86%

<i>United States</i>	Low Demanded Return	High Demanded Return
High Supplied Return	106%	161%
Low Supplied Return	177%	244%

<i>Switzerland</i>	Low Demanded Return	High Demanded Return
High Supplied Return	39%	75%
Low Supplied Return	73%	186%

<i>India</i>	Low Demanded Return	High Demanded Return
High Supplied Return	39%	120%
Low Supplied Return	130%	243%

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 the historical average inflation premium (the difference between nominal and real bond yields) between 1989 and 2003. 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 30Sep08

	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	2.00%	2.96%	4.96%	5.39%	0.44%	-4.05%
Canada	2.27%	2.40%	4.67%	3.77%	-0.90%	9.03%
Eurozone	2.39%	2.37%	4.76%	4.04%	-0.72%	7.12%
Japan	1.77%	0.77%	2.54%	1.48%	-1.06%	10.94%
UK	1.01%	3.17%	4.18%	4.46%	0.28%	-2.67%
USA	2.43%	2.93%	5.36%	3.84%	-1.52%	15.59%
Switz.	1.14%	2.03%	3.17%	2.74%	-0.43%	4.27%
India	1.22%	7.57%	8.79%	8.32%	-0.47%	4.42%

*Derived from ten year yield and forecast inflation

It is important to note some important limitations of this analysis. First, it uses the current yield on real return government bonds (or, in the cases of Switzerland and India, the implied real yield if those bonds existed). Over the past forty years or so, this has averaged around 3.00% in the United States. Were we to use this rate, the required rate of return would generally increase. Theoretically, the “natural” or equilibrium real rate of interest is a function of three variables: (1) the expected rate of multifactor productivity growth (as it increases, so should the demand for investment, which, given a fixed amount of saving, will tend to raise the real rate); (2) risk aversion (as investors become more risk averse they save more, which should reduce the real rate of interest, all else being equal); and (3) the time discount rate, or the rate at which investors are willing to trade off consumption today against consumption in the future. A higher discount rate generally reflects a greater desire to consume today rather than waiting (as consumption today becomes relatively more important, savings decline, which should cause the real rate to increase). However, in the case of a so-called “uncertainty shock” (see “The Impact of Uncertainty Shocks” by Nicholas Bloom), a sharp rise in the time discount rate might also reflect a desire to hold greater than normal amounts of cash. The stability of risk aversion and the time discount rate, and the relationship between them, remain subjects of great controversy

in economics. Clearly, investor behavior varies across individuals within in a single period, and over time for both individuals and groups. The controversial issue is what exactly it is that motivates the observed changes in behavior – is it a change in risk preferences, in the time discount rate, or both (in which case, it is generally thought the two preferences are negatively correlated, with rising risk aversion associated with a longer time horizon and thus a lower time discount rate).

All three of these variables can only be estimated with uncertainty. For example, a time discount rate of 2.0% and risk aversion factor of 4 are considered to be average, but studies show that there is wide variation within the population and across the studies themselves. The analysis in the following table starts with current real return bond yields and the OECD's estimates of total factor productivity growth between 1995 and 2002 (with France and Germany proxying for the Eurozone). We assume that risk aversion is constant across time, and that changes in observed real bond yields reflect changes in the time discount rate. Given risk aversion and expected total factor productivity growth, as well as the observed yield on real return bonds, we can then back out the time discount rate (hence the change in the real interest rate from month to month is equal to the change in the underlying time discount rate).

Real Interest Rate Analysis at 30Sep08

Currency Zone	AUD	CAD	EUR	JPY	GBP	USD
Risk Aversion	4.0	4.0	4.0	4.0	4.0	4.0
TFP Growth	1.60%	1.20%	1.40%	0.60%	1.40%	1.40%
Actual Real Rate	2.00%	2.27%	2.39%	1.77%	1.01%	2.43%
Estimated Time Discount Rate This Month	1.60%	1.97%	2.04%	1.62%	0.66%	2.08%
Time Discount Rate Last Month	1.85%	1.26%	1.93%	1.06%	0.33%	1.47%
<i>Change</i>	<i>-0.25%</i>	<i>0.71%</i>	<i>0.11%</i>	<i>0.56%</i>	<i>0.33%</i>	<i>0.61%</i>

As you can see, the past month has seen a substantial increase in real rates in all regions but Australia (which would appear to confirm the “no worries, mate” attitude that makes the latter such an attractive place). Our interpretation is that this reflects the impact of an uncertainty shock and a consequent increase in the demand for liquidity. A possible alternative explanation is an anticipated fall in the global supply of savings, which logically would be

driven by an increase in Chinese consumption. However, the latter seems a much more tenuous explanation than the serious shocks that hit the world's financial system over the past six weeks. Our expectation is that in the near term real rates should fall, for two reasons. First, the uncertainty shock should dissipate relatively quickly, assuming the success of government interventions to support the banking system. Second, this should focus investor's attention on declining consumer spending in the United States, and investment spending around the world. Absent a clear indication that global savings will decline by a greater amount (e.g., due to a rise in Chinese consumption spending and/or a sharp fall in oil prices), this expected fall in investment spending should cause real rates to decline. Finally, we also expect yields on real return bonds to decline as investors bid up their price, after realizing that the long term implication of the current government interventions is likely to be higher inflation.

Our bond market analysis also 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 average future inflation levels. For example, if expected future inflation is lower than historical inflation, required returns will be lower. All else being equal, this would reduce any estimated overvaluation or increase any estimated undervaluation. For example, if one were to assume a very different scenario, involving a prolonged recession, accompanied by deflation, then one could argue that government bond markets are actually undervalued today.

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 BBB and AAA rated bonds, which may tell us more about the level of compensation required by investors for bearing 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 BBB-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 average level of these spreads between January, 1970 and December, 2005 (based on monthly Federal Reserve data), along with their standard deviations and 67% (average plus or minus one standard deviation) and 95% (average plus or minus two standard deviations) confidence range (i.e., based on historical data, 95% of the time you would expect the current spreads to be within two standard deviations of the long term average).

	AAA – 10 Year Treasury	BBB-AAA
Average	.97%	1.08%
Standard Deviation	.47%	.42%
Avg. +/- 1 SD	1.44% - .50%	1.51% - .66%
Avg. +/- 2 SD	1.91% - .03%	1.93% - .23%

At **30 September 2008**, the AAA minus 10 year Treasury spread was 1.92%. This is two standard deviations above the long-term average compensation for bearing liquidity and jump risk (assuming our model is correct), and reflects continuing and severe investor concerns about the problems that have roiled the fixed income markets since August 2007 and have yet to fully abate.

At the end of the month, the BBB minus AAA spread was 1.86%. This is also about two standard deviations above the long-term average compensation for bearing credit risk. However, as conditions in the real economy continue to deteriorate, it is hard to believe that this represents excessive compensation for bearing credit risk under the current circumstances..

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. That is what we have chosen to do here. Specifically, 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:

Annual Exchange Rate Changes Implied by Bond Market Yields on 30Sep08

	To AUD	To CAD	To EUR	To JPY	To GBP	To USD	To CHF	To INR
From								
AUD	0.00%	-1.62%	-1.35%	-3.91%	-0.93%	-1.55%	-2.65%	2.93%
CAD	1.62%	0.00%	0.27%	-2.29%	0.69%	0.07%	-1.03%	4.55%
EUR	1.35%	-0.27%	0.00%	-2.56%	0.42%	-0.20%	-1.30%	4.28%
JPY	3.91%	2.29%	2.56%	0.00%	2.98%	2.36%	1.26%	6.84%
GBP	0.93%	-0.69%	-0.42%	-2.98%	0.00%	-0.62%	-1.72%	3.86%
USD	1.55%	-0.07%	0.20%	-2.36%	0.62%	0.00%	-1.10%	4.48%
CHF	2.65%	1.03%	1.30%	-1.26%	1.72%	1.10%	0.00%	5.58%
INR	-2.93%	-4.55%	-4.28%	-6.84%	-3.86%	-4.48%	-5.58%	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. However, our analysis is hindered by a lack of historical data about rates of dividend growth on commercial property securities. To overcome this limitation, we have assumed that markets are fairly valued today (i.e., the expected supply of returns equals the expected returns demanded by investors), and "backed out" the implied future real growth rates for dividends (which over time should correlated with the real change in rental income) to see if they are reasonable in light of other evidence about the state of the economy (see below). This analysis assumes that investors require a 2.5% risk premium above the yield on real return bonds to compensate an investor for the risk of securitized commercial property as an asset class. The following table shows the results of this analysis:

Commercial Property Securities Analysis as of 30Sep08

Country	Real Bond Yield	Plus Commercial Property Risk Premium	Less Dividend Yield on Commercial Property Securities	Equals Implied Rate of Future Real Dividend Growth
Australia	2.0%	2.5%	9.4%	-4.9%
Canada	2.3%	2.5%	6.2%	-1.5%
Eurozone	2.4%	2.5%	7.1%	-2.2%
Japan	1.8%	2.5%	2.8%	1.5%
Switzerland	1.1%	2.5%	1.0%	2.6%
United Kingdom	1.0%	2.5%	4.5%	-0.9%
United States	2.4%	2.5%	5.1%	-0.2%

If you think the implied real growth estimates in the last column are too high relative to your expectation for the future real growth in average rents, this implies commercial property securities are overvalued today. On the other hand, if you think the implied growth rate is too low, that implies undervaluation.

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. At any given point in time, the current price of a commodity futures contract should equal the expected future spot price for the commodity less some premium (i.e., expected return) the buyer of the future expects to receive for bearing the risk that this forecasted future spot price will be inaccurate. Over time, real commodity prices have generally been hard to predict over time horizons relevant to futures investors (though over longer periods, they have tended to decline). However, the *actual* return realized by the buyer of a commodity futures contract can turn out to be quite different from the expected return. When this occurs, the difference will be due to unexpected changes in the spot price of the contract that occur after the date on which the futures contract was purchased but before it is closed out. If the unexpected change in the spot price is positive, the buyer of the futures contract (i.e., the investor) will receive a higher than expected return; if the unexpected price change is negative, the buyer's return will be lower than expected. In a perfectly efficient market, these unexpected price changes should be unpredictable, and over time net out to zero. However, if the futures market is less than perfectly efficient – if, for example, investors' emotions first cause delayed adjustment to new conditions, and then cause prices to overshoot, then the value of the DJAIG index can diverge from its

rational equilibrium value. Our assumption is that the DJAIG's current level relative to its long-term average provides a rough indication as to whether it is under, over or fairly valued.

Between 1991 and 2005 period, the DJAIG had an average value of 107.6, with a standard deviation of 21.9. The **30 September 2008** closing value of 167.78 was 2.75 standard deviations above the long term average (assuming the value of the index is normally distributed around its historical average, a value greater than three standard deviations away from that average should occur less than 1% of the time). If history is any guide, mean reversion will eventually cause these prices to fall back toward their long-term average levels. Indeed this is beginning to happen. That said, it may also be the case that, because of changes in the world economy, the past behavior of this index may not be a good guide to the future. For example, we are still in uncharted territory today, whether due to speculation, a collective fear of high future inflation and/or a substantial decline in the value of the U.S. dollar versus many other currencies, and/or fundamental structural changes in supply and demand conditions in many commodity markets (e.g., the peak oil thesis, changing diets, and the increasing use of agricultural commodities for fuel as well as food, and/or a slow response of supply to increases in demand). For a much more extensive review of the different explanations for why commodity prices have been so high in recent months, see the April 2008 World Economic Outlook published by the International Monetary Fund. Until the underlying factors driving the DJAIG higher become clearer, and in light of weakening conditions in the real economy, we continue to believe that the probability of a near term decline in the spot price of the DJAIG still seems higher than the probability of a substantial further increase.

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. A number of factors contribute to the

expected future growth rate of timber REIT dividends. These are listed in the following table, along with the assumptions we make about their future values:

Growth Driver	Assumption
Biological growth of trees	This varies widely according to the type and maturity a given timber property (and, indeed, biological growth doesn't directly translate into returns as different trees and growing arrangements also involve different costs. We assume 6% as the long term average.
Harvesting rate	In order to produce a timber REIT's dividend, a certain physical volume of trees must be harvested each year. This will vary over time; for example, when prices are high, a smaller volume will have to be cut to pay for a given level of dividends. As a long term average, we assume that 5% of tree volume is harvested each year.
In-growth of trees	This refers to the fact that as trees grow taller and wider, they are capable of producing products with substantially higher values. This so called "grade change" will cause an increase in value (and hence return) of timber even when prices within each product category are falling. We assume this adds 3% per year to the return on timber assets.
Change in prices of timber and land on which the trees are growing	We assume that over the long term prices will just keep pace with inflation. In the U.S. some data shows real price increases of 2% per year over the past 20 years; however, IMF data shows real price declines on a world timber price index. Hence, we assume the contribution of real timber price changes to long term timber returns is zero. That said, given housing market problems around the world, in the short term we may see substantial declines in timber prices.
Diversification across countries	As in the case of commodities, that an investor in an internationally diversified

	portfolio of timber assets should earn a diversification return, similar to the one earned by investors in a well diversified portfolio of commodity futures contracts. In the interest of conservatism, we assume that in the case of timber this equals zero.
Carbon credits	In the future, investors in timberland may earn additional returns from the receipt and resale of carbon credits. However, since the future value of those credits is so uncertain, we have assumed no additional return from this source.

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 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, and investors should require a relatively low risk premium to own it.

Given these assumptions, our assessment of the valuation of the timber asset class at **30 September 2008** is as follows:

Average Dividend Yield	4.05%
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 Ingrowth	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	<u>8.05%</u>
Real Bond Yield	2.43%

Plus Risk Premium for Timber	4.00%
Equals Average Annual Real Return Demanded	<u>6.43%</u>
Ratio of Returns Demanded/Returns Supplied Equals Valuation Ratio (less than 100% implies undervaluation)	<u>80%</u>

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, 2005, the average value of the VIX Index was 19.45, with a standard deviation of 6.40. The one standard deviation (67% confidence interval) range was 13.05 to 28.85, and the two standard deviations (95% confidence) range was from 6.65 to 32.25. On **30 September 2008**, the VIX closed at 39.39, more than three standard deviations above its historical average. This seems in line with the high degree of uncertainty that currently exists in financial markets and the world economy; as a result, it is hard to say whether it is under or overvalued.

Sector and Style Rotation Watch

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

Current economic conditions affect the current cash flow an asset produces. Future economic conditions affect future cash flows and discount rates. Because they are more numerous, expected future cash flows have a much bigger impact on the fundamental value of an asset than do current cash flows. Hence, if an investor is attempting to earn a positive return by purchasing today an asset whose value (and price) will increase in the future, he or she needs to accurately forecast the future value of that asset. To do this, he or she needs to

forecast future economic conditions, and their impact on future cash flows and the future discount rate. Moreover, an investor also needs to do this before the majority of other investors reach the same conclusion about the asset's fair value, and through their buying and selling cause its price to adjust to that level (and eliminate the potential excess return).

We publish this table to make an important point: there is nothing unique about the various rotation strategies we describe, which are widely known by many investors. Rather, whatever active management returns (also known as "alpha") they are able to generate is directly related to how accurately (and consistently) one can forecast the turning points in the economic cycle. Regularly getting this right is beyond the skills of most investors. In other words, most of us are better off just getting our asset allocations right, and implementing them via index funds 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 more on this, see "Sector Rotation Over Business Cycles" by Stangl, Jacobsen, and Visaltanachoti and "Can Exchange Traded Funds Be Used to Exploit Industry Momentum?" by Swinkels and Tjong-A-Tjoe).

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. 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 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

<i>Rolling 3 Month Returns Through</i>	30Sep08			
<i>Economy</i>	Bottoming	Strengthening	Peaking	Weakening
<i>Interest Rates</i>	Falling	Bottom	Rising	Peak
<i>Style and Size Rotation</i>	Small Growth (DSG) -11.19%	Small Value (DSV) -0.34%	Large Value (ELV) -5.59%	Large Growth (ELG) -12.30%
<i>Sector Rotation</i>	Cyclicals (IYC) -2.80% Technology (IYW) -12.39%	Basic Materials (IYM) -32.10% Industrials (IYJ) -10.53%	Energy (IYE) -25.39% Staples (IYK) 4.43%	Utilities (IDU) -19.83% Financials (IYF) 3.11%
<i>Bond Market Rotation</i>	Higher Risk (HYG) -10.27%	Short Maturity (SHY) 1.68%	Low Risk (TIP) -3.78%	Long Maturity (TLT) 3.84%

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 **September 2008**. The distinction between possible, likely and probable reflects a rising degree of confidence in our conclusion.

Probably Overvalued	Canadian, Japan, U.S. and India Equity
Likely Overvalued	Commodities; U.S. and Japanese Government Bonds
Possibly Overvalued	Canadian and Eurozone Government Bonds; Commercial Property (except Australia),
Possibly Undervalued	Timber, Australia Gov't Bonds, Property and Equity, Eurozone and Swiss Equity
Likely Undervalued	U.K. Equity; Real Return Bonds in the U.S., Japan and Canada
Probably Undervalued	

Economic and Asset Allocation Update

October is usually the month when we review the latest “Global Financial Stability Report” and “World Economic Outlook” published by the International Monetary Fund, and compare them to our own scenarios. This year, however, events have evolved so rapidly that these publications are already a bit out of date. For that reason, our summary of their contents will be brief. The GFSR notes that “confidence in global financial institutions and markets has been badly shaken”, due to the “continuing decline in the U.S. housing market and wider economic slowdown [that] is contributing to new loan deterioration – delinquencies on prime mortgages and commercial real estate as well as corporate and consumer loans are increasing. With default rates yet to peak and the recent heightened market distress, declared losses on U.S. loans and securitized assets are likely to increase further to about \$1.4 trillion, significantly higher than previous estimates.” The resulting “deleveraging in the banking sector will take place along multiple dimensions, requiring asset sales, slower new asset growth, and radical changes to banks’ business models as many previous sources of revenue have nearly disappeared...A similar deleveraging process is underway for many non-banks, such as hedge funds, where the ability to use margin financing and private repurchase markets to take leveraged positions has been severely curtailed.” The October GFSR concludes that “internationally coherent and decisive policy measures will be required to restore confidence in the global financial system. Failure to do so could usher in a period in which the ongoing deleveraging process becomes increasingly disorderly and costly for the real economy.”

The October WEO is equally bleak in its forecast. “After years of strong growth, the world economy is decelerating quickly. Global activity is being buffeted by an extraordinary financial shock and by still high energy and other commodity prices...In hindsight, lax

macroeconomic and regulatory policies may have allowed the global economy to exceed its ‘speed limit’ and may have contributed to a buildup of imbalances across financial, housing, and commodity markets. At the same time, market flaws, together with policy shortcomings, have prevented equilibrating mechanisms from operating effectively and allowed market stresses to build.” Looking forward, the IMF’s baseline forecast still projects positive, if much reduced real growth at the global level, driven by continuing growth in China and other emerging markets and stronger fiscal stimulus by developed country governments. However, it also stresses that “there are substantial downside risks to this baseline forecast. The principal risk revolves around two related financial concerns: that financial stress could remain very high and that credit constraints from deleveraging that could be deeper and more protracted than envisaged in the baseline. In addition, the U.S. housing market deterioration could be deeper and more prolonged than forecast, while European housing markets could weaken more broadly. Inflation risks to growth are no more balanced because commodity prices have retreated as the global economy slows. At the same time, potential disruptions to capital flows and the risks of rising protectionism represent additional risks to the recovery.”

For better or worse, recent developments are consistent with the scenarios we have been using for the past few years, the most likely of which was the significant and somewhat chaotic downturn we are now experiencing, now that U.S. consumers have hit the point of maximum leverage and begun to reverse their spending and borrowing. In our view, the key question has been how events would evolve once we had reached this point. In the past, we have described two alternate paths (or “attractors”, in the language of complex adaptive systems theory): one characterized by a high degree of cooperation and the other by a high degree of conflict. We have further described our belief that the path the world ends up following will depend on the actions of three key groups: the American middle class, Chinese peasants, and Iranian youth. Let us look at each of these.

In our view, the conclusion that the American consumer’s debt financed spending binge would one come to a painful end has never been in doubt. Trends that can’t go on forever simply don’t. The critical uncertainty has been how the hangover would be treated. The conflict scenario would involve a sudden stop in spending, a substantial rise in unemployment, aggressive defaulting on all forms of debt (enabled, perhaps, by liberalization of America’s bankruptcy laws), and perhaps a rise in protectionism and restraints on global capital flows.

This would cause a collapse in the value of many financial assets and set off a classic debt deflation cycle that would ultimately be stopped by a sharp increase in government transfer payments (financed, in part, by higher income taxes on “the rich”), money supply growth and much higher U.S. inflation. The cooperative scenario would involve significant government policy changes to address key sources of middle class insecurity and uncertainty (e.g., a national health care plan, a college loan program with repayments tied to lifetime income, perhaps Australian style mandatory defined contribution pension plans, a shift to progressive taxation of consumption, etc.), widespread debt reductions and loan modifications to minimize defaults, and increased government spending on widely supported priorities (e.g., infrastructure renewal, cleantech, etc.).

In China, the conflict scenario involves a sharp fall in export revenues that is not offset by a rise in domestic demand (whether from higher private or government consumption). This triggers not only rising unemployment in urban areas, but also sharp falls in the equity and property markets. It might also trigger sharp price reductions by Chinese exporters, which would only reinforce the debt deflation already underway in the United States and possibly other developed countries. At this point, the actions of Chinese peasants become crucial. Already frustrated by a widening income gap compared to urban workers and high levels of corruption by local officials, they could join with angry unemployed urban workers and set off a debilitating wave of social and political unrest that would trigger a sharp contraction in the Chinese economy. This scenario might also lead to rising tensions with Taiwan, as the Chinese Communist Party attempts to stoke nationalist feelings to retain its hold on power. In contrast, the cooperative scenario in China involves higher government spending on health care and social security, which would allow for reduced savings and higher private consumption spending. It would also involve steps (e.g., a rise in agricultural prices and/or land reform) to raise rural incomes, which would further expand domestic spending, and help maintain both manufacturing employment and social stability. On the international front, this cooperative scenario would likely lead to a stronger leadership role for China.

In Iran, the conflict scenario involves falling oil prices and reduced government revenues, which limits the Ahmadinejad government’s ability to maintain social peace through high government spending and/or leads to more money creation and even higher inflation (which in June 2008 had reached an annualized rate of 26%). This would likely lead to even

more aggressive moves by Ahmadinejad on the international front (e.g., Iraq, the Arabian peninsula, support of Hezbollah and/or development of the country's nuclear program), again with the goal of using nationalism to retain power and also to force a sharp increase in oil prices. In the cooperative scenario, the nation's large population of youth (the country's median age is only 26), in alliance with its still large middle class, forces a change in Iran's government, and a moderation of its policies. In turn, this leads to the lifting of economic sanctions on Iran, and more rapid growth in its economy, and the return of many Iranians from abroad, both of which further reinforce the country's stability.

Having described the different paths along which key uncertainties could evolve, let us now turn to what the current evidence indicates about which path we are currently on. In the United States, we have seen a sharp drop in consumer confidence and spending, and rising unemployment and loan delinquencies along with aggressive government action to maintain liquidity and capital adequacy in the financial system and forestall a deflationary debt collapse. What we have yet to see is an equally aggressive attempt to deal with the root cause of the problem: the overleveraged American consumer. We have lived through enough credit crises to conclude that "growing your way out of debt" doesn't work. Once they reach a critical mass, the resolution of credit crises requires reducing the economic burden of underlying debt, whether through bankruptcy, debt/equity swaps, renegotiation or inflation. Until we see that happening in the United States, consumer spending will continue to fall, and (barring a dramatic increase in domestic consumption in China) will probably pull the world economy down with it.

On the other hand, current polls indicate that Barack Obama will likely be elected President of the United States in November. More so than John McCain, Obama seems likely to pursue at least some of the initiatives that characterize our cooperative scenario. He is also likely to benefit from a very substantial increase in the global goodwill needed to support cooperative solutions the problems now facing the world. That said, Obama's election might also have the opposite effect. For example, unions are strong supporters of the Democratic Party, and they support a highly protectionist agenda. Obama has also drawn heavy support from the teachers unions, who may seek a rollback of education reforms enacted in recent years. Polls indicate this would be very unpopular with many voters. Similarly, with over forty percent of Americans currently paying no income tax, and five percent paying nearly

sixty percent of the total, any attempt to sharply raise marginal tax rates in the U.S., particularly in the depths of a recession and at a time when the market for many of these people's skills is truly global, runs the risk of triggering counterproductive consequences. Finally, as happened in the case of John Kennedy and Nikita Krushchev, some foreign leaders (e.g., Ahmadinejad) may judge Obama to be weak, and therefore decide to act in a more aggressive manner. In sum, while the election of a President Obama would seem to point towards the cooperative scenario, there are still a lot of ways the conflict scenario could come to pass.

The news has also been mixed in China. On the negative side, export revenues are down, unemployment is up, there has been no sign of higher government spending on health care or pensions, equity and property markets have been declining, while support for the government is further undermined by high levels of corruption and a series of scandals (the latest being milk contaminated with melamine) that reflect badly on its competence. On the positive side, the Central Committee of the Chinese Communist Party has recently indicated that rural land reforms are on the way (though the details – and hence, impact – remain unclear). On balance, given the evidence available today, we conclude that the conflict scenario seems more likely in China than the cooperative one.

In Iran the picture is also mixed. On the one hand, following the successful surge strategy in Iraq, Iran has lost leverage there, while a recent attempt to impose a value added tax met with widespread resistance by businesses, and led to a backdown by the Ahmadinejad government at a time when falling oil prices are reducing government revenues. On the other hand, it looks like China and Russia are moving to weaken that embargo, and, if Israel believes that an Obama administration would not approve a strike on Iran's nuclear facilities, it now faces a short window of opportunity to carry out such an attack. If this were to occur, Iran has promised to close the Straits of Hormuz, which would be certain to trigger an armed confrontation with the United States and other nations (two thirds of the oil passing through the strait is destined for Asia). That said, a short, sharp conflict in which Iran not only suffered economic damage but also found itself even more isolated might also prove to be a catalyst for more action on the part of Iranian youth. On balance, the prospects for Iran following the cooperative scenario look better than they have in quite some time.

We must also acknowledge the appearance in recent months of a new force that supports the development of our conflict scenario: a newly aggressive Russia. In the medium

term, Russia continues to face difficult challenges, including declining oil production from current fields, the high cost of developing new fields in remote areas, declining attraction to foreign investors, and a rapidly falling population. In the short term, however, Vladimir Putin has decided to embark on an aggressive effort to reestablish a traditional Russian sphere of influence, perhaps try to extent it to continental Europe, and challenge the United States in other areas, such as South America.

Last but not least, in past economic analyses we have also recognized the potential importance of two so-called “wildcards”, which could have a large impact on the economy and financial markets, but whose timing is impossible to predict. The first is the evolution of the H5N1 influenza virus into a form that is as communicable and deadly as the Spanish Flu was in 1918. While H5N1 has disappeared from the popular press, it continues to evolve in a worrisome direction. The bad news is that many strains of H5N1 have acquired a genetic change that makes the virus resistant to treatment with Tamiflu, a popular antiviral drug. In addition, it appears that H5N1 has become endemic in Indonesia and Egypt, where it continues to mix with other influenza subtypes, which hastens the pace of its evolution. The good news is that to date evidence of substantial increases in H5N1’s communicability have not been observed. The second wildcard scenario is a natural environmental disaster that causes substantial environmental damage whose severity can plausibly be linked to global warming. This would no doubt trigger a sharp increase in popular demand for tougher carbon regulations and more spending on environmental technology, even at the cost of reduced economic growth. On the other hand, this probably would also lead to the rapid development of carbon emissions allowances as a new asset class.

Looking at the uncertain economic situation we face today, it is hard to say whether our cooperative or our conflict scenario appears more likely to develop, as there are forces pushing the global system in both directions. If we had to make a call, we would go with the conflict scenario, principally because of our doubts about China’s ability to manage the transition from an economy driven by exports to one driven by domestic demand. We are also less than sanguine about the ability, and perhaps the willingness, of a President Obama to resist the legislative priorities of some of the more radical (and conflict stimulating) elements in his party, who seem likely to control the U.S. Congress for the next two years.

What then, are the implications of these views for asset class valuations and allocation? Our conclusions regarding asset class valuations as of 30 September are summarized in this month's Asset Class Valuation Update section. Our final table from that section is reproduced below:

Probably Overvalued	Canadian, Japan, U.S. and India Equity
Likely Overvalued	Commodities, U.S. and Japanese Government Bonds
Possibly Overvalued	Canadian and Eurozone Government Bonds; Commercial Property (except Australia),
Possibly Undervalued	Timber, Australia Gov't Bonds, Property and Equity, Eurozone and Swiss Equity
Likely Undervalued	U.K. Equity; Real Return Bonds in the U.S., Japan and Canada
Probably Undervalued	

We continue to stress that our valuation conclusions say nothing about when the overvaluations and undervaluations we have identified will reverse. Both bubbles and busts are usually characterized by protracted overreactions, and the timing of their reversals seem uniquely resistant to accurate forecasting.

It is also interesting to look at how different asset classes have performed in recent months, as portfolios have been hit with the equivalent of a Category 5 hurricane. From a global perspective, one of the most important developments in the past month has been a sharp increase in the value of the U.S. dollar, against most other currencies (the Yen and Swiss Franc being exceptions), as shown in the following table:

Year to Date Change in USD versus Other Currencies at 30Sep08

AUD	CAD	EUR	JPY	GBP	CHF	INR
10.16%	7.17%	3.93%	-5.23%	10.45%	-0.97%	16.08%

In our view, these returns reflect a traditional, emotionally-driven response to a sudden, sharp increase in uncertainty – a desire for liquidity. What is more interesting is that, despite the overall size of the Euro denominated fixed income markets (which are about on par with the USD), investors' instrument of choice when demand for cash/liquidity spikes remains short

term U.S. Treasury bills. That said, domestic bond markets have performed well in all currencies, as a result of the flight to liquidity.

The collapse of the credit bubble has also resulted in a wide range of returns across different sectors of the nominal return fixed income market. This can be seen in the following table:

Sector	Instrument (ETF)	YTD Return at 17Oct08
Intermediate Duration Treasuries Index	IEI	4.59%
Intermediate Duration Investment Grade Corporate Credit Index	CIU	(10.46%)
High Yield Credit Index	HYG	(24.79%)
Treasuries plus Investment Grade Credit Index	GVI	(2.90%)
Aggregate Bond Market Index (includes Treasury, Investment Grade Credit, and Investment Grade Asset Backed Securities)	AGG	(5.51%)
Incremental Return from Investment Grade Credit Risk (GVI-IEI)		(7.49%)
Incremental Return from High Yield Credit Risk (HYG-CIU)		(14.33%)
Incremental Return from Asset Backed Securities (AGG-GVI)		(2.61%)

Developments in the real return bond sector have also been interesting. The good news is that across all currencies, returns have generally been positive through the end of September. However, in this month's Asset Class Valuation Update section, we note the surprising increase in real yields, at a time when you might logically expect them to fall as a consequence of the flight to quality (this would be especially true in the case of U.S. TIPS, which, because of their minimum payout, have attractive hedging properties under deflationary as well as inflationary conditions). Our conclusion is that this is a temporary phenomenon that is likely to be reversed as the sharp increase in demand for cash subsides.

Through the end of September, the performance of securitized commercial property has generally been, as one would expect, better than equities, though worse than bonds. However, local market/cultural factors also play a role. For example, in Australia, where a high percentage of property is securitized and where speculation regarding its future value may have been higher than elsewhere, its YTD performance was worse than equities. The opposite was the case in Switzerland, perhaps reflecting a belief among a segment of the world's investors that, when uncertainty spikes, it is time to put your money in Swiss property. Since the end of September, the performance of different property investments have also been quite volatile, reflecting, perhaps, investors' struggle to balance their portfolios between the short term threat of deflation and a longer term threat of inflation.

Following strong returns in recent years, commodity returns have turned negative – a subject we explore in more depth in this month's product and strategy notes. However, their negative return is still less than the negative returns on equities. In our view, this reflects a "time diversification" benefit of this asset class – while equity returns tend to lead economic conditions, commodity returns tend to either match or lag them over the business cycle. On the other hand, timber has been a real bright spot this year, delivering very strong YTD returns and providing diversification benefits when they have most been needed.

The performance of all sectors of the equity market – domestic, foreign developed markets, and emerging markets, has been strongly negative this year. This is exactly what you would expect – equities deliver their best returns when the threat of deflation and/or inflation is low.

The performance of the five uncorrelated alpha strategies we track (JAMNX, HSGFX, ANGLX, OGNAX, and DBV) has been very interesting. ANGLX is a global long/short fund, and at USD (30.23%) YTD through 30 September, its performance has been disappointing. However, HSGFX is also a long/short fund, and at USD 4.50%, its performance has been superb. Returns on our two explicitly equity market neutral funds – JAMNX (4.22%) and OGNAX (0.41%) have fallen short of the 1.67% YTD return on the Credit Suisse Tremont Equity Market Neutral Index (net of fees). However, they are among the best returns delivered by the relatively small number of equity market neutral funds that are available to retail investors, and are still well below the losses sustained by broad equity market indexes. Finally, with a YTD return (in USD) of (11.72%), our currency trading strategy, DBV, has delivered

disappointing returns so far this year. Last but not least, the VIX index, which tracks the future volatility of the U.S. equity market implied by index option prices, has delivered a year-to-date return of USD 75.07% through the end of September. The continuing shame of a lack of a retail product that invests in the VIX could not be more painfully clear.

Important as they are, year-to-date returns don't tell us the full story about the extent to which different asset classes and uncorrelated alpha strategies have provided investors with diversification benefits in the face of the extremely challenging financial conditions we have faced in recent months. For that reason, we will now look at a number of other analytical approaches to measuring these benefits.

Let's start with maximum monthly drawdown, since this is the outcome most likely to generate stomach problems and calls to advisers. The following table shows the five highest and five lowest maximum drawdowns between January 2007 and September 2008, expressed in U.S. dollars.

Five Lowest Drawdowns	Five Highest Drawdowns
Domestic Bonds (0.9%)	Emerging Market Equities (33.4%)
Real Return Bonds (0.9%)	EAFE Equities (29.0%)
HSGFX (1.5%)	ANGLX (23.0%)
OGNAX (2.1%)	Commodities (22.6%)
Foreign Currency Bonds (4.1%)	Volatility (21.4%)

A more traditional measure of the dependence between the returns on different asset classes is correlation. However, the standard approach to measuring correlation – the Pearson Product Moment Correlation Coefficient – assumes that the two return series being compared are both normally distributed (i.e., have the traditional “Bell Curve” shape). In general, asset class returns are close, but not quite normal – they are often a bit tilted and have fatter tails than the Bell Curve (technically, they often have a slight negative skew and higher than normal kurtosis that makes both negative and more extreme returns more likely than in the normal case). For that reason, in our analysis we have used a different measure of correlation, the Spearman Rank Correlation Coefficient. This measure does not assume that distributions are normally shaped, and is less affected by outlying returns. Again, we looked at monthly U.S. dollar denominated returns between January 2007 and September 2008. Here are the highlights from our analysis:

- Returns on real return bonds, domestic bonds (as measured by the Lehman Aggregate Index), and foreign currency bonds were all highly correlated with each other (coefficients of .84 or greater). They also had a relatively high correlation with volatility (real bonds, .51, domestic bonds, .73, foreign bonds, .52).
- Domestic and foreign commercial property had virtually no correlation with each other; domestic commercial property had a negative correlation with real return bonds (-.32) and domestic bonds (-.37). Foreign commercial property had negative, but much lower correlations with these asset classes, and with foreign currency bonds (-.17). Domestic commercial property had negative correlations with all three equity asset classes, while foreign commercial property had strong correlations with them (.59 or more).
- Commodities had a strong negative correlation with domestic commercial property (-.71), but strong positive correlations with EAFE and Emerging Equities (.74 and .60, respectively).
- Returns on timber had a very low correlation with those on most other asset classes. Foreign currency bonds was the highest at only .40.
- Returns on all three equity asset classes have had correlations of .74 or more.
- The returns on volatility had the strongest positive correlation with fixed income, and the highest negative correlation with domestic property (-.52), with foreign property trailing a bit further behind (-.32).
- Of the five allegedly uncorrelated alpha strategies we track, three have had quite high correlations with returns on the equity asset classes: JAMNX, ANGLX, and DBV (which is odd, since the latter is a currency strategy; this implies strong exposure to a common factor). On the other hand, two other strategies have had quite low correlations with other asset classes. The highest correlation for HSGFX was with volatility (.49), while OGNAX has strong negative correlations with fixed income asset classes (real return bonds, -.65; domestic bonds, -.71, and foreign bonds, -.64) as well as timber (-.49) and volatility (-.52).
- Based on this analysis, it appears that maximum diversification benefits (as measured by correlation) would have been provided by a mix of fixed income (some combination of real return, domestic and foreign currency bonds), domestic commercial property, commodities, timber, volatility, a mix of equity indices (including domestic, foreign

developed and emerging), along with two uncorrelated alpha strategies: HSGFX and OGNAX.

Our final analysis of the diversification issue is based on principal components analysis (PCA). The essence of this approach is the use of statistical techniques to extract the underlying drivers from a large set of returns data, and to identify how different asset classes' returns are affected by these drivers. The following table is based on U.S. dollar total returns between January 2007 and September 2008. The first row shows how much of the total variability of the returns data is explained by each underlying driver (technically, they are called "vectors"). As you can see, just four underlying drivers can explain 90% of the variability of the returns data during the period we examine. The art in principal components analysis is trying to explain just what these drivers might correspond to in the real world. We won't attempt that in this article, and will instead focus on what our PCA tells us about the main sources of diversification benefits for investors over the last twenty one months. The remainder of the table shows the strength of the relationship between returns on different asset classes and changes in the four return generating factors. We have highlighted the strongest relationships.

Principal Components Analysis
USD TR from Jan07 to Sep08

	Vector 1	Vector 2	Vector 3	Vector 4
<i>Pct of Variance Explained by Vector</i>	44%	25%	12%	9%
<i>Asset Class Vector Weightings:</i>				
Real Return Bonds	0.05	0.40	0.04	(0.39)
Domestic Bonds (Lehman Agg)	0.06	0.47	0.01	(0.14)
Foreign Currency Bonds	0.13	0.39	(0.08)	(0.24)
Domestic Comm Prop	0.20	(0.28)	0.44	(0.06)
Foreign Comm Prop	(0.27)	0.04	(0.47)	(0.09)
Commodities	(0.28)	(0.02)	0.41	(0.16)
Timber	0.13	0.16	(0.46)	0.38
U.S. Equity	(0.33)	0.10	(0.30)	0.05
EAFE Equity	(0.37)	0.05	0.04	0.06
Emerging Equity	(0.35)	0.15	(0.08)	0.06
Volatility (VIX)	0.09	0.38	0.15	0.32

	Vector 1	Vector 2	Vector 3	Vector 4
<i>Uncorrelated Alpha Strategies Vector Weightings</i>				
JAMNX	(0.34)	0.10	0.08	0.06
HSGFX	0.03	0.16	0.19	0.68
ANGLX	(0.37)	(0.08)	(0.06)	(0.01)
OGNAX	(0.15)	(0.36)	0.14	0.05
DBV	(0.35)	0.12	(0.11)	0.08

Once again, we find that the three fixed income asset classes appear to have quite similar exposure to our four underlying return drivers, with real return bonds having somewhat more in common with foreign bonds than with domestic bonds. This analysis also highlights the relative uniqueness of domestic commercial property, while finding that foreign commercial property looks rather similar to U.S. equity (which may have something to do with the fact that the index tracked by RWX, our commercial property ex-US ETF, gives around 60% weight to just three countries: Australia, Japan and the U.K.). On the other hand, commodities, timber and volatility all provide unique mixes of exposure to the four return drivers. Within equities, EAFE and emerging markets appear quite similar over the period examined, with U.S. equities only slightly behind. This confirms the similar finding from the correlation analysis. The same is true in the case of our uncorrelated alpha strategies. HSGFX and OGNAX are once again shown to be relatively unique (and hence a source of potential diversification benefits), while JAMNX, ANGLX and DBV are shown to have similar profiles to broad asset classes in which a passive investment may be made at much lower cost than an investment in these actively managed funds.

Viewed somewhat differently, over the past twenty one months, a portfolio that was long real return bonds, domestic bonds, domestic and foreign property, commodities, timber, and a very broad equity fund (i.e., one including domestic, foreign and emerging markets), possibly complemented with two uncorrelated alpha strategies (HSGFX and OGNAX) would have both maximized an investor's positive and negative exposures to the four major factors that have driven financial market returns between January 2007 and September 2008.

Overall, we have a number of takeaways from our analysis of diversification effectiveness over the past 21 tumultuous months. Our starting point is our core belief that an investor's portfolio should include a mix of asset classes that provide positive payoffs in each

of three possible economic states: deflation, high inflation, and normal times. Our assumption has been that domestic and foreign nominal return bonds, and to a lesser extent domestic and foreign property would provide a hedge against deflation (as well as U.S. TIPS, because of their minimum real return feature). In the case of high inflation, hedges would be provided by real return bonds, commodities, timber, domestic and foreign property and foreign currency bonds (the latter on the assumption that high inflation would often result in exchange rate depreciation). In normal times, equities would provide high positive returns. And across all three states, actively managed strategies whose returns had no or low correlation with the returns on our major asset classes would further enhance a portfolio's risk/return characteristics, as would an allocation to volatility if retail products in the latter area ever become available.

Recent events have caused us to adjust this model in a number of areas. Within domestic bonds, it is clear that intermediate term government bonds, and not a broad fixed income market index, provides the best hedge against not only deflation, but also (along with volatility) against a large uncertainty shock. While U.S. property has reacted as expected, foreign property, at least as it is currently tracked by broad indexes, has delivered a worse performance than we had expected. Specifically, as the crisis has unfolded, while some markets (such as Switzerland) have seen investors increasing their allocations to property as a defensive move, others (e.g., Australia, where much more property is securitized) have seen property shares collapse along with the rest of the equity market. Clearly, the role of foreign property in a portfolio is an issue that required further analysis. Looking at commodities, the past two years have made it clear that, given tighter supply/demand balances in a range of products, this is an asset class that, along with equities, can deliver strong positive returns during normal states when growth is strong and inflation is low. We have also been pleasantly surprised to see timber delivering strong returns during the most recent liquidity and credit shock. Perhaps this is because more investors have recognized that timber increases in value – thanks to trees' physical growth – regardless of what is happening in the world, and with a minimal need for capital. On the equity front, the relatively lockstep performance of all developed world equity markets in recent months will once again lead us to examine whether we should treat this as a single asset class. On the other hand, we continue to believe that both qualitative (i.e., differences in institutions and governance) and quantitative factors argue for treating emerging

equities as a separate asset class. Finally, while the theoretical basis of uncorrelated alpha strategies is clear, in practice, minimizing correlation with other asset classes is quite challenging. That said, we were pleased to see that two of the strategies we use in our portfolios (OGNAX and HSGFX) met this test.

We are taking all of these “lessons learned” into consideration as we proceed with our internal review of our model portfolios, the results of which we will publish when they are completed. Beyond asset class specific considerations, the way different asset classes have behaved during the recent crisis – which has often sharply contrasted with historical relationships during more normal periods -- has convinced us that future asset allocation methodologies must explicitly incorporate regime switching – a direction in which we had already been moving in our own modeling. .

Last but not least, we will end with a comment on the performance of our model portfolios in the face of the extremely challenging conditions in global financial markets. First, recent performance has only reinforced our view that, once an investor moves beyond a long-term target real return of four or five percent, risk increases non-linearly. Second, we are gratified to see that most of our portfolios – across all eight currencies – have avoided the worst of the losses that have occurred over the past nine months. To put that return performance into better perspective, we prepared the following table, which shows the year-to-date local currency denominated nominal returns (through the end of September) of six portfolios: (1) our 5% target real return; (2) our 4% target real return; (3) our equally weighted, “zero forecasting risk” portfolio (which does not include an allocation to uncorrelated alpha strategies or volatility); (4) a portfolio allocated 40% to domestic bonds and 60% to domestic equity; (5) a 50% domestic bonds, 50% domestic equity portfolio; and (6) a 60% domestic bonds, 40% domestic equity portfolio. Note that this is a simple analysis, as it does not include historical or expected volatility and other risk measures for any of the portfolios (i.e., equally weighted across more asset classes lowers volatility compared to a 50/50 domestic bond/equity split). On the other hand, this approach is probably an accurate reflection of the way many people look at the world.

YTD Local Currency Returns Through September 2008

	5% TGT YTD	4% TGT YTD	EQ WTD	40DB/60 DE	50DB/50 DE	60DB/40 DE
AUD	-4.8%	-3.3%	-5.1%	-7.4%	-4.7%	-1.9%
CAD	-4.8%	-3.9%	-6.2%	-7.2%	-5.7%	-4.2%
EUR	-10.6%	-6.1%	-9.8%	-16.6%	-13.4%	-10.2%
JPY	-22.1%	-15.5%	-17.3%	-14.9%	-12.4%	-9.8%
GBP	-4.1%	-1.5%	-3.3%	-11.8%	-9.7%	-7.5%
USD	-10.4%	-6.7%	-11.0%	-10.9%	-9.0%	-7.0%
CHF	-14.1%	-11.1%	-10.5%	-10.7%	-8.4%	-6.1%
INR	-9.7%	-4.4%	-3.3%	-23.6%	-20.3%	-17.0%

It is also useful to look at the performance of another portfolio that we have been experimenting with internally, in response to the number of requests we have received for an asset allocation methodology that is easy to explain without resorting to “higher math.” The portfolio’s logic is based on the “state payoff” approach we described above. Markets can be in one of three states (deflation, inflation, or normal growth). Different asset classes have higher payoffs under these states. Based on recent experience, we assign intermediate term government bonds, domestic property and timber to the “deflation hedges” category; real return bonds, commodities and foreign currency bonds to the “inflation hedges” category; and developed market equities, emerging equities, and uncorrelated alpha strategies to the “normal growth” category. We realize that these assignments aren’t perfect (e.g., as we have seen, commodities can deliver attractive returns towards the end of a growth cycle), but as we said, the intent of this portfolio is to simplify. We give equal weights (i.e., 33%, 33%, and 34%) to the three asset classes within the deflation and inflation categories. The growth category is invested in the All Countries World Equity Index. Finally, we assign an unchanging 15% weight in the overall portfolio to uncorrelated alpha strategies. To obtain the portfolio weights for the other asset classes, we assign probability weights of 25% each to the deflation and inflation states, then multiply these state probabilities times the asset class weights within each category (e.g., 25% x 33%) to get a given asset class’s weight in the total portfolio. To obtain the weight of equities in the portfolio, we sum the weights of the other asset classes (including the 15% permanent allocation to uncorrelated alpha strategies), and subtract the result from 100%. (Clearly, one could use this portfolio construction methodology for actively managed tactical asset allocation based on changing state probability forecasts, but we’re not going there

now). When we multiplied the resulting asset class weights times U.S. dollar asset class returns through the end of September, we found a year-to-date portfolio return of (9.1%)

Going forward, our best estimate today is that the economic downturn into which we are headed will be long and deep, and will proceed from a deflationary to an inflationary stage. Given this outlook, we are not of the school that simply says “sit tight and it will be okay.” We believe that advice runs too high a risk of turning frightened paralysis into a virtue. Hence, as we have been saying since May 2007, the first order of business for all investors is ensuring the adequacy of their liquidity reserves. Beyond that, we are strong believers in the proposition that investors can improve their risk/return tradeoff over time by following a disciplined approach to rebalancing that involves (1) automatically considering adjustments to asset class weights when a trigger based on a maximum allowable divergence of an actual weight from a target weight (e.g., 2.5% or 5%) is exceeded; and (2) taking current asset class valuations into account, with a specific objective of reducing exposure to substantially overvalued asset classes. In other words, we believe in reducing asset class exposures when either they exceed target and the risk of large losses) becomes substantial. To repeat a point we cannot make too often: when it comes to achieving long-term financial goals, the avoidance of large losses is far more important than obtaining a few more basis points of return. On the other side, we believe in increasing asset class exposures when they fall short of target weights by a trigger amount, provided that the asset class in question does not appear to be substantially overvalued at the time. At a time like this, adherence to this approach is not easy. Yet we continue to believe it is the key to long-term investment success.

Product and Strategy Notes

Is the Financial Crisis a “Normal Accident”?

After assessing a wide range of possible analogies, we have decided that the current crisis in the global financial system is best described as the type of catastrophic failure predicted in a 1984 book by Charles Perrow (Normal Accidents: Living With High Risk Technologies). The author’s focus was not finance; rather, it was safety engineering, based on the lessons learned

from the Three Mile Island nuclear plant accident that occurred in 1979. However, his basic insights seem very applicable to the events of the past few months. Perrow began by dividing systems into four levels of aggregation. At the lowest level is the part – the smallest component of any system (a financial analogy might be a mortgage loan). One level up is a unit, which is composed of multiple parts (e.g., a mortgage backed security). The third highest level is a subsystem, which is a combination of units (e.g., a Collateralize Debt Obligation). Level four is the system itself (e.g., the global financial system), which includes a number of subsystems. In Perrow's terminology, an "incident" involves damage to parts or units; an "accident" involves damage to subsystems or to the system itself. Perrow then further categorized systems based on two dimensions. The first is the nature of their internal interactions. As Tom Czerwinski describes in his book ([Coping With the Bounds: Speculations on Nonlinearity in Military Affairs](#)), "linear interactions [characterize] highly structured systems which are logical, sequential and planned. They function as a series of expected events in a predictable sequence. If damage to a part occurs, the problem can be identified and corrected with little disturbance to the overall system. Linear interactions are also characterized by minimal feedback loops, which makes it easier to understand and monitor [system performance]. On the other hand, complex interactions are less predictable [due to a higher number of positive and negative feedback loops, operating over different time frames]. Breakdowns within one or more units and/or subsystems can occur because of unplanned and unforeseen interactions. Unexpected events may occur, regardless of intended systems design. Problems are not easily identified in complex systems, especially during the confusion and uncertainty that ensues from an accident."

Perrow terms the second criterion he uses to categorize systems "coupling." This refers to "the amount of slack, buffer, or give between two items in the system. Loosely coupled systems are characterized by decentralized operations, ambiguous performance standards and flexible control mechanisms....Processes do not flow in a rigid sequence...If something goes wrong, there is time to correct the problem without catastrophic consequences." In contrast, "tight coupling refers to agents or tasks that are highly dependent on one another. Disturbances in the system may be highly correlated to each other when the system is tightly coupled. Time-dependent processes, with little give or slack, characterize tightly coupled systems, and disturbances tend to quickly propagate through them."

Using these two dimensions – linear versus complex (non-linear) interactions, and loose versus tight coupling – Perrow places systems into four categories. In his view, the most dangerous are complex, tightly coupled systems, which Perrow concluded were most at risk of suffering catastrophic failures. The “Normal Accidents” perspective helps us to better understand (with hindsight, of course) the significance of a number of critical developments that took place in the financial services in recent years. In our view, the increasing globalization of markets as well as the use of common capital adequacy regulations and risk management methods (notably, value at risk modeling), and wider use of mark-to-market accounting combined to make financial markets into a much more tightly coupled system than they had been in the past. At the same time, the sharp increase in leverage and tenor mismatches, the explosive growth in outstanding derivative structures (like CDOs) and contracts (like credit default swaps), the rise in the total value of outstanding financial instruments relative to the capital base of the world’s financial intermediaries, and the advent of the internet and round-the-clock news media all increased the probability of non-linear interactions occurring (indeed, the fundamental purpose of leverage is to increase profits in a non-linear manner). Together, the net result was a movement of the global financial system into Perrow’s most dangerous “complex, tightly coupled” category.

Yet that is not to say that the catastrophic events of the past month were unavoidable. While it is true that complex, tightly coupled systems are more prone to severe problems (see, for example, “Evidence of an Interaction Involving Complexity and Coupling as Predicted by Normal Accident Theory” by Wolf and Sampson), some organizations seem able to operate them with a high degree of reliability. In their excellent book, Managing the Unexpected, Karl Weick and Kathleen Sutcliffe describe the practices found in what they term “high reliability organizations” (HROs) that are able to safely operate tightly coupled, non-linear systems like chemical plants and oil refineries. The authors conclude that “HROs manage the unexpected through five processes: (1) Preoccupation with failures rather than successes (they encourage the reporting of errors and learning from “near misses”, and are wary of the potential liabilities of success, including complacency and the temptation to reduce margins of safety). (2) Reluctance to simplify (knowing the system they face is complex, unstable, and unpredictable, they encourage skepticism toward received wisdom, and value diversity, which helps them to see more). (3) Sensitivity to operations (they stress spotting anomalies and learning from them,

and maintaining high and shared awareness of how the system is operating). (4) Commitment to resilience (they develop capabilities – such as frequent training to respond to different failure modes -- to detect, contain and bounce back from errors that are inevitable in tightly coupled, complex systems). And (5) they adopt flexible decision making, with more decisions being made at the front line in times of crisis (and a strong sense of organizational mission as well as common training and situational awareness ensuring that those decisions will be made in a consistent and mutually reinforcing manner)...Together, these five processes produce a collective state of ‘mindfulness’ – a rich state of awareness and an enhanced ability to discover and correct errors that could escalate into a crisis.”

The question that must be asked (admittedly with the benefit of hindsight) is the extent to which financial services firms – and their regulators – were following these five maxims, given the tightly coupled, non-linear system they operated. The steady stream of financial crises over the past twenty six years suggests they were not. And speaking personally, as one who has both worked in the financial services industry around the world, and later run an HRO in the petrochemical industry, I cannot help but agree. The entire performance bonus culture of the financial services industry places the focus on success rather than failure; you are constantly reminded that “simple stories sell” while complicated ones put clients to sleep; with few exceptions, the bonus system encourages focus on the performance of your unit or subsystem, and not shared awareness of the system as a whole; the focus is on winning deals and trades, not how the system could go badly wrong – indeed, as any investment bank’s risk manager can tell you, bringing up the latter to vociferously involves heavy “career risk”; and while decision making is often decentralized, with few exceptions (Goldman Sachs being one) it is not guided by a larger sense of organizational mission and culture.

Perhaps this is simply the logical result of investment banks changing from partnerships to limited liability companies, the “too big to fail” doctrine that took root at the time of the 1982 LDC debt crisis, a sharp increase in the availability of savings and liquidity, our society’s increasingly focused on conspicuous consumption, and the financial services industry’s growing ignorance of or disregard for history. Whatever the causes, and they are no doubt many, I have no doubt that there was a world of difference between the way the chemical and financial services industries operated in recent years.

Going forward, Perrow's Normal Accident approach points towards the regulatory changes that can be made to make the financial system more safe and reliable in the future. These include reducing the system's tight coupling (e.g., by using a wider variety of risk management models and raising capital adequacy requirements), reducing its non-linearity (e.g., by capping maximum leverage, forcing credit default swaps onto an exchange, and perhaps greater use of electronic crossing networks to increase liquidity in fixed income markets), and mandating more HRO-type organizational practices.

Interesting New Products and Studies

As we have repeatedly noted, the addition of uncorrelated alpha strategy funds (i.e., funds whose returns have a low or zero correlation with returns on broad asset class index funds) can bring significant risk/return benefits to a portfolio. In practice, however, investors wishing to realize these benefits face three hurdles.

First, too many people confuse "uncorrelated alpha strategies" with "hedge funds." The latter term has become so broad that it has effectively lost any clear meaning, with the possible exception of reference to a way of compensating (or overcompensating) investment managers, who, by labeling their product a "hedge fund", get to charge investors 2% of the assets under management plus 20% of the profits above some minimum return. A long time ago, in a galaxy far, far away, "hedge funds" took long positions in specific assets, and short positions in a market index. The goal was to earn positive returns for taking company specific risk, without regard to the overall market's performance (i.e., without regard to systematic returns, or beta). Because their goal was to consistently deliver positive returns, these funds also became known as "absolute return" strategies. Now fast forward to September 2008, and the list of "hedge fund" returns reported by Credit Suisse/Tremont (the industry's best source of information, in our view, because they weight index performance by assets under management). Through the end of September, the overall Hedge Fund Index had delivered a year to date return of (9.87%) in U.S. Dollars, net of fees. In turn, the index is composed of ten sub-strategies, including convertible arbitrage, dedicated short bias, event driven, emerging markets, fixed income arbitrage, managed futures, long/short equity (essentially this is equity market neutral without fully offsetting the market exposure), global macro, equity market neutral and multistrategy.

Year-to-date returns on these sectors range from a low of (19.45%) for convertible arbitrage and (18.07%) for emerging markets, to a high of 6.70% for managed futures, 3.40% for dedicated short bias, and 1.67% for equity market neutral. As we have described in the past, most of these strategies have a significant correlation of returns with one or more broad asset classes that we already include in our model portfolios. That is why we have consistently focused on equity market neutral funds as a source of the holy grail of uncorrelated alpha, and global macro type products (e.g., PIMCO's PASAX) for those who wish to outsource episodic rebalancing to take advantage of significantly over and undervalued asset classes. Despite this, hope of tapping retail investors' fascination with "hedge fund" products seems to spring eternal in the heart of fund company marketers.

The second problem is one we have reviewed at length elsewhere in this month's issue – changing market conditions can result in a higher than expected correlation between a fund's return and the return on broad asset class index funds. The third problem is one that faces all active managers, and not just people running uncorrelated alpha funds. To put it bluntly, they can, and indeed most likely will, lose their mojo. We have written at length over the years about how difficult it is to remain a successful active manager for any length of time, in the face of the twin challenges of intense competition and successfully predicting the behavior of complex adaptive markets in which the underlying relationships between variables are constantly in flux. For this reason, we take a cautious approach to "hedge funds."

With that in mind, we call readers attention to three recent offerings. The IndexIQ Alpha Hedge Strategy Fund was launched in the U.S. in June. Its objective is to deliver not absolute returns, but rather returns that are relatively higher and less risky than those on the S&P 500 Index. It proposes to achieve this goal by going long and short ETFs to replicate the performance of six hedge fund strategies, including emerging markets (which has always struck us as nothing more or less than adding leverage and higher manager compensation to a traditional long-only emerging markets mutual fund), event driven, global macro, long/short equity, and equity market neutral. And all this for an annual expense charge of 1.64% of assets and a minimum investment of \$250,000 – but hey, there's no front end sales load! Makes Goldman's Absolute Return Tracker Fund (GARTX) seem like a bargain with its minimum initial investment of only \$1,000,

expenses of 1.6%, and a 5.25% front end load. Meanwhile, in France SocGen Asset Management has launched the TREX EFT, to complement a mutual fund of the same name launched in August 2007. It too promises to track a broad index of “hedge fund performance”, though it charges annual expenses of only .80% (eighty basis points) per year.

More interesting to us is a new series of funds that Putnam Investments has recently registered with the U.S. Securities and Exchange Commission. Called Absolute Return XXX Funds (with the XXX denoting 100, 300, 500, 700, and 1,000), these funds’ respective objectives are to outperform a three month U.S. Treasury Bill by 100, 300, 500, 700 and 1,000 basis points per year (i.e., by 1%, 3%, etc.). What caught our eye was how they intend to do this: “by combining two separate investment strategies: a beta strategy and an alpha strategy...The beta strategy consists of a globally diversified asset allocation strategy”, which will include allocations to U.S. and international equity, U.S. and international fixed income, currencies, commodities, real estate and inflation protected securities. The alpha strategies “consist of diverse active trading strategies designed to provide additional total return through the exploitation of market inefficiencies and other conditions...and are generally designed not to depend on market returns for success...The beta and alpha strategies are intended to be uncorrelated and to operate largely independently, thus improving a fund’s chances of earning a positive total return regardless of market conditions.” Putnam also intends to use leverage to help its funds to achieve their objectives – 50% of net assets for the 500 fund, 100% of net assets for the 700 fund and 200% of net assets for the 1,000 fund. The Class A shares will have a minimum investment of only \$500, and carry a 5.75% front end sales load. The annual expense charge had not yet been set – needless to say, we’ll be more than a little interested to see what it will be (we’re betting it will be more than we charge...)

The Supply of and Demand for Commodity Index Returns

As long-time readers know, 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 a financial fact of life. Over time, we have been extending this supply and demand of returns model to different asset classes to aid us in our assessment of their valuation. We express the demand for returns from an asset class as the current yield on real return government bonds (ideally of intermediate duration) plus an appropriate risk premium. While the former can be observed, the latter is usually the subject of disagreement. In determining the risk premium to use, we try to balance a variety of inputs, including historical realized premiums (which may differ considerably from those that were expected, due to unforeseen events), survey data and academic theory (e.g., assets that payoff in inflationary and deflationary states should command a lower risk premium than those whose payoffs are highest in “normal” periods of steady growth and modest changes in the price level). In the case of commodities, Gorton and Rouwenhorst (in their papers “Facts and Fantasies About Commodity Futures” and “A Note on Erb and Harvey”) have shown that (1) commodity index futures provide a good hedge against 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; and (3) the realized premium over real bond yields has 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.

On the supply side, the general form is the current income generated by the asset class in question (e.g., the dividend yield on equities), plus the rate at which it is expected to grow in the future. The key challenge with applying this framework to commodities has been 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 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 been in both states, However, contango has generally been more common, but not equally so for all commodities. For example, oil has spent relatively more time in backwardation, as have copper, sugar, soybean meal and lean hogs. This highlights a key point about commodity futures index funds – because of the critical impact of the commodities they include, the weights they give them, and their rebalancing and rolling strategies, they are, in effect, uncorrelated alpha strategies. Moreover, because of changing supply and demand conditions in many commodities (e.g., global demand has been growing, while marginal supplies are more expensive to develop and

generally have long lead times), it is not clear that historical tendencies toward backwardation or contango are a good guide to future conditions. To the extent that any generalizations can be made, higher real option values, and hence backwardation and positive roll returns are more likely to be found when demand is strong and supplies are tight, and/or when there is a rising probability of a supply disruption in a commodity where storage is difficult. Today, for example, with the global economy rapidly weakening, gold, aluminum, corn, soybeans, wheat, live hogs, live cattle, and natural gas (which, collectively make up about 57% of the DJAIG Commodities Index) are all in contango, while crude oil and copper (which make up a further 20%) are only slightly backwardated. Hence, in the near term, roll returns on this index 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 (e.g., due to a weather or security incident that disrupts supply). 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 (logically, the ability to forecast these changes beyond simple luck could result in active management profits). Again, large surprises seem more likely when supply and demand are finely balanced – the same conditions which can also give rise to changes in real option values and the roll return. A look at IMF commodity price data suggests that a tightening of the supply/demand balance is just what happened in recent years. The following table shows the correlation between real world GDP growth and price changes in three commodity sectors over two periods: 1981 to 1997 and 1998 to 2007. As you can see, in the second period, commodity price changes became much more strongly correlated with changes in GDP growth.

<i>Correlation with Real GDP Growth</i>	1981 to 1997	1998 to 2007
Crude Oil Prices	0.13	0.77
Agricultural Commodity Prices	0.27	0.50
Metals Prices	0.47	0.78

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. For a given commodity index product, the realized rebalancing return will depend not only on supply/demand conditions, but also the index's composition and rebalancing strategy.

So, to sum up, the expected supply of returns from a commodity index fund over a given period of time (say, one year) 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 in turn depend on the real option value/convenience yield of owning physicals instead of futures) and unexpected price changes (which are likely to be larger when supply/demand conditions are more closely balanced). Unfortunately, both of these return drivers are related to the expected rate of real global economic growth. When this slows down or turns negative, returns on commodity futures index funds in excess of the rate demanded become heavily dependent upon increases in the perceived risk of supply side disruptions, which increase the real option value of holding physicals, and thereby generate backwardation, positive roll returns, and more unexpected price changes. While these supply disruptions are very difficult to accurately forecast, their very randomness reduces the correlation of commodity futures index fund returns with returns on other asset classes, and hence creates the basis for the diversification benefits commodities provide to investors' portfolios.

Model Portfolios Update

Our model portfolios are constructed using a simulation optimization methodology. They assume that an investor understands the long-term compound real rate of return he or she needs to earn on his or her portfolio to achieve his or her long-term financial goals. We use SO to develop multi-period asset allocation solutions that are "robust". They are intended to maximize the probability of achieving an investor's compound annual return target under a

wide range of possible future asset class return scenarios. More information about the SO methodology is available on our website. Using this approach, we produce model portfolios for six different compound annual real return targets: 7%, 6%, 5%, 4%, 3%, and 2%. We produce two sets of these portfolios: one assumes only investments in broad asset class index funds. These are our “all beta” portfolios. The second set of model portfolios includes 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 2008, our U.S. cash benchmark is 3.97% (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/USA.php>