

The Index Investor

Invest Wisely...Get an Impartial Second Opinion.

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July 2009 Issue: Key Points

This month's economic update, and the H1N1 influenza update it includes, is not filled with good news. Too many of the world's bankers seem more intent on paying back government funds, restoring bonuses, and avoiding tighter regulations than on confronting the worsening problems in their balance sheets as unemployment rises and many segments of the credit market continue to deteriorate. Similarly, we have seen hardly any movement on the issue of mortgage relief for homeowners, so rising unemployment cannot help but bring more bad news in this area. There was, however, some good news over the past month. First, in the U.S. only 25% of the federal stimulus program money will likely be spent in 2009, with the bulk of it (50%) coming in 2010, and a further 25% in 2011. That should help maintain aggregate demand next year in the U.S., although the prospects elsewhere (particularly the Eurozone and Japan) seem more questionable. Second, and perhaps more important in the long-run, June also saw momentous events in Iran, that have fundamentally

changed the dynamic in a positive way in that country. That said, there remains the short term danger of an aggressive response by the Ahmadinejad Khamenei faction that would lead to greater domestic repression and a more aggressive international stance, at least for a while. However, the disintegration of the current regime's legitimacy seems well underway.

Our feature article this month analyzes the causes of the ongoing decline in returns from investment in venture capital limited partnerships. We conclude that the underlying problems are structural as well as cyclical, and that returns will likely remain depressed until many fundamental changes take place. Our product and strategy notes begin with a review of how to develop better foresight. We also provide more detail about the very important changes underway in Australia, the U.K., India and the U.S. with respect to the regulation of financial advisers and their compensation. We conclude that financial advisers in the Eurozone and Canada – who are open to the same criticisms – will likely find it increasingly hard to hold back similar changes in their markets. We also review a very strong criticism of leveraged and inverse ETF products that was recently released by the U.S. Financial Institutions Regulatory Authority, as well as other product news and interesting research findings.

This Month's Letters to the Editor

Given the credit risk inherent in an exchange traded note like LSC, have you considered switching to GCC (the Greenhaven Continuous Commodity Index ETF) to gain exposure to this asset class?

We take your point on the underlying credit risk exposure on all ETNs – in the case of LSC it is to HSBC Bank, the issuer of the note. However, given the evolution of commodity futures markets, and in particular, the increasing mismatch between buyers and sellers due to the inflow of investors into long-only commodity index funds, we very strongly believe in the advantages of products based on the S&P Commodity Trends Indicator Index, which systematically takes both long and short positions. As

we have noted in the past, there is currently a mutual fund (DXCTX, offered by Direxion) that tracks this index, though as we have noted it has a high minimum investment and is quite expensive. The good news is that Claymore has registered an ETF (not an ETN) that will also track this index, and with more reasonable expenses. We expect that once this product is launched, it will become our preferred vehicle for gaining exposure to commodities.

The principal virtue of GCC is that it tracks an equally weighted index of 17 commodities. As a result, it has relatively higher exposure to agricultural products, and relatively less to energy and metals, than the GSCI, which is heavily weighted towards oil and gas. As we have noted in the past, we agree with the general point that potential diversification benefits are maximized when a commodity index has relatively equal exposures to energy, metals, and agricultural products – that is why we historically preferred the Dow Jones AIG (now Dow Jones UBS) Commodity Index. By virtue of the commodities it includes, GCC actually gives a more than equal weight to agricultural products, and for that reason we have found it less attractive than products based on the DJUBS Index, or the S&P Commodity Trends Indicator Index.

What do you think of the VXX and VXZ ETFs that let retail investors get exposure to equity volatility as an asset class?

Let's say we're cautiously optimistic. On the one hand, we have long advocated for products that would allow retail investors to add equity volatility to their portfolios, as this has the potential to hedge away some of the tail risk that bit people so badly in 2008. On the other hand, as we have noted before, VXX and VXZ are relatively complicated products. They do not track the contemporaneous VIX index; rather they track futures contracts on what investors currently expect volatility to be over a near and medium term time horizon. This reminds us of Keynes' famous beauty contest analogy, where the goal is not to pick the prettiest contestant, but rather to guess who others will think is the prettiest. In other words, it introduces the problem of endless regression, and indeterminacy. As a practical matter, we have been carefully watching

how these products have traded relative to the VIX, for which a longer data series is available. Before conducting our 2009 long term model portfolio rebalancing (which we skipped in 2007 because of the crisis we saw on the horizon), we need to develop some confidence about the potential returns on these products and how they would likely relate to the returns on other asset classes. As I said at the outset, we're cautiously optimistic that the end result will be an enhanced ability to hedge away portfolio tail risk at an acceptable price.

Last month you reviewed commercial property as an asset class and adjusted your views based on recent trends. How do you balance the evil of "recency bias" with the good of adapting to truly new information about permanent changes?

We couldn't agree with you more on the point you raise, as we worry about it too. Our starting point in thinking about it is that our conclusions can't simply be the result of a mechanical comparison of returns. Rather, any change in our views of commercial property as an asset class has to be based on structural changes that will have a long term impact. As we discussed in last month's article, the commercial property sector does not lack for structural changes in recent years, including the introduction of the REIT structure in many countries, the changing composition of various indexes, the opening up of new asset classes to investment (e.g., real return bonds and commodities) and changes in demographics, credit markets, and economic structure in many economies. On the other hand, some of what makes commercial property distinctive remains timeless – its return generating process is different from other asset classes, it provides a high level of current income, and it throughout history it has usually been a safe store of value, especially in places and periods when government bonds failed to meet this test. As we noted last month, all of these factors have led us to conclude that the case for securitized commercial property as a broad asset class seems to have become weaker, not just because of its poor recent performance, but also because of structural changes underway in this sector. However, this isn't the same thing as saying there is no place in a portfolio for a high quality commercial property – e.g. great location, quality tenants, conservatively financed, etc. A good

analogy is probably the way our view of commodities as an asset class has evolved over the years, as structural changes have taken place in that sector. We are now in the same “rethinking process” with respect to commercial property, as we believe lots of other investors are too. Hopefully last month’s article will stimulate people’s thinking, and help us all to make better decisions about this issue.

Global Asset Class Returns

| YTD 30 Jun 09 | In USD | In AUD | In CAD | In EURO | In JPY | In GBP | In CHF | In INR |
|-----------------------|---------|---------|---------|---------|---------|---------|---------|---------|
| Asset Held | | | | | | | | |
| USD Bonds | 2.10% | -13.86% | -4.20% | 1.19% | 8.15% | -12.44% | 4.23% | 0.39% |
| USD Prop. | -11.69% | -27.65% | -17.99% | -12.60% | -5.64% | -26.23% | -9.56% | -13.40% |
| USD Equity | 4.40% | -11.56% | -1.90% | 3.49% | 10.45% | -10.14% | 6.53% | 2.69% |
| | | | | | | | | |
| AUD Bonds | 2.14% | -13.82% | -4.16% | 1.23% | 8.19% | -12.40% | 4.27% | 0.44% |
| AUD Prop. | 2.40% | -13.56% | -3.89% | 1.50% | 8.45% | -12.14% | 4.53% | 0.70% |
| AUD Equity | 24.07% | 8.10% | 17.77% | 23.16% | 30.11% | 9.53% | 26.20% | 22.36% |
| | | | | | | | | |
| CAD Bonds | 5.95% | -10.02% | -0.35% | 5.04% | 11.99% | -8.60% | 8.08% | 4.24% |
| CAD Prop. | 22.95% | 6.99% | 16.66% | 22.05% | 29.00% | 8.41% | 25.08% | 21.25% |
| CAD Equity | 23.71% | 7.75% | 17.42% | 22.81% | 29.76% | 9.17% | 25.84% | 22.01% |
| | | | | | | | | |
| CHF Bonds | 5.34% | -10.62% | -0.95% | 4.44% | 11.39% | -9.20% | 7.47% | 3.64% |
| CHF Prop. | 4.38% | -11.58% | -1.92% | 3.47% | 10.43% | -10.16% | 6.51% | 2.68% |
| CHF Equity | -3.07% | -19.03% | -9.37% | -3.98% | 2.98% | -17.61% | -0.94% | -4.77% |
| | | | | | | | | |
| INR Bonds | -2.03% | -17.99% | -8.32% | -2.93% | 4.02% | -16.57% | 0.10% | -3.73% |
| INR Equity | 52.41% | 36.44% | 46.11% | 51.50% | 58.46% | 37.87% | 54.54% | 50.70% |
| | | | | | | | | |
| EUR Bonds | -3.08% | -19.05% | -9.38% | -3.99% | 2.96% | -17.63% | -0.95% | -4.79% |
| EUR Prop. | 3.38% | -12.58% | -2.92% | 2.47% | 9.43% | -11.16% | 5.51% | 1.67% |
| EUR Equity | 0.73% | -15.23% | -5.57% | -0.18% | 6.78% | -13.81% | 2.86% | -0.98% |
| | | | | | | | | |
| JPY Bonds | -8.10% | -24.06% | -14.39% | -9.01% | -2.05% | -22.64% | -5.97% | -9.80% |
| JPY Prop. | 5.28% | -10.68% | -1.01% | 4.38% | 11.33% | -9.26% | 7.41% | 3.58% |
| JPY Equity | -1.04% | -17.01% | -7.34% | -1.95% | 5.00% | -15.59% | 1.08% | -2.75% |
| | | | | | | | | |
| GBP Bonds | 12.12% | -3.84% | 5.83% | 11.22% | 18.17% | -2.42% | 14.25% | 10.42% |
| GBP Prop. | -1.46% | -17.42% | -7.76% | -2.37% | 4.59% | -16.00% | 0.67% | -3.17% |
| GBP Equity | 11.41% | -4.55% | 5.11% | 10.50% | 17.46% | -3.13% | 13.54% | 9.70% |
| | | | | | | | | |
| 1-3 Yr US Govt | -0.29% | -16.25% | -6.59% | -1.20% | 5.76% | -14.83% | 1.84% | -1.99% |
| World Bonds | 1.98% | -13.98% | -4.31% | 1.08% | 8.03% | -12.56% | 4.11% | 0.28% |
| World Prop. | -1.77% | -17.73% | -8.06% | -2.67% | 4.28% | -16.31% | 0.36% | -3.47% |
| World Equity | 6.91% | -9.05% | 0.62% | 6.01% | 12.96% | -7.63% | 9.04% | 5.21% |
| Commod Long | 5.54% | -10.42% | -0.75% | 4.63% | 11.59% | -9.00% | 7.67% | 3.84% |
| Commod L/Shrt | -11.50% | -27.46% | -17.79% | -12.40% | -5.45% | -26.04% | -9.37% | -13.20% |
| Gold | 5.39% | -10.58% | -0.91% | 4.48% | 11.43% | -9.16% | 7.51% | 3.68% |
| Timber | -7.46% | -23.43% | -13.76% | -8.37% | -1.42% | -22.01% | -5.34% | -9.17% |
| Uncorrel Alpha | 5.32% | -10.64% | -0.97% | 4.42% | 11.37% | -9.22% | 7.45% | 3.62% |
| Volatility VIX | -34.13% | -50.09% | -40.42% | -35.03% | -28.08% | -48.67% | -32.00% | -35.83% |
| Currency | | | | | | | | |
| AUD | 15.96% | 0.00% | 9.67% | 15.06% | 22.01% | 1.42% | 18.09% | 14.26% |

| YTD 30 Jun 09 | In USD | In AUD | In CAD | In EURO | In JPY | In GBP | In CHF | In INR |
|----------------------|---------------|---------------|---------------|----------------|---------------|---------------|---------------|---------------|
| CAD | 6.30% | -9.67% | 0.00% | 5.39% | 12.34% | -8.25% | 8.43% | 4.59% |
| EUR | 0.91% | -15.06% | -5.39% | 0.00% | 6.95% | -13.64% | 3.04% | -0.80% |
| JPY | -6.05% | -22.01% | -12.34% | -6.95% | 0.00% | -20.59% | -3.92% | -7.75% |
| GBP | 14.54% | -1.42% | 8.25% | 13.64% | 20.59% | 0.00% | 16.67% | 12.84% |
| USD | 0.00% | -15.96% | -6.30% | -0.91% | 6.05% | -14.54% | 2.13% | -1.71% |
| CHF | -2.13% | -18.09% | -8.43% | -3.04% | 3.92% | -16.67% | 0.00% | -3.83% |
| INR | 1.71% | -14.26% | -4.59% | 0.80% | 7.75% | -12.84% | 3.83% | 0.00% |

Uncorrelated Alpha Strategies Detail

| YTD 30 Jun 09 | In USD | In AUD | In CAD | In EURO | In JPY | In GBP | In CHF | In INR |
|-----------------------|---------------|---------------|---------------|----------------|---------------|---------------|---------------|---------------|
| Eq Mkt Neutral | | | | | | | | |
| HSKAX | -2.07% | -18.04% | -8.37% | -2.98% | 3.97% | -16.62% | 0.05% | -3.78% |
| OGNAX | 1.39% | -14.57% | -4.91% | 0.48% | 7.44% | -13.15% | 3.52% | -0.31% |
| Arbitrage | | | | | | | | |
| ARBFX | -11.51% | -27.47% | -17.80% | -12.41% | -5.46% | -26.05% | -9.38% | -13.21% |
| ADANX | 26.80% | 10.84% | 20.50% | 25.89% | 32.85% | 12.26% | 28.93% | 25.09% |
| Currency | | | | | | | | |
| DBV | 10.76% | -5.20% | 4.47% | 9.86% | 16.81% | -3.78% | 12.89% | 9.06% |
| ICI | 1.33% | -14.64% | -4.97% | 0.42% | 7.38% | -13.21% | 3.46% | -0.38% |
| Equity L/S | | | | | | | | |
| HSGFX | 6.21% | -9.75% | -0.08% | 5.31% | 12.26% | -8.33% | 8.34% | 4.51% |
| PTFAX | 6.59% | -9.37% | 0.30% | 5.69% | 12.64% | -7.95% | 8.72% | 4.89% |
| GTAA | | | | | | | | |
| MDLOX | 6.15% | -9.82% | -0.15% | 5.24% | 12.19% | -8.40% | 8.27% | 4.44% |
| PASAX | 7.57% | -8.39% | 1.27% | 6.66% | 13.62% | -6.97% | 9.70% | 5.86% |

Global Asset Class Valuation Updates

Our asset class valuation analyses are based on the belief that financial markets are complex adaptive systems, in which prices and returns emerge from the interaction of multiple rational, emotional and social processes. We further believe that while this system is attracted to equilibrium, it is generally not in this state. To put it differently, we believe it is possible for the supply of future returns a market is expected to provide to be higher or lower than the returns investors logically demand, resulting in over or undervaluation. The attraction of the system to equilibrium means that, at some point, these situations are likely to reverse in the direction of their fundamental valuation. 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 this 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 substantially increase the probability that they will achieve their long term goals. This is the painful lesson learned by too many investors in the 2001 tech stock crash, and then learned again in the 2007-2008 crash of multiple asset classes.

We also believe that the use of a consistent quantitative approach to assessing fundamental asset class valuation helps to overcome normal human tendencies towards over-optimism, overconfidence, wishful thinking, and other biases that can cause investors to make decisions they later regret. Finally, we stress that our monthly market valuation update is only a snapshot in time, and says nothing about whether apparent over and undervaluations will in the future become more extreme before they inevitably reverse. That said, when momentum is strong and quickly moving prices far away from their fundamental values, it is usually a good indication a turning point is near.

Equity Markets

In the case of an equity market, we define the future supply of returns to be equal to the current dividend yield plus the rate at which dividends are expected to grow in the future. We define the return investors demand as the current yield on real return government bonds plus an equity market risk premium. While this approach emphasizes fundamental valuation, it does have an implied linkage to the investor behavior factors that also affect valuations. On the supply side of our framework, investors under the influence of fear or euphoria (or social pressure) can deflate or inflate the long-term real growth rate we use in our analysis. Similarly, fearful investors will add an uncertainty premium to our long-term risk premium, while euphoric investors will subtract an “overconfidence discount.” As you can see, euphoric investors will overestimate long-term growth, underestimate long-term risk, and consequently drive prices higher than warranted. In our framework, this depresses the dividend yield, and will cause stocks to appear overvalued. The opposite happens under conditions of intense fear. To put it differently, in our framework, it is investor behavior and overreaction that drive valuations away from the levels warranted by the fundamentals. As described in our November 2008 article “Are Emerging Market Equities Undervalued?”, people can and do disagree about the “right” values for the variables we use in our fundamental analysis. Recognizing this, we present four valuation scenarios for an equity market, based on different values for three key variables. First, we use both the current dividend yield and the dividend yield adjusted upward by .50% to reflect share repurchases. Second, we define future dividend growth to be equal to the long-term rate of total (multifactor) productivity growth. For this variable, we use two different values, 1% or 2%. Third, we also use two different values for the equity risk premium required by investors: 2.5% and 4.0%. Different combinations of all these variables yield high and low scenarios for both the future returns the market is expected to supply (dividend yield plus growth rate), and the future returns investors will demand (real bond yield plus equity risk premium). We then use the dividend discount model to combine these scenarios, to produce four

different views of whether an equity market is over, under, or fairly valued today. The specific formula is $(\text{Current Dividend Yield} \times 100) \times (1 + \text{Forecast Productivity Growth})$ divided by $(\text{Current Yield on Real Return Bonds} + \text{Equity Risk Premium} - \text{Forecast Productivity Growth})$. Our valuation estimates are shown in the following tables, where a value greater than 100% implies overvaluation, and less than 100% implies undervaluation. In our view, the greater the number of scenarios that point to overvaluation or undervaluation, the greater the probability that is likely to be the case.

Equity Market Valuation Analysis at 30 June 2009

| <i>Australia</i> | Low Demanded Return | High Demanded Return |
|-----------------------------|----------------------------|-----------------------------|
| High Supplied Return | 57% | 81% |
| Low Supplied Return | 80% | 107% |

| <i>Canada</i> | Low Demanded Return | High Demanded Return |
|-----------------------------|----------------------------|-----------------------------|
| High Supplied Return | 75% | 122% |
| Low Supplied Return | 128% | 185% |

| <i>Eurozone</i> | Low Demanded Return | High Demanded Return |
|-----------------------------|----------------------------|-----------------------------|
| High Supplied Return | 48% | 77% |
| Low Supplied Return | 76% | 108% |

| <i>Japan</i> | Low Demanded Return | High Demanded Return |
|-----------------------------|----------------------------|-----------------------------|
| High Supplied Return | 124% | 179% |
| Low Supplied Return | 199% | 267% |

| <i>United Kingdom</i> | Low Demanded Return | High Demanded Return |
|-----------------------------|----------------------------|-----------------------------|
| High Supplied Return | 27% | 56% |
| Low Supplied Return | 52% | 84% |

| <i>United States</i> | Low Demanded Return | High Demanded Return |
|-----------------------------|----------------------------|-----------------------------|
| High Supplied Return | 86% | 141% |
| Low Supplied Return | 152% | 220% |

| <i>Switzerland</i> | Low Demanded Return | High Demanded Return |
|-----------------------------|----------------------------|-----------------------------|
| High Supplied Return | 75% | 118% |
| Low Supplied Return | 123% | 230% |

| <i>India</i> | Low Demanded Return | High Demanded Return |
|-----------------------------|----------------------------|-----------------------------|
| High Supplied Return | 92% | 177% |
| Low Supplied Return | 213% | 335% |

| <i>Emerging Markets</i> | Low Demanded Return | High Demanded Return |
|-----------------------------|----------------------------|-----------------------------|
| High Supplied Return | 85% | 158% |
| Low Supplied Return | 119% | 192% |

In our view, the key point to keep in mind with respect to equity market valuations is the level of the current dividend yield, which history has shown to be the key driver of long-term real equity returns in most markets. The recent rise in uncertainty has undoubtedly increased many investors' required risk and uncertainty premium above the long-term average, while simultaneously decreasing their long-term real growth forecasts. The net result has been a fall in equity prices that has caused dividend yields to increase. From the perspective of an investor with long-term risk and growth assumptions in the range we use in our model, this increase in dividend yields has more than offset the simultaneous rise in real bond yields, and caused at least some equity markets to appear undervalued. That said, many companies are cutting dividends at a pace not seen since the 1930s. Hence the numerator of our dividend/yield calculation may well further decline in the months ahead, which, all else

being equal, should further depress prices. In sum, we believe that rather than trying to catch the bottom of different equity markets, most investors are best advised to either wait or commence a staged increase in their equity allocations.

Government Bond Markets

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

Bond Market Analysis as of 30 June 09

| | Current Real Rate* | Average Inflation Premium (89-03) | Required Nominal Return | Nominal Return Supplied (10 year Govt) | Yield Gap | Asset Class Over or (Under) Valuation, based on 10 year zero |
|-----------|---------------------------|--|--------------------------------|---|------------------|---|
| Australia | 3.05% | 2.96% | 6.01% | 5.64% | -0.37% | 3.58% |
| Canada | 1.86% | 2.40% | 4.26% | 3.36% | -0.90% | 9.03% |
| Eurozone | 2.02% | 2.37% | 4.39% | 3.37% | -1.02% | 10.29% |
| Japan | 2.92% | 0.77% | 3.69% | 1.39% | -2.30% | 25.19% |
| UK | 0.90% | 3.17% | 4.07% | 3.69% | -0.38% | 3.75% |
| USA | 1.88% | 2.93% | 4.81% | 3.53% | -1.28% | 13.10% |
| Switz. | 2.11% | 2.03% | 4.14% | 2.33% | -1.81% | 19.11% |
| India | 2.11% | 7.57% | 9.68% | 6.70% | -2.98% | 31.67% |

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

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

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

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

Real Return Bonds

Let us now move on to a closer look at the current level of real interest rates. In keeping with our basic approach, we will start by looking at the theoretical basis for determining the rate of return an investor should demand in exchange for making a

one year risk free investment. The so-called Ramsey equation tells us that this should be a function of a number of variables. The first is our “time preference”, or the rate at which we trade-off a unit of consumption in the future for one today, assuming no growth in the amount of goods and services produced by the economy. As is often the case, the correct value for this parameter is the subject of much debate. For example, this lies at the heart of the debate over how much we should be willing to spend today to limit the worst effects of climate change in the future. In our analysis, we assume the average time preference is two percent per year. However, it is not the case that the economy does not grow; hence, the risk free rate we require should reflect the fact that there will be more goods and services available in the future than there are today. Assuming investors try to smooth their consumption over time, the risk free rate should also contain a term that takes the growth rate of the economy into account. Broadly speaking, this growth rate is a function of the increase in the labor supply and the increase in labor productivity. However, the latter comes from both growth in the amount of capital per worker and from growth in “total factor productivity”, which is due to a range of factors, including better organization, technology and education. Since capital/worker cannot be increased without limit, over the long-run it is growth in total factor productivity that counts. Hence, in our analysis, we assume that future economic growth reflects the growth in the labor force and TFP. However, this future growth is not guaranteed; rather, there is an element of uncertainty involved. Hence we also need to take investor’s aversion to risk and uncertainty into account when estimating the risk free rate of return they should require in exchange for letting others use their capital for one year. There are many ways to measure this, and unsurprisingly, many people disagree on the right approach to use. In our analysis, we have used Constant Relative Risk Aversion with an average value of three (see “How Risk Averse are Fund Managers?” by Thomas Flavin). The following table brings these factors together to determine our estimate of the risk free rate investors in different currency zones should logically demand in equilibrium (for an excellent discussion of the issues noted above, and their practical importance, see “The Stern Review of the Economics of Climate Change” by Martin Weitzman):

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

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

The next table compares this long-term equilibrium real risk free rate with the real risk free return that is currently supplied in the market. Negative values indicate that real return bonds are currently overvalued, as their prices must fall in order for their yields (i.e., the returns they supply) to rise. The valuation is based on a comparison of the present values of ten year zero coupon bonds offering the rate demanded and the rate supplied, as of **30 June 2009**.

| Region | Risk Free Rate Demanded | Actual Risk Free Rate Supplied | Difference | Overvaluation (>100) or Undervaluation (<100) |
|----------------|-------------------------|--------------------------------|------------|---|
| Australia | 3.2 | 3.1 | -0.1 | 101 |
| Canada | 3.8 | 1.9 | -1.9 | 120 |
| Eurozone | 3.9 | 2.0 | -1.9 | 120 |
| Japan | 3.8 | 2.9 | -0.9 | 109 |
| United Kingdom | 3.8 | 0.9 | -2.9 | 133 |
| United States | 3.5 | 1.9 | -1.6 | 117 |

We reiterate that this analysis is based on a medium term view of the logical value of the risk free real return investors should demand. For example, plunging consumer spending around the world implies a lower time preference rate than the 2.0% we have

used in our analysis, which would reduce the apparent overvaluation of this asset class.

Credit Spreads

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

The following table shows the statistics of the distribution of these spreads between January, 1986 and December, 2008 (based on daily Federal Reserve data – 11,642 data points). Particularly in the case of the BAA spread, it is clear we are not dealing with a normal distribution!

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

At **30 June 2009**, the AAA minus 10 year Treasury spread was 1.84%. The AAA minus BAA spread was 1.80%. Since these distributions are not normal (i.e.,

they do not have a “bell curve” shape), we take a different approach to putting them in perspective. Over the past twenty three years, there have been only 582 days with a higher AAA spread (5.0% of all days) and 70 days with a higher BAA spread (.60% of all days in our sample). Clearly, and despite all the talk one hears about “green shoots”, current spreads still reflect relatively extreme investor uncertainty about future liquidity and credit risk, even after the BBB spread over the AAA rate fell by 60 basis points last month. However, given the uncharted economic waters through which we are now passing, and our belief that the conventional wisdom underestimates the amount of trouble on the horizon, we believe that these spread probably reflect the undervaluation of liquidity and credit risk.

Currencies

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

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

exchange markets who are not profit maximizers, carry trades are often profitable, at least over short time horizons (for an excellent analysis of the sources of carry trade profits – of which 25% may represent a so-called “disaster risk premium”, see “Crash Risk in Currency Markets” by Farhi, Frailberger, Gabaix, Ranciere and Verdelhan). Our expected medium to long-term changes in exchange rates are summarized in the following table:

Annual Exchange Rate Changes Implied by Bond Market Yields on 30 June 09

| | To AUD | To CAD | To EUR | To JPY | To GBP | To USD | To CHF | To INR |
|------------|--------|--------|--------|--------|--------|--------|--------|--------|
| From | | | | | | | | |
| AUD | 0.00% | -2.28% | -2.27% | -4.25% | -1.95% | -2.11% | -3.31% | 1.06% |
| CAD | 2.28% | 0.00% | 0.01% | -1.97% | 0.33% | 0.17% | -1.03% | 3.34% |
| EUR | 2.27% | -0.01% | 0.00% | -1.98% | 0.32% | 0.16% | -1.04% | 3.33% |
| JPY | 4.25% | 1.97% | 1.98% | 0.00% | 2.30% | 2.14% | 0.94% | 5.31% |
| GBP | 1.95% | -0.33% | -0.32% | -2.30% | 0.00% | -0.16% | -1.36% | 3.01% |
| USD | 2.11% | -0.17% | -0.16% | -2.14% | 0.16% | 0.00% | -1.20% | 3.17% |
| CHF | 3.31% | 1.03% | 1.04% | -0.94% | 1.36% | 1.20% | 0.00% | 4.37% |
| INR | -1.06% | -3.34% | -3.33% | -5.31% | -3.01% | -3.17% | -4.37% | 0.00% |

Commercial Property

Our approach to valuing commercial property securities as an asset class is also based on the expected supply of and demand for returns, utilizing the same mix of fundamental and investor behavior factors we use in our approach to equity valuation. Similar to equities, the supply of returns equals the current dividend yield on an index covering publicly traded commercial property securities, plus the expected real growth rate of net operating income (NOI). A number of studies have found that real NOI growth has been basically flat over long periods of time (with apartments showing the strongest rates of real growth). This is in line with what economic theory predicts, with increases in real rent lead to an increase in property supply, which eventually causes real rents to fall. Our analysis also assumes that over the long-term, investors require a 3.0% risk premium above the yield on real return bonds as compensation for bearing the risk of securitized commercial property as an asset class

(see this month's feature article on commercial property as an asset class). Last but not least, there is significant research evidence that commercial property markets are frequently out of equilibrium, due to slow adjustment processes as well as the interaction between fundamental factors and investors' emotions (see, for example, "Investor Rationality: An Analysis of NCREIF Commercial Property Data" by Hendershott and MacGregor; "Real Estate Market Fundamentals and Asset Pricing" by Sivitanides, Torto, and Wheaton; "Expected Returns and Expected Growth in Rents of Commercial Real Estate" by Plazzi, Torous, and Valkanov; and "Commercial Real Estate Valuation: Fundamentals versus Investor Sentiment" by Clayton, Ling, and Naranjo). Hence, it is extremely hard to forecast how long it will take for any over or undervaluations we identify to be reversed. The following table shows the results of our valuation analysis as of **30 June 2009**: We use the dividend discount model approach to produce our estimate of whether a property market is over, under, or fairly valued today. The specific formula is $(\text{Current Dividend Yield} \times 100) \times (1 + \text{Forecast NOI Growth})$ divided by $(\text{Current Yield on Real Return Bonds} + \text{Property Risk Premium} - \text{Forecast NOI Growth})$. Our estimates are shown in the following tables, where a value greater than 100% implies overvaluation, and less than 100% implies undervaluation.

| Country | Dividend Yield | Plus LT Real Growth Rate | Equals Supply of Returns | Real Bond Yield | Plus LT Comm Prop Risk Premium | Equals Returns Demanded | Over or Undervaluation (100% = Fair Value) |
|---------------|----------------|--------------------------|--------------------------|-----------------|--------------------------------|-------------------------|--|
| Australia | 6.8% | 0.2% | 7.0% | 3.1% | 3.0% | 6.1% | 86% |
| Canada | 7.8% | 0.2% | 8.0% | 1.9% | 3.0% | 4.9% | 60% |
| Eurozone | 8.9% | 0.2% | 9.1% | 2.0% | 3.0% | 5.0% | 54% |
| Japan | 7.9% | 0.2% | 8.1% | 2.9% | 3.0% | 5.9% | 72% |
| Switzerland | 4.5% | 0.2% | 4.7% | 2.1% | 3.0% | 5.1% | 109% |
| U.K. | 4.4% | 0.2% | 4.6% | 0.9% | 3.0% | 3.9% | 84% |
| United States | 7.1% | 0.2% | 7.3% | 1.9% | 3.0% | 4.9% | 66% |

**Using the current dividend yield, the valuation of the Swiss property market appears to be significantly out of line with the others. Hence, we substituted the 2008 year-end*

income yield on directly owned commercial property in Switzerland (4.5%) for the dividend yield on publicly traded property securities.

Commodities

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

risk premium in our analysis (though reasonable people can still differ about what it should be), because of the hedging benefits commodities provide relative to equities. This is consistent with the history of equities, where realized ex-post premiums have been shown to be larger than the ex-ante premiums investors should logically have expected.

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

The second source of the return on a long-only commodity index fund is the so-called “roll yield.” Operationally, a commodity index fund buys futures contracts in the most liquid part of the market, which is usually limited to the near term. As these contracts near their expiration date, they are sold and replaced with new futures contracts. For example, a fund might buy contracts maturing in two or three months, and sell them when they approached maturity. The “roll yield” refers to the gains and losses realized by the fund on these sales. If spot prices (i.e., the price to buy the physical commodity today, towards which futures prices will move as they draw closer to expiration) are higher than two or three month futures, the fund will be selling high and buying low, and thus earning a positive roll yield. When a futures market is in this condition, it is said to be in “backwardation.” On the other hand, if the spot price is lower than the two or three month's futures price, the market is said to be in “contango” and the roll yield will be negative (i.e., the fund will sell low and buy high). The interesting issue is what causes a commodity to be either backwardated or

contangoed. A number of theories have been offered to explain this phenomenon. The one that seems to have accumulated the most supporting evidence to date is the so-called “Theory of Storage”: begins with the observation that, all else being equal, contango should be the normal state of affairs, since a person buying a commodity at spot today and wishing to lock in a profit by selling a futures contract will have to incur storage and financing costs. In addition to his or her profit margin, storage and financing costs should cause the futures price to be higher than the spot price, and normal roll yields to be negative.

However, in the real world, all things are not equal. For example, some commodities are very difficult or expensive to store; others have very high costs if you run out of them (e.g., because of rapidly rising demand relative to supply, or a potential disruption of supply). For these commodities, there may be a significant option value to holding the physical product (the Theory of Storage refers to this option value as the “convenience yield”). If this option value is sufficiently high, spot prices may be bid up above futures prices, causing “backwardation” and positive roll-yields for commodity index funds. Hence, a key question is the extent to which different commodities within a given commodity index tend to be in backwardation or contango over time. Historically, most commodities have spent time in both states. However, contango has generally been more common, but not equally so for all commodities. For example, oil has spent relatively more time in backwardation, as have copper, sugar, soybean meal and lean hogs. 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. For example, ten commodities make up roughly 75% of the value of the Dow Jones AIG Commodities Index. The current term structures of their futures curves are as follows on **30 June 2009**:

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

Given the continued presence of so many contangoed futures curves, expected near term roll returns on the DJAIG as a whole are still negative, absent major supply side shocks. On a weighted basis, the forward premium (relative to the spot price) has grown from 3.59% to 5.70% over the past month. However, we also note that under these conditions, commodity funds that can take short as well as long positions may still deliver positive returns.

The third source of commodity futures return is unexpected changes in the price of the commodity during the term of the futures contract. It is important to stress that the market's consensus about the expected change in the spot price is already included in the futures price. The source of return we are referring to here is the unexpected portion of the actual change. This return driver probably offers investors the best chance of making profitable forecasts, since most human beings find it extremely difficult to accurately understand situations where cause and effect are significantly separated in time (e.g., failure to recognize how fast rising house prices would – albeit with a time delay – trigger an enormous increase in new supply).

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 positive roll returns. In **June 2009**, we saw apparently contradictory price conditions in some commodity markets. While there are few signs of economic recovery, prices of some commodities have seen strong gains, which many have (in a type of circular argument) taken to be a sign of the recovery they hope to see. However, over the last month, new information from China has led many to conclude that much of the apparent increase in demand for commodities has been driven not by increased growth, but rather by speculative buying financed with the very aggressive expansion of credit that has been underway in China. Hence the most likely price surprise seems to be a reduction in the conventional wisdom's expectations for future demand. On the other hand, there could still be changes in expected supply that either occur suddenly and are extremely hard to forecast (e.g., a weather or terrorist related incident) or changes that investors may have not yet fully incorporated into their valuation models (e.g., the faster than expected decline in oil production from current reservoirs, or in gas production from shale reservoirs). On balance, however, at this point we view negative surprises on the demand side that depress commodity prices as more likely than supply surprises that have the opposite effect.

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

So, to sum up, the expected supply of returns from a commodity index fund over a given period of time equals (1) the current yield on real return bonds, reduced by the percentage of funds used to purchase the futures contracts; (2) expected roll

yields, adjusted for commodities' respective weights in the index; (3) unexpected spot price changes; and (4) the expected rebalancing return. Of these, the yield on real return bonds can be observed, and we can conservatively assume a long-term rebalancing return of, for example, 1.0%. These two sources of return are clearly less than the demand for returns that are equal to the real rate plus a risk premium of, say, 3.0%. The difference must be made up by a combination of roll returns (which, given the current shape of futures curves, are likely to be negative in the near term) and unexpected price changes, due to sudden changes in demand (where downside surprises currently seem more likely than upside surprises) and/or supply (where the best chance of a positive return driver seems to be incomplete investor recognition of slowing oil production from large reservoirs and/or the medium term impact of the current sharp cutback in E&P and refining investments).

Another approach to assessing the valuation of commodities as an asset class is to compare the current value of the DJAIG Index to its long-term average. Between 1991 and 2008, the inflation adjusted (i.e., real) DJAIG had an average value of 91.61, with a standard deviation of 16.0 (skewness of .52, and kurtosis of -.13 – i.e., it was close to normal). The inflation adjusted **30 June 2009** closing value of 78.12 was .84 standard deviations below the long term average. Assuming the value of the index is normally distributed around its historical average (which in this case is approximately correct), a value within one standard deviation of the average should occur about 67% of the time, and a value within two standard deviations 95% of the time. Whether the current level of the inflation adjusted DJAIG signifies that commodities are undervalued depends upon one's outlook for future roll returns and price surprises.

Two factors argue in favor of undervaluation. The first is the large amount of monetary easing underway in the world, which, at some point, will likely lead to higher inflation. The second factor is the equally large amount of fiscal stimulus being applied to the global economy, with its focus on infrastructure projects and clean fuels, both of which should eventually boost demand for commodities (and indirectly boost economic growth in commodity exporting countries like Australia and Canada). Gold prices should also benefit from rising investor uncertainty and/or worries about future

inflation, which should generate higher retail flows into the expanding range of gold ETF products that make easier to invest in this commodity.

The argument in favor of a negative view on commodity valuations is (as more fully discussed in our Economic Update) is based on the continued failure to resolve three critical problems that underlie this global recession: excessive consumer debt, insolvent banks, and substantial world current account imbalances. Until these core issues are resolved, the impact of fiscal stimulus on global growth (and hence commodity prices) is likely to be limited, though still positive. After weighing these two views, we conclude that at the end of **June 2009** commodities are likely overvalued today, while gold is possibly undervalued.

Timber

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). We note that, since PCL and RYN are listed securities, investors should not demand a liquidity premium for holding them, as they would in the case of an investment in a TIMO Limited Partnership (Timber Management Organization). Two of the variables we use in our valuation analysis are readily available: the dividend yields on the timber REITS and the yield on real return bonds. The other two variables have to be estimated, which presents a particularly difficult challenge with respect to the rate at which dividends will grow in the future.

In broad terms, the rate of dividend growth results from the interaction of physical, and economic processes. In the first part of the physical process, trees grow, adding a certain amount of mass each year. The exact rate depends on the mix of trees (e.g., southern pine grows much faster than northern hardwoods), on

silviculture techniques employed (e.g., fertilization, thinning, etc.), and weather and other natural factors (e.g., fires, drought, and beetle invasions). In the second part of the physical process, a certain amount of trees are harvested each year, and sold to provide revenue to the timber REIT. In the economic area, three processes are important. As trees grow, they can be harvested to make increasingly valuable products, starting with pulpwood when they are young, and sawtimber when they reach full maturity. This value increasing process is known as “in-growth.” The speed and extent to which in-growth increased value depends on the type of tree; in general, this process produces greater value growth for hardwoods (whose physical growth is slower) than it does for pines and other fast-growing softwoods. The second economic process (or, more accurately, processes) is the interaction of supply and demand that determines changes in real prices for pulpwood, sawtimber and other forest products. As is true in the case of commodities, there is likely to be an asymmetry at work with respect to the impact of these processes, with prices reacting more quickly to more visible changes in demand, while changes in supply side factors (which only happen with a significant time delay) are more likely to generate surprises. In North America., a good example of this may be the eventual supply side and price impact of the mountain pine beetle epidemic that has been spreading through the northwestern forests of the United States and Canada.

The IMF produces a global timber price index that captures the net impact of demand and supply fluctuations, which is further broken down into hardwood and softwood. The average annual change in real prices (derived by adjusting the IMF series for changes in U.S. inflation) between 1981 and 2007 are shown in the following table:

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

As you can see, over the long term, prices have been quite stable in real terms, though with a high degree of volatility from year to year (and additional volatility across

different regional markets). The final economic process that affects the growth rate of dividends is changes in the REIT's cost structure, and non-timber related revenue streams (e.g., from selling timber land for real estate development). With respect to the latter, the potential imposition of carbon taxes or cap and trade systems for carbon emissions could provide a new source of revenue for timber REITs in the future. Last but not least, with rising interest in limiting global CO₂ emissions, timberlands have another potential source of value – their ability to convert CO₂ to oxygen. Accurate estimation of this value is not possible in the absence of an economic system for managing CO₂ emissions, be it a cap-and-trade or tax-based approach (for an early attempt at establishing this value, see “Economic Valuation of Forest Ecosystem Services” by Chiabai, Travisi, Ding, Markandya and Nunes).

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

| Growth Driver | Assumption |
|-------------------------------------|---|
| Biological growth of trees | We assume 6% as the long term average for a diversified timberland portfolio. |
| Harvesting rate | As a long term average, we assume that 5% of tree volume is harvested each year. |
| In-growth of trees | We assume this adds 3% per year to the value of timber assets, assuming no change in the real price of pulpwood, sawtimber and other final products. |
| Change in prices of timber products | We assume that over the long term prices will just keep pace with inflation. However, there are indications that climate change is causing increasing tree deaths in some areas, which should lead to future real price increases (see “Western U.S. Forests Suffer Death by Degrees” by E. Pennisi, <i>Science</i> , 23Jan09). Hence our assumption is conservative. |
| Carbon credits | We assume no additional return from this potential source of value, which also appears to be conservative given forests' role in CO ₂ absorption. |

This leaves the question of the appropriate return premium to assume for the overall risk of investing in timber as an asset class. Historically, the difference between returns on the NCREIF 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 NCREIF 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 when they are most needed, and investors should therefore require a relatively low risk premium to hold this asset class.

Given these assumptions, our assessment of the valuation of the timber asset class at **30 June 2009** is shown in the following table. We use the dividend discount model approach to produce our estimate of whether timber is over, under, or fairly valued today. The specific formula is $(\text{Current Dividend Yield} \times 100) \times (1 + \text{Forecast Dividend Growth})$ divided by $(\text{Current Yield on Real Return Bonds} + \text{Timber Risk Premium} - \text{Forecast Dividend Growth})$. A value greater than 100% implies overvaluation, and less than 100% implies undervaluation.

| | |
|--|---------------------|
| Average Dividend Yield | 5.65% |
| Plus Long Term Annual Biological Growth | 6.00% |
| Less Percent of Physical Timber Stock Harvested Each Year | (5.00%) |
| Plus Average Annual Increase in Stock Value due to In-growth | 3.00% |
| Plus Long Term Real Annual Price Change | 0.00% |
| Plus Other Sources of Annual Value Increase (e.g., Carbon Credits) | 0.00% |
| Equals Average Annual Real Return Supplied | <u>9.65%</u> |
| Real Bond Yield | 1.88% |

| | |
|---|---------------------|
| Plus Risk Premium for Timber | 4.00% |
| Equals Average Annual Real Return Demanded | <u>5.88%</u> |
| Ratio of Returns Demanded/Returns Supplied Equals Valuation Ratio (less than 100% implies undervaluation) | <u>32%</u> |

Volatility

Our approach to assessing the current value of equity market volatility (as measured by the VIX index, which tracks the level of S&P 500 Index volatility implied by the current pricing of put and call options on this index) is similar to our approach to commodities. Between January 2, 1990 and December 30, 2008, the average daily value of the VIX Index was 19.70, with a standard deviation of 7.88 (skewness 2.28, kurtosis 9.71 – i.e., a very “non-normal” distribution). On **30 June 2009**, the VIX closed at 26.35, To put this in perspective, only 697 days, or 14.5% of our sample had higher closing values of the VIX. This high (by historical standards) level of implied volatility may still be too low, if (as described in this month’s economic update) investors’ rapidly rising hopes for a fast return to normalcy eventually meet with disappointment as the conflict scenario and/or a worsening global influenza pandemic develops. As we noted above with respect to commodities, despite the likely impact of fiscal stimulus on aggregate demand, and monetary growth on price levels (i.e., reducing the risk of prolonged deflation), the core issues that lie at the heart of the current recession remain unresolved. Critically, we do not believe that this information and its likely impact on future uncertainty levels has been fully incorporated into S&P 500 option prices, and hence into the VIX. For these reasons, at the end of **June 2009** we estimate that volatility is likely undervalued.

Sector and Style Rotation Watch

The following table shows a number of classic style and sector rotation strategies that attempt to generate above index returns by correctly forecasting turning

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

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

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

That being said, the highest rolling three month returns in the table do provide us with a rough indication of how investors expect the economy and interest rates to perform in the near future. *The highest returns in a given row indicate that a plurality of investors (as measured by the value of the assets they manage) are anticipating the economic and interest rate conditions noted at the top of the next column* (e.g., if long maturity bonds have the highest year to date returns, a plurality of bond investor opinion expects rates to fall in the near future). Comparing returns across strategies provides a rough indication of the extent of agreement (or disagreement) investors about the most likely upcoming changes in the state of the economy. When the rolling returns on different strategies indicate different conclusions about the most likely direction in which the economy is headed, we place the greatest weight on bond market indicators. Why? We start from a basic difference in the psychology of equity and bond investors. The different risk/return profiles for these two investments produce a different balance of optimism and pessimism. For equities, the downside is limited (in the case of bankruptcy) to the original value of the investment, while the upside is unlimited. This tends to produce an optimistic view of the world. For bonds, the upside is limited to the contracted rate of interest and getting your original investment back (assuming the bonds are held to maturity). In contrast, the downside is significantly greater – complete loss of principal. This tends to produce a more pessimistic (some might say realistic) view of the world (although some might argue that the growth of the credit derivatives market has undermined this discipline). As we have written many times, investors seeking to achieve a funding goal over a multi-year time horizon, avoiding big downside losses is 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
*Rolling 3 Month
Returns Through*
30 Jun 09

| | | | | |
|---------------------------------------|-------------------------------------|---------------------------------------|------------------------------------|--------------------------------------|
| <i>Economy</i> | Bottoming | Strengthening | Peaking | Weakening |
| <i>Interest Rates</i> | Falling | Bottom | Rising | Peak |
| <i>Style and Size Rotation</i> | Small Growth (DSG) 28.71% | Small Value (DSV) 23.68% | Large Value (ELV) 14.66% | Large Growth (ELG) 16.66% |
| <i>Sector Rotation</i> | Cyclicals (RXI) 22.17% | Industrials (EXI) 22.57% | Staples (KXI) 14.15% | Utilities (JXI) 14.11% |
| <i>Bond Market Rotation</i> | Higher Risk (HYG) 20.68% | Short Maturity (SHY) -0.20% | Low Risk (TIP) 0.35% | Long Maturity (TLT) -9.68% |

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 **June 2009**. Our starting point is that asset class valuations evolve in response to three forces. The first is fundamental valuation, as reflected in the balance between the expected supply of and demand for returns. The second is investor behavior, which results from a complex mix of cognitive, emotional and social inputs – the latter two comprising Keynes’ famous “animal spirits”. The third force is the ongoing evolution of political and economic conditions, and the degree of prevailing uncertainty about their future direction. We capture these longer term forces in our economic scenarios. This asset class valuation update contains an extensive discussion of fundamental valuation issues. Our current fundamental valuation estimates are summarized in the following table. The distinction between possible, likely and probable under or overvaluation reflects an increasing degree of confidence in our estimate. We stress that these conclusions represent our assessment of quantitative valuation indicators at a given point in time, which implies no forecast as to when any

over and undervaluations will be reversed. Indeed, before this reversal occurs current over and undervaluations could actually become more extreme. That said, common sense suggests that more extreme situations are more likely to be recognized and reversed.

To aid in that assessment, for each asset class we have also included the most recent three month rolling return (in local currency), as a means of capturing the direction and force of investor behavior. We believe that the likelihood and expected size of a reversal increase when fundamental over or undervaluation becomes more extreme (e.g., moves from possible to likely to probable) and there is evidence of strong returns momentum in the opposite direction (e.g., strong positive returns in the case of an asset class that is probably overvalued). However, conclusions about potential reversals and their likely durability also have to be tested against the likely evolution of future political/economic scenarios and their implications for asset class valuation and investor behavior over a longer time frame (see, for example, our March 2009 Economic Update). This is an important third input into investment decisions, as we do not believe that the full implications of these scenarios are typically reflected in current valuations and investor behavior.

Table: Valuation Conclusions and 3 Month Momentum

| <i>Valuation at 30 June 09</i> | <i>Fundamental Valuation Estimate</i> | <i>Rolling 3 Mos Return in Local Currency</i> |
|--------------------------------|--|--|
| AUD Real Bonds | Neutral | -3.46% |
| AUD Bonds | Neutral | -13.49% |
| AUD Prop. | Likely Undervalued | -13.56% |
| AUD Equity | Likely Undervalued | 17.94% |
| CAD Real Bonds | Possibly Overvalued | 7.75% |
| CAD Bonds | Possibly Overvalued | 1.25% |
| CAD Prop. | Probably Undervalued | 17.23% |
| CAD Equity | Likely Overvalued | 22.00% |

| <i>Valuation at 30 June 09</i> | Fundamental Valuation Estimate | Rolling 3 Mos Return in Local Currency |
|---|---|---|
| CHF Bonds | Likely Overvalued | -0.95% |
| CHF Property | Neutral | 10.72% |
| CHF Equity | Likely Overvalued | 5.72% |
| | | |
| EUR Real Bonds | Possibly Overvalued | 4.41% |
| EUR Bonds | Possibly Overvalued | -0.58% |
| EUR Prop. | Probably Undervalued | 2.10% |
| EUR Equity | Likely Undervalued | 0.61% |
| | | |
| GBP Real Bonds | Likely Overvalued | 2.19% |
| GBP Bonds | Neutral | 2.43% |
| GBP Property | Likely Undervalued | 7.99% |
| GBP Equity | Probably Undervalued | 7.22% |
| | | |
| INR Bonds | Probably Overvalued | -1.39% |
| INR Equity | Probably Overvalued | 54.25% |
| | | |
| JPY Real Bonds | Neutral | -0.87% |
| JPY Bonds | Probably Overvalued | -0.98% |
| JPY Property | Likely Undervalued | 25.75% |
| JPY Equity | Probably Overvalued | 20.62% |
| | | |
| USD Real Bonds | Possibly Overvalued | 4.52% |
| USD Bonds | Possibly Overvalued | 2.84% |
| USD Property | Probably Undervalued | 6.90% |
| USD Equity | Probably Overvalued | 13.80% |
| Following in USD: | | |
| Credit (HYG) | Likely Overvalued | 20.68% |
| Emerging Market Equity | Likely Overvalued | 26.58% |
| Commodities Long | Likely Overvalued | 11.24% |
| Gold | Possibly Undervalued | -10.57% |
| Timber | Probably Undervalued | -0.15% |
| Volatility (VIX) | Likely Undervalued | 8.56% |
| Return in Local for holding USD: | | |
| USD per AUD | Positive | -41.24% |
| USD per CAD | Neutral | |
| USD per EUR | Neutral | -22.76% |
| USD per JPY | Negative | -6.70% |

| <i>Valuation at 30 June 09</i> | <i>Fundamental Valuation Estimate</i> | <i>Rolling 3 Mos Return in Local Currency</i> |
|--------------------------------|---------------------------------------|---|
| USD per GBP | Neutral | -8.09% |
| USD per CHF | Negative | 7.06% |
| USD per INR | Positive | -14.31% |

July 2009 Economic and H1N1 Influenza Update

Our economic analysis methodology utilizes two alternative scenarios that are based on traditional attractors for complex social systems operating in far from equilibrium conditions. The first is enhanced cooperation and the second is higher levels of conflict. Realization of the cooperative scenario should result in a higher level of stability and predictability in the system's operations, while development of the conflict scenario will prolong and quite possibly worsen the system's instability. These scenarios are described in more detail in our previous issues, which (as you go back in time), also describe the scenarios that preceded them. Overall, our economic analysis process is best characterized as a rolling sequence of two alternative scenarios, one which is eventually discarded as the other develops and provides the starting point for two new scenarios that describe the ways events could evolve in the future.

We further assume that financial market returns reflect the complex interplay between political and economic conditions, which in turn reflect the actions of key groups (i.e., networks), which in turn are comprised of individuals whose behavior is based on an evolving mix of cognitive, informational, emotional and social factors. In our analysis, we use both bottom up and top down approaches to develop our scenarios and guide our search for information that provides insight about which of them is developing.

With respect to the situation we face today, we believe three issues must be resolved in order for the current "high uncertainty regime" to be replaced by a "normal growth regime" – (1) high levels of household debt across much of the Anglosphere;

(2) a deeply weakened world financial system; and (3) unsustainable structural imbalances in the economies of the United States and China, and in these countries' current account balances. We further believe that the actions of three groups – middle class Americans, Chinese peasants, and Iranian youth, are linchpins that could have an outsized impact on the future evolution of political and economic events, and, through them, on the resolution of the three critical issues we face and on future asset class valuations and returns.

Over the past month, the “green shoots” story that has boosted investor optimism has continued to weaken. This message was conveyed loud and clear by new reports from multiple institutions, even as much of the media was focused on rising oil prices and equity markets. In its Annual Report, the Bank for International Settlements – which sounded the strongest and most accurate warnings before the current crisis hit – summarized its views as follows: “The global financial crisis has led to an unprecedented recession accentuated by rapid declines in trade volumes, large employment cuts, and a massive loss of confidence. How deep and prolonged the downturn will be is uncertain. In the industrial countries, there are some signs that the rapid pace of decline in spending witnessed since the fourth quarter of 2008 has started to ease. But a strong, sustained recovery in those countries could be difficult given attempts by households and financial firms to repair their balance sheets. Nevertheless, substantial fiscal stimulus and exceptional monetary easing in many countries should help bring the recent contraction to an end. The policymakers task in the near term will be to ensure a sustained recovery. IN the medium term, however, it will be to ensure that policies are adjusted sufficiently to maintain the stability of long-term inflation expectations...[However] there is a significant risk that economic recovery in emerging markets will be delayed. In particular, there is a risk of a destabilizing negative feedback loop: the severity of the downturn could deter a recovery in capital flows to emerging markets, which could in turn further impair their growth. Economic recovery is also likely to require a rebound in international trade with reduced global imbalances; but bringing about the needed adjustments in both the emerging market and advanced economies could take time. In this setting, domestic

credit, whose resilience has supported economic activity in the emerging markets, could decline sharply....[In sum, it remains] an open question whether the expansionary set of policies enacted in response to the sharp contraction in economic activity in late 2008 and early 2009 will succeed in stabilizing the global economy. A major cause for concern is the limited progress in addressing the underlying problems in the financial sector. The experience in the Nordic countries in the 1990s and other historical episodes suggest that a precondition for a sustainable recovery is to force the banking system to take losses, dispose of non-performing assets, eliminate excess capacity, and rebuild its capital base. These conditions are not being met. A significant risk is therefore that the current stimulus will lead only to a temporary pickup in growth, followed by protracted stagnation.”

The June Financial Stability Review from the European Central Bank was also discouraging on this point: “The further significant deterioration of global macroeconomic conditions since the December 2008 Review as well as sizeable downward revisions to growth forecasts and expectations have added to the stresses on global and euro area financial systems. The contraction of economic activity and the diminished growth prospects have resulted in a further erosion of the market values of a broad range of assets. Connected with this, there has been a significant increase in the range of estimates of potential future write-downs and losses that banks will have to absorb before the credit cycle reaches a trough.” As Anatole Kaletsky recently pointed out in *The Times*, (“How the ECB’s Fig Leaf Has Completely Withered Away”, 29 June 2009), the ECB has actually pumped more money into the Eurozone financial system than the Federal Reserve has in the United States. Moreover, Kaletsky also notes that while the Fed has done this by purchasing securities, the ECB has loaned money to Eurozone banks, against lower quality collateral (e.g., commercial loans) than the U.S. Government securities the Fed has purchased from U.S. banks.

In terms of the broad macroeconomic situation, the latest OECD Outlook was as downbeat as the BIS and ECB. “The economic crisis will cast a long shadow...By the end of 2010, even though a recovery is projected to be underway, most OECD

countries will still face severe imbalances, including large output gaps [i.e., actual GDP growth below potential output], high unemployment, very low inflation or even deflation, and wide fiscal deficits...[Moreover], it is likely that potential output will be significantly reduced as a result of the crisis...Two thirds of this is due to the collapse in investment and the associated slower growth of capital input to production. This decline in capital intensity may continue over the medium term in response to an increase in capital costs associated with a permanent increase in risk aversion...The remaining fall in potential output is due to a rise in long-term structural unemployment...[Note, however] that these projected falls in potential output do no factor in effects from changes in labor force participation or changes in trend total factor productivity.”

Finally, the IMF paints a gloomy picture of the worsening fiscal situation faced by many governments. In “Fiscal Implications of the Global Economic and Financial Crisis”, it notes that while massive fiscal stimulus “is cushioning the global economy from the effects of the crisis, it implies a fiscal deterioration that is particularly strong for advanced economies, where the increase in both government debt and contingent liabilities [due to ageing populations] is unprecedented in scale and pervasiveness since the end of the Second World War....Both advanced and emerging countries face increased short and medium term fiscal risks, with key downside risks arising from the need for possible further support to the financial sector and the intensity and persistence of the output downturn...This somber fiscal outlook raises issues of fiscal solvency, and could eventually trigger adverse market reactions.” In the United States, the IMF’s warning was echoed by the most recent *Long Term Budget Outlook* from the Congressional Budget Office, which starkly noted that “slowing the growth rate of outlays for Medicare and Medicaid [two public sector health care programs] is the central long-term challenge for federal fiscal policy.” If no changes are made to current policy, CBO projects that these two programs alone would account for 10% of US GDP in 2035, and 17% of GDP by 2080.

What is striking, however, is the completely opposite conclusion you would reach about the world outlook if you just looked at what happened in the U.S. financial

sector over the past month. We saw the issuance of new equity, repayment of some TARP funds, the effective collapse of the Public Private Investment Program to get “toxic” (now called “legacy”) securities and loans off the banks’ balance sheets, the growing realization that the Obama administration’s proposed regulatory reforms will likely end up having much more bark than bite, Citicorp brazenly raising interest rates on outstanding credit card balance before new legislation comes into force that would prevent it from doing this, and there were widespread stories about record profits (thanks to government funding guarantees and diminished competition) and record bonus accruals at major investment banking firms – none of which, unlike GM, have been forced to fire their CEOs. You could easily be forgiven for thinking that, at least on Wall Street, the theme of the month was “Happy Days are Here Again.”

Of course, you would also have had to overlook some rather more worrying news. There were more indications of rapidly worsening credit quality, with credit card and mortgage delinquencies sharply up (and that is before a wave of adjustable rate mortgage interest rate resets and payment schedule recasts that are due to occur over the next three years), \$430 billion in loans to highly leveraged buyouts coming due between 2012 and 2014, rapidly worsening conditions in commercial real estate loans, and FDIC bank seizures (which are what happens in the U.S. when a bank that is not “too big to fail” goes bust) on pace for a record year, in large part due to rapidly souring construction and development loans. From our perspective, it would appear that even as debt deflation is accelerating (if still largely off most investors’ radar screen), the banks are doing their best to reinforce future political opposition to bailing them out when their situation once again deteriorates. This does not bode well for the future.

Nor does it likely bode well for the Obama administration’s relationship with the U.S. middle class. In particular, four pieces of information caught our eye in June. The first was a new paper, “The American Consumer: Reforming or Just Resting?” by Carroll and Slackalek. They directly take on the still apparently widespread belief that the current downturn is a temporary aberration, after which “things will return to normal.” The authors present evidence that disproves this rosy view, and show

instead that the more likely outcome is a prolonged drop in consumption spending and rise in household saving. Closely related to this was a second interesting article, “Spent: America After Consumerism” by Amitai Etzioni, that appeared in *The New Republic*. It was an interesting piece by a Democratic professor who was clearly struggling with the issue of “what comes next?” for the American middle class. Etzioni offers greater community involvement and/or an increased focus on “transcendental pursuits” (which, in the fine print, includes traditional religion). The author senses that economic change is driving social change, but he’s not quite sure where it is headed.

The third interesting piece of information was a new report by the Chief Marketing Officer’s Council (“Losing Loyalty, The Consumer Defection Dilemma”). They “studied 34 million U.S. shoppers’ purchasing patterns for two-years across 685 leading consumer packaged goods brands and 24,000 retail stores,” and found that an “astounding one-third of the average consumer packaged goods brand’s most loyal US consumers defected from the brand between 2007 and 2008, and many more reduced share of category spend with the brand. For the average brand, only 48 percent of highly loyal consumers in 2007 [who normally make 70% of category purchases in a single brand] remained highly loyal in 2008, and 33 percent of these highly loyal consumers completely stopped buying the brand even while they continued to make purchases in the same product category.” In a nation where “aspirational” marketing of brands as status symbols had been highly successful, this is stark evidence of the extent to which the U.S. middle class has been pushed to the wall. The fourth interesting study found that an increasing number of consumers aren’t willing to take it any more. In “Moral and Social Constraints to Strategic Default on Mortgages”, Guiso, Sapienza and Zingales study “American households’ propensity to default when the value of their mortgage exceeds the value of their house, even if they can afford to pay their mortgage (i.e., so-called ‘strategic default’).” The authors find that “26% of recent defaults are strategic”, and that “17% of households would strategically default when their equity shortfall reaches 50% of the value of their house.” In addition, “people who know someone who defaulted are 82% more likely to declare their intention to do so”, and “the willingness to default increases non-linearly

with the proportion of foreclosures in the same ZIP code.” With rapidly rising unemployment causing mortgage arrears and defaults to rapidly increase even for the “safest” categories of borrower, no viable mortgage relief plan in sight from the Obama administration, and Wall Street rather publicly converting taxpayer financed bailouts into huge bonus pools, we strongly suspect this middle class rebellion will gain much more traction in the months ahead, with predictably negative consequences for the world financial system.

If the outlook has dimmed for an early resolution of the household leverage or banking system solvency problems, have events over the past month provided any more cause for hope about the need to rectify unsustainable structural imbalances in the world economy (essentially by getting Chinese consumers to spend and import more while their U.S. peers increase their savings and exports)? Unfortunately, here again developments have not been favorable. Last month’s hopeful storyline about rising Chinese growth driving higher levels of commodity imports has given way to a more accurate and unsettling view. Apparently, a significant portion of the substantial increase in bank lending in China has been used to purchase commodities, equities and property. Depending on your point of view, this constitutes either speculation or prudent risk diversification by the people involved – after all, buying commodities and property may well be a safer bet than adding further capacity to a factory when export markets are in sharp decline. To be sure, the aggressive expansion of lending by Chinese state banks, as well as increased infrastructure spending has undoubtedly boosted Chinese growth somewhat. However, too much of that growth appears to be taking the form of adding capacity to state owned enterprises that don’t need it, in order to keep workers employed. Thus far, Chinese private sector investment has shown much less expansion, domestic consumption growth is happening only slowly (as Central Bank Governor Zhou Xiaochuan noted on 3 July, increasing private consumption “is easier said than done”), and a “buy China” policy (as well as China’s undervalued exchange rate) has severely limited growth in imports, which would translate into higher export growth for other countries (indeed, Japan’s exports, which in the past have been driven by growth in China, continued to plunge in June). We

were also struck by a survey released in June by the Chinese central bank, which found the percentage of households that were “comfortable” with their incomes was the lowest in ten years. It is probably no coincidence that China also seems to have launched another anti-corruption drive, in an attempt to avoid social unrest by deflecting the attention of the peasantry and coastal middle classes from the economic situation to one where the Party’s actions are likely to be more popular.

Perhaps the biggest story of the past month was the rapidly changing situation in Iran. What began as a stage managed election pitting one faction of the ruling regime against another rapidly evolved into a more fundamental challenge its future, with potential ramifications throughout the Middle East. The original contest was between current President Mahmoud Ahmadinejad and a number of challengers, out of which Mir Hossein Mousavi emerged as the leading candidate. Mousavi had been prime minister of Iran during the period of the Iran-Iraq War (1981-1989), during which time he frequently clashed with Ali Khamenei, then president of Iran, who became the country’s supreme leader after Ruhollah Khomeini’s death in 1989. Ahmadinejad is a former member of the Iranian Revolutionary Guards, which since the Iraq war has been the nation’s primary military force and also, similar to the PLA in China, an organization with multiple economic interests. The 2009 election had been described by some as a contest between Ahmadinejad, Khamenei, IRG, and the populist Basij militia against the older religious authorities (the so-called mulloahs of Qom) and the political faction led by former president Ali Rafsanjani. Ahmadinejad ran a populist campaign that garnered support from the nation’s poor, while Mousavi initially drew his support from the middle class who was more concerned about the substantial economic deterioration that had occurred during Ahmadinejad’s first term. However, during the later stages of the campaign, something fundamental seemed to change, perhaps because Mousavi’s wife’s prominent role in his campaign and Ahmadinejad’s attacks on her. Iranian youth of both genders mobilized publicly in great numbers to support the Mousavi campaign, causing an intra-elite contest to evolve into a more dangerous challenge to the regime. This movement gained much more support following the inexplicably heavy handed manipulation of the election returns to deliver

an implausible landslide victory to Ahmadinejad. This triggered widespread street protests, which were met by condemnations by supreme leader Khamenei and increasingly violent repression of the protests by the Basij militia and the IRGC. International opinion shifted quickly to the protesters' side when graphic images of violence against them (such as the shooting of Neda Soltan) became widely available on the internet. This also forced many western governments, including the Obama administration, to take a more forceful stance against the actions of the Ahmadinejad regime. Most recently, allies of Khamenei have called for the execution of protesters and accused Mousavi of being a foreign agent, while the association of clerics in the holy city of Qom have come out in support of Mousavi's call for a new election and against the violent repression of the protests. At this point, the future evolution of events remains highly uncertain. In one scenario, the Revolutionary Guards effectively stage a coup in support of Khamenei and Ahmadinejad. This would likely lead to a prolonged period of internal instability (as the regime's perceived illegitimacy would be even higher than it is now) and quite possibly more aggressive international actions by the regime as it attempted to deflect public opinion towards Iranian nationalism. Bottom line: at this point, the continuation of the Ahmadinejad regime seems likely to increase the probability of our conflict scenario developing. In an alternative Iranian scenario, splits within the IRG, or the prospect of a bloody conflict with police and other Iranian armed forces, along with renewed mass protests (and perhaps general strikes) would lead to the replacement of the Ahmadinejad/Khamenei coalition by a Mousavi/Rafsanjani coalition. What is not clear at this point is the extent to which the policies of a Mousavi administration would differ from those of the Ahmadinejad regime. However, it seems likely that the broad upswelling of popular support, particularly among the large number of Iranian youth, might lead to a more moderate approach, and thus an increase in the probability our cooperative scenario will develop (for more on this, see "Why Iran's Changed Forever" by Reuel March Gerech in the 24 June 2009 edition of *The Weekly Standard*).

Finally, in light of several recent developments, this month we are also updating the influenza warning indicators that we first published in April. As you can see,

developments in this area are progressing in a direction that raises the probability of a sharp increase in uncertainty at some point in the next twelve months.

| <i>Warning Indicator</i> | <i>Latest Developments</i> |
|---|---|
| <ul style="list-style-type: none"> • Reports that the H1N1 swine flu affects other organs – e.g., that it is neurotropic, or that it affects the digestive tract, liver or kidneys. | <ul style="list-style-type: none"> • Some reports of vomiting and diarrhea in a significant proportion of cases. • Studies have found no evidence that H1N1 Swine is neurotropic, or that it affects the liver or kidneys. |
| <ul style="list-style-type: none"> • Any reports of co-infection (e.g., in swine) with Mexican H5N2 poultry influenza, which was associated with heart, pancreas and kidney tropism. Similarly, we are looking for any reports of Mexican swine H1N1 reaching Indonesia or Egypt, where H5N1 infections in poultry (and possibly other animals) have reached high levels. The analogy we have in mind is 1918, when the initial mild wave of flu infections was soon followed by a subsequent wave of much more serious infections (which could have been caused by reassortment or recombination with more dangerous strains of the influenza virus). | <ul style="list-style-type: none"> • In the last two months, H1N1 infections have been reported in Egypt and Indonesia, though as yet there is no evidence from either of these countries of more severe influenza infections that are more easily transmitted between humans. • Indication that H1N1 is developing resistance to Tamiflu, a popular antiviral drug often used to treat it. Note that over the last year, Tamiflu resistance has become widespread in seasonal influenza. |
| <ul style="list-style-type: none"> • Reports that H1N1 Swine is associated with viral pneumonia, and cases of severe inflammation (which produce so-called “cytokine storms”, in which inflammation sets off a positive feedback loop, sending the body’s immune system into overdrive, and filling the lungs with white blood cells and other fluids). This may be associated with an unusually high death rate for 19 – 64 year olds, relative to the death rates for younger and older infected patients | <ul style="list-style-type: none"> • Reports that H1N1 causes more severe respiratory tract infections than seasonal influenza. • Some reports (e.g., from Argentina, Thailand, New York and California) of rapid patient deterioration and cyanosis (blue discoloration of skin due to poor oxygen level in blood) that is consistent with a cytokine storm reaction. • Higher death rates reported for 19 – 64 year olds. |
| <ul style="list-style-type: none"> • Reports that the virus is characterized by unusually high | <ul style="list-style-type: none"> • Reports indicate that H1N1 Swine has somewhat higher replication |

| Warning Indicator | Latest Developments |
|--|---|
| replication rates in a host. | rates than seasonal influenza (see “Pathogenesis and Transmission of Swine-Origin 2009 A(H1N1) Influenza Virus in Ferrets” by Munster, de Wit, van den Brand, et al (<i>Science Express</i> 2 July 2009)) |
| <ul style="list-style-type: none"> • Rising rates of hospitalizations – above 1 – 2% of infected patients. | <ul style="list-style-type: none"> • In the worst outbreak to date, hospitalizations are rapidly rising in Argentina. However, due to poor tracking of actual infection rates, it is hard to accurately calculate hospitalization rates. |
| <ul style="list-style-type: none"> • Reports of more than 10% of those hospitalized with H1N1 swine flu dying from the disease. | <ul style="list-style-type: none"> • With 1,587 confirmed cases and 44 deaths, the 2.8% mortality rate in Argentina has been unusually high. |

So what does last month’s data mean for investors and their asset allocations? We use the following table to provide insight into the weight of market views about which of three regimes – high uncertainty, high inflation, or normal growth – is developing. The asset classes we list under each regime should deliver relatively high returns when that regime develops. We assume that the rolling three month return on these asset classes is a useful indicator of the market’s conventional wisdom about the regime that is most likely to develop within the next twelve months.

| Rolling Three Month Returns in USD | | | 30-Jun-09 |
|--|---|--|-----------|
| <i>High Uncertainty</i> | <i>High Inflation</i> | <i>Normal Growth</i> | |
| Short Maturity US Govt Bonds (SHY) -0.20% | US Real Return Bonds (TIP) 0.35% | US Equity (VTI) 16.90% | |
| 1 - 3 Year International Treasury Bonds (ISHG) 0.02% | Long Commodities (DJP) 12.38% | EAFE Equity (EFA) 24.38% | |
| Equity Volatility (VIX) 10.35% | Global Commercial Property (RWO) 32.25% | Emerging Equity (EEM) 30.90% | |
| Gold (GLD) 1.00% | Long Maturity Nominal Treasury Bonds (TLT)* -9.68% | High Yield Bonds (HYG) 20.68% | |
| Average 2.79% Last Month: 3.65% | Average (with TLT short) 13.66% Last Month: 17.76% | Average 23.22% Last Month: 34.72% | |

* falling returns on TLT indicate rising inflation expectations

As you can see, the conventional wisdom still seems to favor a relatively quick return to normal times (though with an undercurrent of worry about higher inflation). However, based on our analysis, we conclude that these expectations are quite likely wrong. If anything, it seems to us that the probability of a return to higher uncertainty (and stronger deflation) has risen again over the past month. Hence, we believe the risk of “normal regime” assets being overvalued has increased, as has the probability that “uncertainty regime” assets are undervalued.

The following table summarizes the accumulated evidence over the past three months (on a rolling basis) against both of our scenarios in the following table. More specifically, we report evidence that seems significantly more likely to be observed if a scenario is false than if it is true. This is in the spirit of the scientific method, where one tries not to *prove* hypotheses, but to *disprove* them. This approach also helps to

minimize the risk that our conclusions will be skewed by the confirmation bias, of the tendency to only look for, and give relatively heavier weight to evidence which confirms one's existing views. We do not claim that this approach is foolproof, nor that it guarantees perfect objectivity and foresight. However, evidence from the use of this approach in the intelligence community suggests that it does help to improve forecast accuracy.

| | Cooperative Scenario | Conflict Scenario |
|--|---|---|
| <i>Brief Scenario Description:</i> | More rapid domestic consumption growth in China and cleantech investment demand in North America return the world to a health rate of growth, and enable preservation of the world trading system, a reduction in global imbalances, and monetary actions to head off an extended period of high inflation. | Domestic politics prevents an increase in cleantech investment in the United States, while China continues to pursue export led growth while encouraging rising nationalism to limit domestic unrest and the political threat to the current Chinese leadership. This only reinforces growing demands for protection in Europe and the United States. Weak global demand is maintained by rising fiscal deficits, which are increasingly monetized, leading to much higher inflation. |
| <i>Key Agent Level Scenario Assumptions</i> | | |
| U.S. Middle Class | Resolution of banking crisis, passage of health care reforms, mortgage relief, and a sharp increase in cleantech driven investment spending lead to reduced uncertainty and a shift towards higher savings and lower consumption, | Continued economic stagnation, uncertainty, and insecurity lead to more extreme partisanship and the development of strong populist calls for protectionism and income redistribution. |

| | Cooperative Scenario | Conflict Scenario |
|-------------------------|--|--|
| | without triggering populist demands for protectionism. | |
| Chinese Peasants | Land reform and economic growth (which provides jobs) boost incomes while a sharp increase in government spending on health care and education limits resentment of Communist Party corruption and economic inequality compared to coastal elites. This minimizes social unrest and threats to continued legitimacy of the Party's governance of China. | Growing unemployment and a sense that government stimulus is disproportionately benefiting coastal and party elites triggers widespread unrest and peasant alignment with disaffected students, urban unemployed, and members of the military. The Chinese government becomes aggressively nationalist in an attempt to channel this anger outward. At best, this triggers a global retreat into trading blocs; at worst, this strategy fails and China descends into fragmented authoritarian regions with minimal central control. |
| Iranian Youth | Prolonged economic stagnation and rising inflation lead to the defeat of President Ahmadinejad in June 2009 elections, and widespread pressure for better relations with the West. Economic self-interest trumps the Revolutionary Guards' ideological opposition to this opening. Moderation of Iran's conflicts with the west and a renewal of inward investment flows lead to increased hydrocarbon production, limiting upward pressure on global energy prices. | Supreme Leader Khamenei ensures that Ahmadinejad is re-elected. Repression and emigration are used to limit resistance by younger Iranians to these policies. The country attempts to improve economic conditions via closer ties with China, while maintaining its nuclear program (which could trigger an attack by Israel) and a conflict-oriented policy versus the US that continues to put upward pressure on energy prices. |

| | Cooperative Scenario | Conflict Scenario |
|---|--|--|
| <i>Key Issue Level Scenario Assumptions:</i> | | |
| Overleveraged Consumers | Effective mortgage relief plans implemented in most affected countries, while stronger economic growth maintains income needed for debt repayment. | No effective mortgage relief legislation passed. Instead, rise in bankruptcies and mortgage foreclosures puts continuing downward pressure on housing prices. |
| Financial System Weakness | Combination of stronger investment and export led economic growth and effective bank rescue plans reduces uncertainty about health of system, and enables sufficient flow of credit to support renewed economic growth. | Worsening economic conditions and failure of bank rescue plans (due to design or political resistance) cause uncertainty to remain high, credit flows to be constrained, and defaults to increase, which all contribute to a worsening process of debt deflation. |
| International Imbalances | Rising domestic consumption spending in China enables a reduction in export dependence, while U.S. imports are reduced by a shift from private consumption to private saving and higher investment spending and greater exports. This reduces global current account imbalances to a manageable level. | China's continued emphasis on export led growth, at a time when the US is incurring high fiscal deficits (and eventually higher taxes) to maintain global demand, triggers demands for greater protection, which in turn precipitate a dollar exchange rate crisis as other countries move to limit the losses on their foreign exchange reserves. Result is a fragmentation of the global trade and financial system into much less integrated blocs. |
| <i>Evidence Over the Previous Three Months Against Each Scenario (most recent month first)</i> | <i>Evidence Against the Cooperative Scenario</i> | <i>Evidence Against the Conflict Scenario</i> |
| June 2009 (This Month's | <ul style="list-style-type: none"> Continued evidence of | <ul style="list-style-type: none"> Rapidly developing |

| | Cooperative Scenario | Conflict Scenario |
|---------------|--|---|
| Issue) | <p>worsening quality of a wide range of loans and securities, including credit cards, residential and commercial mortgages, construction and development, and LBOs.</p> <ul style="list-style-type: none"> • Rising FDIC seizures of banks that are not “too big to fail” • Apparent failure of PPIP program to gain traction, as some banks raised new equity and repay TARP funds • Banks have successfully fought off tougher regulation, have raised rates on credit cards, and have let slip that profits and bonus accruals are at record levels • California budget deadlock and issuance of IOUs could heighten foreign creditor fears about creditworthiness of U.S. Government. CBO report highlights need to contain health care costs in order to maintain public sector’s fiscal health. • Evidence that Chinese growth may be weaker than previously thought, and that commodity price increase has been driven by speculative buying rather than | <p>events in Iran may lead to more moderate regime. However, this remains highly uncertain at this point.</p> |

| | Cooperative Scenario | Conflict Scenario |
|--|---|--------------------------|
| | <p>industrial demand</p> <ul style="list-style-type: none"> • Both UK and Japanese economy show sharpest drops in 50 years • China imposes a “buy China” policy on use of its stimulus funds; WTO warns of rising protectionism as unemployment mounts in countries around the world • Record support by European Central Bank to regional banks – surpassing amount of support provided by U.S. Federal Reserve • Germany introduces national balanced budget amendment, which if enacted will prevent countercyclical fiscal action by Eurozone’s largest economy • World Bank warns of declining flow of capital to emerging markets, which will constrain their growth, and possibly trigger more crises • Rising opposition in US Congress to both energy bill (Senate passage remains uncertain) and health care reform • Chinese central bank survey indicates rise in dissatisfaction with | |

| | Cooperative Scenario | Conflict Scenario |
|-----------------|---|--|
| | <p>household income; government increases crackdown on public corruption (hoping to distract rising social unrest?)</p> <ul style="list-style-type: none"> • Rising number of indications that Swine H1N1 influenza is evolving in a potentially dangerous direction | |
| May 2009 | <ul style="list-style-type: none"> • US Congress has sharply reduced renewable energy requirements proposed by Obama administration, and chose to auction only 15% of CO2 emissions permits, rather than 100%. This has opened an even wider gap in the Obama budget deficit forecast, and raised worries about significant increases in inflation. This has led to an increase in long term interest rates and commodity prices. All of these factors create headwinds for the conversion of the enormous government fiscal and monetary stimulus into a sustained recovery. • Continued worsening of unemployment and problems in the mortgage, housing and household credit markets, with problems | <ul style="list-style-type: none"> • Signs that credit market conditions are returning towards, if not to, normal. • Low enthusiasm for PPIP, and stated desire on the part of some banks to repay TARP funds, implies they believe they can “earn their way out of the crisis” via the large gap between the yields on the Treasuries they hold and their low government guaranteed funding costs. • During his trip to China, Secretary Geithner and his Chinese hosts have made conciliatory statements to each other, backing away from some of the more inflammatory rhetoric seen in the past few months. • Strong win by Congress Party in Indian elections should lead to faster |

| | Cooperative Scenario | Conflict Scenario |
|-------------------------------|--|--|
| | <p>moving into ever higher levels of the middle class. This is not only creating more headwinds for economic recovery, but also strengthening an explosive populist anger whose eventual impact is unclear, but unlikely to be positive.</p> <ul style="list-style-type: none"> • It appears that interest groups are gaining ground in their plans to block or weaken significant parts of the Obama economic program • Introduction of protectionist legislation in US Congress aimed at China • Weakening of Chinese export demand in April; surprise announcement that 25% of stimulus program will be directed to Sichuan suggest domestic conditions may be worsening in China • Worsening growth in Japan and Europe raises the risk of political unrest and a new banking crisis • In Iran, Khamenei seems to have switched support to Ahmadinejad in the 12 June presidential election | <p>reform and GDP growth</p> |
| April 2009 (May Issue) | <ul style="list-style-type: none"> • Aggressive speeches by Chinese officials at Boao Forum meeting of Asian | <ul style="list-style-type: none"> • Increased probability that China may aggressively push |

| | Cooperative Scenario | Conflict Scenario |
|--|--|--|
| | <p>nations, demanding US protect Chinese holdings of Treasury bonds against inflation, and that Asian nation’s organize to negotiate with commodity suppliers.. Another speech acknowledged that increase in domestic consumption demand would take time to realize</p> <ul style="list-style-type: none"> • Declining power and oil consumption in China • Failure to pass legislation to ease mortgage debt burden in United States • Environmental and energy legislation that is key to higher investment in cleantech is stalled in US Congress • Obama administration actions in Chrysler bankruptcy increase uncertainties facing creditors • Wall Street bonus accruals in first quarter back at high levels, and no executive firings a la Rick Wagoner at GM. • Polling data indicates widening gap between elite’s view of current situation (improving) and view of middle class (worsening) | <p>cleantech, both domestically and in export markets</p> <ul style="list-style-type: none"> • New conservative enters presidential race in Iran, saying Ahmadinejad has pushed nation to “precipice.” • US Stress Test results have clarified strategy for rescuing financial system • Obama Georgetown University speech presented a coherent overview of economic strategy |

| | Cooperative Scenario | Conflict Scenario |
|--|---|--------------------------|
| | <ul style="list-style-type: none"> Evidence that the chance of an extended period of deflation has increased | |

Feature Article: The Outlook for Venture Capital Returns

Across a range of media, recent months have seen a growing number of stories claiming that the venture capital industry is broken, and no longer delivers attractive risk adjusted returns to investors. This article will examine three interrelated issues: (1) Is the venture capital industry truly broken? (2) If so, what accounts for this? (3) What are the prospects for future returns from venture capital investing?

At the core of the argument that venture capital is broken lies the declining average returns (net of management fees and carried interests) that the industry has provided to investors in venture capital limited partnerships. The following chart shows the annualized returns to LPs on early and late stage U.S. venture funds over the 3 and 10 years ended on 31 December 2008. The underlying data comes from the National Venture Capital Association. We have also included the return on the Russell 2000 Index as a benchmark for the returns on publicly traded small companies (which are still larger than the companies in which VCs invest).

| <i>Investment</i> | <i>3 Year Average Return</i> | <i>10 Year Average Return</i> |
|--|------------------------------|-------------------------------|
| Early Stage Venture | 1.7% | 36.0% |
| Late Stage Venture | 9.5% | 7.5% |
| All Venture | 4.2% | 15.5% |
| Russell 2000¹ | (6.1%) | 1.7% |
| All Venture – R2000 | 10.3% | 13.8% |
| Comparable return on U.S. Treasury Security² | 4.4% | 4.7% |
| Ex-Post Venture Premium Over Treasuries | (.2%) | 10.8% |

¹For 3 years, we use the IWM ETF. For 10 years, we use the index less 20 basis points to make it comparable to the ETF.

²The yield to maturity on a 3 year Treasury note bought on 12/30/05 and a 10 year note bought on 12/31/98.

The key question is whether 13.8% (which includes the impact of the 1999 and 2000 technology bubble) or 10.3% is an adequate additional return to compensate investors for two additional sources of risk and uncertainty they would not face if they simply invested in the still small, but more mature public companies that are included in the Russell 2000 index. The first is additional business risk, related to the development of new markets, value propositions (and the new technologies that often underlie them) and business models (to deliver them at a profit). So how much additional return should an investor require for bearing this additional business risk? One benchmark is John Cochrane's study, "The Risk and Return of Venture Capital". He found that the returns on individual venture backed companies were, on average, about six times as volatile as the returns on a broad public equity market index. However, to some extent this individual risk should be reduced by the impact of having a somewhat diversified mix of these companies in the portfolio of a venture capital partnership. So let's assume that the average returns earned by an individual LP are four times as volatile. Finally, investors in venture capital funds typically hold interests in more than one venture LP. So let's assume that this cuts risk again, and makes it just twice as volatile as the returns on the public equity market. If we assume the required return premium for the broad public equity market is between 2.5% and 4.0%, then the required premium to invest in venture capital funds as an asset class would be between 5.0% and 8.0%. And as you can see, this is a conservative estimate – it could easily be higher.

However, in addition to higher business risk, investors in venture capital funds also face illiquidity risk, since limited partners usually must commit their funds for ten years. Moreover, the secondary market for shares in venture capital limited partnerships is very thin, and any trades that occur usually take time and are closed at a deep discount. The additional compensation that an investor should require for bearing this illiquidity risk is very much an issue in flux. In the past, some estimates put it as low as 1.5% per year (see, for example, "The Liquidity Risk Premium in Corporate Bond Markets" by DeJung and Driessen, or "A Simple Model for The

Expected Premium for Hedge Fund Lockups” by Emanuel Derman). More recently, Chen and Ibbotson (in “The Liquidity Premium”) looked at returns on publicly traded equities between 1972 and 2008. They did a two way sort on their sample, based on quartiles of liquidity and size, as measured by market capitalization. In the case of the smallest stocks, the average annual return difference between those with the highest and lowest liquidity was 13.3%. For the next three liquidity quartile, the return differences were 11.6%, 6.7%, and 3.4%. As we have noted in the past, this type of analysis likely picks up other causal factors (which are all related), including the differing availability of information and the presence of momentum investors. Finally, it also seems likely that after the events of the past two years – in which many asset class correlations moved towards 1.0 as prices declines, and bid/ask spreads dramatically widened – have increased the average premium that investors will demand in exchange for accepting a high level of illiquidity. So for the purpose of this analysis, we will assume that investors in venture capital LPs will also require an annual liquidity premium of 5.0%.

So, we now have a required VC equity risk premium of between 5% and 8%, and an additional liquidity premium of 5%, for an all-in required return premium of between 10% and 13% over the return on U.S. Treasury securities (whether expressed in nominal or real terms). On this basis, the return that investors in venture capital partnerships have actually earned seems inadequate, particularly in recent years. However, that begs the question of whether this means the venture capital industry is “broken”, as so many commentators have recently claimed. Broadly speaking, there are two schools of thought on this issue. One sees a cyclical problem, and the other sees a more worrisome structural change.

To understand the difference between these views, it will help to have a basic understanding of the drivers of returns on an investment made by a venture capital fund. Typically, these are stated as multiples of the amount of money invested in a company – e.g., “our exit multiple was 5x.” Taking a step backwards, the price the venture capital partnership receives when it sells a company in which it invested is a function of four variables: the company’s sales, its cash flow margin (frequently

expressed as the ratio of earnings before interest, taxes, depreciation and amortization to sales), the valuation multiple put on the company by the market (frequently expressed as Enterprise Value/EBITDA) and the extent to which debt has been added to the company's capital structure to boost the returns to shareholders (expressed as the ratio of the market value of equity to Enterprise Value). The exit multiple can therefore be expressed as: $\text{Exit Multiple} = (\text{Sales} \times \text{EBITDA} / \text{Sales} \times \text{Enterprise Value} / \text{EBITDA} \times \text{Equity} / \text{Enterprise Value}) / \text{Original Equity Investment}$. Looked at another way, the exit multiple reflects decisions related to growth (i.e., markets targeted, and the relative attractiveness of a company's offering to potential customers), operations (how efficiently the company delivers its offering), and finance (how much leverage it uses), as well as changes in investor perceptions that are largely beyond the company's control.

The actual returns a venture partnership realize on an investment are related not only to the multiple at which it is sold, but also to how long it takes to accomplish that, as can be seen in the following table:

Realized Internal Rate of Return

| 100 | Years to Exit | | | | | | | | | |
|---------------|---------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Exit Multiple | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 0 | -100% | -100% | -100% | -100% | -100% | -100% | -100% | -100% | -100% | -100% |
| 1 | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| 2 | 100% | 41% | 26% | 19% | 15% | 12% | 10% | 9% | 8% | 7% |
| 3 | 200% | 73% | 44% | 32% | 25% | 20% | 17% | 15% | 13% | 12% |
| 4 | 300% | 100% | 59% | 41% | 32% | 26% | 22% | 19% | 17% | 15% |
| 5 | 400% | 124% | 71% | 50% | 38% | 31% | 26% | 22% | 20% | 17% |
| 6 | 500% | 145% | 82% | 57% | 43% | 35% | 29% | 25% | 22% | 20% |
| 7 | 600% | 165% | 91% | 63% | 48% | 38% | 32% | 28% | 24% | 21% |
| 8 | 700% | 183% | 100% | 68% | 52% | 41% | 35% | 30% | 26% | 23% |
| 9 | 800% | 200% | 108% | 73% | 55% | 44% | 37% | 32% | 28% | 25% |
| 10 | 900% | 216% | 115% | 78% | 58% | 47% | 39% | 33% | 29% | 26% |

As you can see, higher exit multiples earned more quickly generate higher returns for venture capital partnerships. However, not all the investments made by the venture capital partnership are successful. Typically (for an early stage firm), 33% generate

significant returns, 34% modest returns, and 33% are write offs. The following simple example, will make clear the economic consequences of this “batting average” or “hit rate” factor.

Assume our venture capital partnership raises \$100 million from a single investor (the LP), who pays a 2% annual management fee to the general partner (i.e., the VC with his or her name on the door). The investor seeks a return of at least 16.5% (3.5% ten year Treasury yield plus 8% business risk and 5% liquidity risk premiums). Assume also that the general partner retains 20% of all profits after the original \$100 million has been returned to the investor. Assume that the venture capital partnership draws down the funds over the first three years (\$25m, \$50m, \$25m) and makes ten investments of \$10 million each. Finally, assume that the exit years and multiples of the six investments that aren't written off are as follows (with IRRs from the above chart listed below the multiples):

| Yr 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|------|---|---|---|-----|-----|-----|-----|----|----|
| | | | | 7x | 7x | 5x | 3x | 2x | 2x |
| | | | | 48% | 38% | 26% | 15% | 8% | 7% |

In this case, the additional cash flow the investor receives after return of the original \$100 million investment is \$108 million – about a 2x cash-on-cash return over ten years. Taking the timing of those cash flows into account, the investor's actual IRR is 17.2%. Finally, and not insignificantly, the net cash flows to the venture capital general partner (from management fees and the 20% carry) are \$52 million (from which he or she pays office expenses, salaries, and bonuses). Whether the VC's compensation is reasonable in light of the actual returns earned by the LP investor is an issue about which people can, and increasingly do, disagree.

Let us now return to the discussion of whether the low recent returns to LPs on their venture capital investments principally reflect cyclical or structural factors. The cyclical argument goes like this: opportunities to earn the high returns demanded by investors in venture capital partnerships go in cycles, to which the supply of investable funds responds with a lag, and often overshoots. The result of this is a cycle of returns, in which a rise in opportunities initially enables VCs to drive a hard bargain

(e.g., a low price for a given ownership share of the company) with entrepreneurs seeking funds, which generates high returns for LP investors. These returns trigger a flood of new money into venture capital partnerships at the very time that the original new investment opportunity is maturing (i.e., technology maturing, customers becoming more sophisticated, competition increasing, business risk and potential returns declining, etc.). The result is “too much money chasing deals” which enables entrepreneurs to drive hard bargains with the VCs, who subsequently achieve fewer successful exits (via IPO or acquisition) and generate lower returns for the LPs. The latter then reduce their commitment to venture capital, which, assuming the arrival of new entrepreneurial opportunities, sets the cycle in motion again.

A number of writers have presented evidence in support of the cyclical view of the problems in venture capital. In his excellent paper “Right Sizing the Venture Capital Industry”, Paul Kedrosky notes that “for most of the 1980s, venture investing was under .1% of GDP, falling as low as .04% in 1991 before rising above .1% in 1995, and reaching its all time high of 1.1% in 2000. After falling to a post-internet boom low of .16%, it has risen again to .19%.” Kedrosky expects LPs to shrink their commitment to venture investing by up to 50%. As he noted, “the five-fold increase in venture capital commitments by limited partners [triggered by the technology boom] led to a collapse in performance from which the [venture capital] sector has never recovered.” Data from the National Venture Capital Association indicates that this is already happening. In 2003, aggregate commitments to 919 venture capital funds totaled \$257 billion; by 2008, this had fallen to \$197 billion in commitments to 882 funds.

The argument that venture capital’s problems are structural rests on critical changes underway in four areas: (1) the supply of new opportunities; (2) entrepreneurs’ demand for venture capitalists’ offering; (3) changes in the nature of that offering and/or the VC partnerships’ capabilities; and (4) changes in the nature of exit markets for VC-backed companies. We will look at each in turn.

Let’s start with a description of what makes an opportunity attractive to a venture investor. In our experience, there are some common elements, which

correspond to the value creation drivers noted above. Attractive opportunities have high growth potential, which is often indicated by the existence of large numbers of potential customers who have an increasingly painful problem and the budget to pay for solutions. Attractive opportunities also have a company with a substantially better solution to that problem, which can be delivered at a healthy margin, based on a business model that is hard for competitors to duplicate. Attractive opportunities can be quickly scaled up to attractive exit multiples within five to seven years. Attractive opportunities are also easy to explain to potential buyers (think back to maximizing the Enterprise Value/EBITDA ratio) and lenders (think back to minimizing Equity/Enterprise Value). Attractive opportunities are not too capital intensive (i.e., they don't take up too large a share of a venture fund's assets), but still require sufficient capital that entrepreneurs will need the VC's services. And attractive opportunities have experienced managers in place who have a good chance of avoiding the many pitfalls that accompany rapid growth. When you look back at the late 1990s (which I still can't quite believe was more than a decade ago), you can see how all these elements were in place in the case of the telecommunications, media, and technology boom. However, more recently some of those conditions have changed – the industry has become less capital intensive, and copying has become much easier (just look at the profusion of social networking companies). Yet 50% of venture capital investments are still going into the TMT space. We don't see why the argument in the hedge fund world about crowded strategies delivering lower returns shouldn't also apply to venture capital investing.

It is also clear that biotechnology runs into some challenges against these attractiveness criteria, including the number of customers with the problem you are trying to solve (many biotech companies are focused on niches), their budget for paying for solutions (in a world that is trying to contain exploding healthcare costs), and the time to scale up to attractive exit multiples (e.g., due to the pace of scientific development and clinical testing).

However, biotech still looks more attractive as a venture investment than a significant portion of that great space collectively called "cleantech". The size of this

opportunity is heavily dependent on the willingness of politicians to impose explicit costs on greenhouse gas emissions. One of the biggest markets for cleantech solutions is also notorious for its weak legal protection of intellectual property rights, and ability to rapidly copy promising technologies and offer them to customers at much lower prices. In the energy industry, customers' (e.g., electric utilities) typically take a long time to adopt and deploy new technologies. In many cases, capital requirements are far bigger than the resources available to venture capital funds, at a time when credit is scarce. And many managers may find that the skills developed while scaling up an I.T. business do not lead to expertise in scaling up capital intensive energy businesses. Similar arguments have been made about the characteristics of the new entrepreneurial opportunities related to the radical restructuring of healthcare systems around the world that must occur if governments are to avoid future fiscal disaster. In sum, the first argument for structural problems in venture capital is that today's entrepreneurial opportunities are ill-matched to the current venture capital business model.

The second argument for structural problems in VC focuses on entrepreneurs' apparently low, and possibly declining, demand for the services provided by venture capital partnerships. Kedrosky presents some damning data: "We studied the prevalence of venture capital financing among companies on the Inc. 500 list of the fastest growing private companies in the United States. Looking across ten years of that list – roughly 900 unique companies from 1997-2007, we found that approximately 16% of these companies had venture capital backing. In other words, even among the fastest growing and most successful companies in the U.S., less than one in five had venture investors. Such companies almost certainly could have venture investors if they wanted them, so the absence of venture capital should generally be read as a sign that these growth companies saw no need to take external capital from venture capitalists, whatever the merits of such capital might be."

Another paper, "Performance Persistence in Entrepreneurship" by Gompers, Kovner, Lerner and Scharfstein, provides more insight into this issue. They start by defining success as starting a firm and exiting via an public via an initial public offering.

They conclude that the probability that a once successful entrepreneur will repeat this feat is 30%. This compares to a 21% chance for a first time entrepreneur, and a 22% chance for an experienced entrepreneur who has failed to reach the IPO stage. Undoubtedly, to some extent this reflects the impact of luck on entrepreneurial (and indeed, most) success. For example, in “What Matters More for Entrepreneurial Success: Skills, Personality, or Luck?”, Liechti, Loderer, and Peyer apply econometric techniques to a database of Swiss entrepreneurs and conclude that “luck is about two to three times as important as the other two success factors.” Gompers and his co-authors conclude that while some of the performance differences they find is undoubtedly due to luck, two types of skills also make a difference – market timing (based on the industry in which the business was started, and whether its founding coincided with rising valuation multiples for that sector) and management (the ability to outperform similar businesses, after controlling for founding date). Most interestingly for our discussion, the authors also find that the performance differential between top tier and other VC firms appears only when they invest in companies started by first time entrepreneurs or past failures. As they note, “If successful entrepreneurs are better, then top tier venture capital firms have no advantage identifying them (because their success is public information), and they add little value. And if successful entrepreneurs have an easier time attracting high quality resources and customers because of perception based performance persistence, then top tier venture capital firms add little value.” This point is further reinforced by another researcher, Ola Bengtsson, in his paper “Relational Venture Capital Financing of Serial Entrepreneurs” which finds that “only one in ten VC investments leads to a serial relationship with the entrepreneur involved.”

Closely related to these views is the third argument for structural problems in the venture capital industry – that the nature of venture capital firms themselves has changed, and weakened the appeal of their offering to potential entrepreneurs. To put it succinctly, many critics believe that too many venture capitalists have become more interested in building portfolios than investing in and helping to build great companies. The argument here is very similar to one frequently heard in discussions of active

investment management in other areas – for example, skilled active managers who outperform tend to have more concentrated portfolios, while less skilled (or negatively skilled) managers are usually “closet index huggers” that maintain highly diversified portfolios.

Part of this is due to a change in the type of people who are found at many venture capital funds. Instead of people with operating and company building experience (who dominated in the past), today you find a greater percentage of people whose background is primarily in financial services, where errors of commission are typically more important for career success than errors of omission. This shift may have been caused by the large inflow of funds into venture capital, and the substantial increase in management fees it generated. Many VCs realized that a significant amount of money could be made simply by raising new funds, and compounding the management fees. It may have been the case that a heightened desire to raise follow on funds caused VCs to become more conservative in the way they invested their current funds, such as spreading their investments across a wider range of industries, stages, and geographies, making the financial structure of their commitments less favorable to entrepreneurs (and more favorable to the VC partnership), and tightening their focus on “controlling” the risk in their portfolio companies, through increased reporting requirements and more involvement in day to day decision making. Unsurprisingly, there are lots of stories out there about entrepreneurs questioning the value of the company building advice they get from someone whose career has largely been spent in financial services. They know that making numbers change on a spreadsheet is much easier (and less messy) than making them change in the real world. And that doesn’t make it very pleasant to have to sit through those meetings, much less ask a former Wall Street wonder to sign off on decisions that are based on years of operating experience.

This trend toward larger funds also seems to have led to more emphasis on later stage investments, where larger amounts of money could be invested without substantially increasing the number of portfolio companies (and hence diluting the venture capitalists’ ability to either “add value” or “maintain control” depending on your

perspective on the matter). At the aggregate level, however, later stage investments generate smaller exit multiples, and the reallocation of funds in this direction has helped to depress the average returns earned by the venture industry as a whole.

The last of the arguments in favor of structural problems in venture capital focuses on the changing nature of exit markets, including both initial public offerings and acquisitions trade buyers. With respect to the former, the argument can be boiled down to “fool me once, shame on you; fool me twice, shame on me.” As Kedrosky notes, “It is a mistake to say that the problem is the exit market – it would be more correct to say there is a problem with what venture capitalists once were able to bring to market, but no longer can...[The IPO market] has returned to what it was like before the dot.com bubble...Investors have become less accepting of young, money losing companies.” Similarly, potential corporate acquirers become more conservative not only because financial constraints, but also because they have become much more wary of buying companies that were “build to sell” by financially-oriented entrepreneurs whose main goal was to cash out and leave. This is not to say that corporate acquirers, and indeed corporate venture capital operations, have completely disappeared (e.g., GE still has a thriving operation). But they have become much less willing to pay the high multiples for relatively immature businesses that drive returns on venture capital partnerships.

In sum, not only are cyclical factors depressing the returns from investing in venture capital, but there also seem to be more worrisome structural changes underway. Given this, we do not expect a quick return to higher returns from investing in this sector.

Product and Strategy Notes

Developing Better Foresight

One of the most frequently heard comments about the crash of 2008 is, “I didn’t see it coming.” This raises a critical question: How can you improve the accuracy of your financial forecasts, or, more broadly, the quality of your foresight?

We believe the answer to this question begins with understanding the nature of the system whose behavior we are trying to predict. At one extreme, physical systems are characterized by relationships defined by the laws of physics and chemistry that are stable over time. It should therefore be possible to use a single model to forecast the behavior of such a system with a high level of confidence over both short and long time horizons. Moreover, knowledge of this system's past behavior can be used to accurately specify the values for the variables used to model its future behavior.

At the other extreme, social systems – like financial markets -- are populated by thinking, feeling, and socially interacting agents who adapt their behavior and goals as events unfold, causing the underlying relationships that drive system behavior to be both complex (e.g., multiple causes for an effect, positive feedback loops and non-linear relationships between causes and effects, and wide time separation between causes and effects) and unstable over time. This system presents forecasters with a far more difficult challenge. First, because of the system's complexity, there is an irreducible level of uncertainty associated with the identification of the variables to include in a forecasting model, and the specification of the relationships between them. Second, once one has developed a forecasting model, accurately estimating the future values of the included variables and relationships presents a further challenge – because the system constantly evolves, knowledge of historical values may provide a poor guide to what lies ahead, particularly as the forecast time horizon lengthens. Third, it is often the case that forecasting models and their users are themselves part of the process that drives the evolution of a complex adaptive system. For example, a model that accurately forecasts the price of an asset can be discovered by others, whose subsequent use of the model changes the underlying relationships and competes away its ability to generate profitable predictions.

Beyond understanding the nature of the underlying system, there is the equally challenging issue of the nature of the forecasters themselves. To varying degrees, all human beings are affected by factors that reduce the accuracy of the forecasts they make. Perhaps the most important of these are the so-called “anchoring”, “confirmation” and “overconfidence” biases. Anchoring refers to our tendency to

insufficiently adjust our forecasts when we receive new information. Confirmation refers to the tendency to pay more attention, and give greater weight to information which supports our current forecast, and less to information which contradicts it. Other studies have repeatedly found that many forecasters are overconfident – when asked to provide a range that includes 80% or 95% of possible outcomes, most people provide answers that are too narrow compared to actual results. Put differently, we tend to underestimate volatility and variance, and how they compound over time. Finally, recent research in neurobiology has found that increased uncertainty triggers feelings of fear, as well as stronger desire to avoid social isolation. Put differently, when uncertainty rises, we have a natural tendency to follow the herd, and accept the conventional wisdom about what lies ahead. While that was undoubtedly advantageous eons ago when our ancestors were trying to survive on the East African savannah, it often works to our disadvantage when we are trying to survive and prosper in financial markets.

What can investors do to overcome the challenges they face, and improve the accuracy of their financial forecasts? We believe they should keep three important points in mind. First, they can align the focus and confidence level of their forecast with its time horizon. As we have repeatedly noted, when forecasting the behavior of a complex adaptive system over a long period of time, an analyst should have more confidence in a “strategic warning” for “what” may happen and “why”, than in an operational warning about “how” something might occur, much less a tactical warning about “when, who and where” an event will take place. Over time, the number of tactical possibilities compounds much faster than the number of operational possibilities, which in turn grow faster than the number of possible strategic outcomes. For this reason, models with a short-term forecasting horizon can emphasize their fidelity to historical data as evidence of their likely accuracy. In contrast, for forecasts with longer term horizons a high fidelity to historical data indicates low robustness to uncertainty, which should cause an analyst to have less confidence in its predictions.

These conclusions are generally in line with what we observe in financial markets, where short term tactical trading models are often highly quantitative and

based on recent investor behavior, while long term asset class allocation models focus on fundamental valuation and economic considerations. In the middle lie security and sector investment selection models, which usually include a mix of variables related to fundamental valuation and investor behavior.

Second, as studies have repeatedly shown, investors can increase the accuracy of their predictions (and overcome their confirmation bias) by actively seeking out and combining different forecasts (for a good overview of this research, see “Forecast Combination” by Allan Timmermann). While there are many complex techniques for weighting different forecasts, researchers have found that simple averaging often works surprisingly well, provided that the forecasts are based on different underlying methodologies. This is a critical point, as multiple studies have found that professional forecasters have a tendency to herd (see “Experts’ Earning Forecasts: Bias, Herding And Gossamer Information” by Guedj and Bouchaud). The key benefit of forecast combination is that it tends to cancel out some of the model specification and parameter estimation errors in the individual methodologies. Studies showing the benefits of forecast combination are closely related to other research which has found that confidence in a prediction increases when forecasts based on different methodologies reach similar conclusions (see, “The Good, the Bad and The Ugly of Predictive Science” by Hemez and Ben-Haim).

The third technique that can improve the quality of an investor’s foresight is to always ask these four questions of any forecast he or she makes or receives: What are the critical assumptions upon which it is based? Which of these are the most uncertain? What indicators will tell me they are not turning out as expected? And where should I look for them? The inescapable fact is that our ability to pay attention to information is limited by time and neurobiology, and is further challenged by the deluge of data that technology delivers to us each day. In today’s world, taking a passive approach to the allocation of your scarce attention is likely to reduce the quality of your foresight.

In sum, accurately forecasting the behavior of a complex adaptive system like a financial market is an extremely difficult task, particularly as the time horizon grows

longer. Yet it is still possible to improve one's foresight, and to improve your ability to avoid the painful losses and regrets that so many investors have recently experienced.

Interesting New Research

In an update of a previous paper ("Do Individual Investors Have Asymmetric Information Based on Work Experience?"), Doslak and Hvide analyze (using a very detailed data set from Norway) the validity of an assumption that probably underlies a lot of individual investors' belief in the virtues of active management: Does working in an industry give you an edge? Apparently, lots of people believe that it does, as the authors find that "individuals hold an excess weight in stocks that are professionally close – for example, even after excluding holdings of own-company and previous employer equity, individuals still hold 11% of their portfolio in stocks within their two digit industry code of employment." Unfortunately, the authors conclude their confidence in their apparent edge is misplaced, finding "no evidence that investments in professionally close stocks are associated with a positive abnormal return in either the short or the long term."

Of course, this begs the question of the underlying causes for this result. We can think of three possible explanations: (1) working in an industry mostly exposes you to information that is already in the public domain, and available to other investors who have already acted on it. (2) Working in an industry makes people overconfident about the potential investing advantage conferred by either private information and/or frameworks for understanding public and private information about an industry, leading to overtrading and negative alpha (in fact, the authors of this paper find this result in some specifications of their model). And/or (3), individual investors face obstacles that prevent them from fully capitalizing on the private information or superior industry models to which they have access (e.g., difficulty in taking short or leveraged positions, high trading costs for individual investors, insufficient time to monitor positions and trade on a timely basis, etc.). Whatever the underlying cause (and we suspect that all three are at work), forewarned is forearmed when it comes to being

overconfident about your belief that working in an industry automatically gives you an active investing edge.

As we move into the rebalancing of our model portfolios (which was delayed by the onset of the 2007/2008 crisis), and in light of the behavior of different asset classes during that crisis, we have been focused on two key changes from the past. The first, as regular readers know, is moving from a two regime to a three regime model (from “normal” and “bad” to “normal”, “high inflation” and “high uncertainty”). The second is a greater emphasis on directly incorporating “tail risk” hedges (such as the recently introduced funds that track equity volatility indexes) into a portfolio. Our thinking in this area has recently received more support from two new research papers. In “Tails, Fears, and Risk Premia”, Bollerslev and Todorov conclude that “compensation for rare [extreme] events accounts for a large fraction of the equity and variance risk premia in the S&P 500 index”, and that the fear of disaster varies over time. In “Crash Risk in Currency Markets”, Farhi, Fraiberger, Gabaix, Ranciere and Verdelhan conclude that “disaster risk premia account for about 25% of carry trade [borrowing in low interest rate currencies and investing the proceeds in high interest rate currencies] excess returns in advanced countries.” Both of these papers reinforced our belief in the value of new instruments that make it possible to take a long position in equity market volatility, and in so doing hedge off a portion of a portfolio’s downside tail risk.

Another paper that caught our eye and made us think was “Correlations, Risk and Crisis: From Physiology to Finance” by Goban, Smirnova and Tyukina. We know what you’re probably thinking at this point – something between “get a life” and “gee, you must be so much fun to have at a cocktail party.” But bear with us on this one. In this paper, the authors analyze “the dynamics of correlations and variance in systems under the load of environmental factors.” So far so good. We’ve seen that over the past two years, right? And nobody is quite sure of where things are headed, right? Well, these authors provide an interesting framework for thinking about the uncertainty we face. Specifically, they find that “a universal effect of systems under a load of similar factors is that in crisis states, even before obvious symptoms appear, correlation increases, and, at the same time, variance (standard deviation or volatility)

increases too. After the crisis achieves its bottom, it can develop in two directions: recovering (both correlations and variance decrease) or fatal catastrophe (correlations decrease, but variances do not).” The authors find that this pattern is common across multiple organisms and complex adaptive systems. On balance, we believe that superior foresight comes from a superior mental model for attending to, and making sense of publicly available information, rather than access to private information. This is especially true in the case of asset allocation, as opposed to sector or security selection within an asset class. Papers like this are important because they help us to continually improve our mental models for making sense of the flood of information that confronts us each day.

Another paper in this class, and one which could eventually have a large impact, is “A Satisficing Alternative to Prospect Theory” by Brown, DeGiorgi, and Sim. The authors integrate a number of strands in behavioral decision research, and formalize a theory of choice in the face of uncertainty that makes good intuitive sense to us. Their approach begins with the decision maker specifying an “aspiration level” – say a set of accumulation or decumulation goals. They then show how positions that have more than a threshold probability of achieving the target are always preferred (satisficing), while preference for positions (e.g., asset allocations) below this threshold vary depending on the probability they can achieve the target. Specifically, for relatively more “secure” positions – i.e., those that, while below the satisficing threshold, still have a high probability – greater diversification is preferred to reduce risk. In contrast, when the available positions are less secure (e.g., when there is less money to invest, relative to an accumulation target), greater concentration (more risk) is preferred, since they have a better chance of attaining the goal than a more diversified portfolio. While technical, this paper breaks new ground in terms of setting out a plausible description of the way people make decisions in the real world.

Finally, we’d like to briefly highlight some interesting findings from “Decision Aid Reliance: A Field Study Involving Professional Buy-Side Financial Analysts” by Hunton, Arnold, and Reck. One of our long-standing research interests is how to improve decision making in the face of uncertainty. Researchers from multiple fields

have found that the use of “decision aids” can help in this area, because they focus our attention on the most important elements in a situation and how they are related to each other. A pilot’s pre-flight checklist is one example of this. So are standard company financial ratio analyses sheets found on many websites today, and so are our structured approaches to asset class valuation and economic analysis. The authors of this paper analyzed the use of similar decision aids by buy-side analysts at a mutual fund company. Some of their findings were consistent with previous research (little of which, however, had directly studied the use of DAs in the field): reliance on decision aids increased with task complexity and user confidence in the decision aid, and use of the decision aids produced better results. Two other findings were more surprising: first, higher task ability was associated with greater use of decision aids. Apparently, experts better appreciate the advantages of “offloading” some cognitive tasks to decision aids, presumably so they can devote their attention to other analysis and/or synthesis tasks not captured by the decision aids. Could it be that analysts with lower levels of expertise believe (falsely) that higher reliance on decision aids could somehow threaten others’ perception of their competence? The study provides no data, but our experience tells us this is a hypothesis worthy of further investigation. The second surprising finding was that as performance-contingent incentives increased, reliance on decision aids declined. While this paper doesn’t isolate the performance impact, previous researchers have found that, beyond a certain point, increasing performance based incentives leads to decreasing performance. Perhaps the analysts in this study felt that in order to outperform, they had to take a different view than what the decision aid suggested. Unfortunately, the higher levels of emotional pressure present when performance incentives are high seem to reduce the likelihood that strategy will work. Again, it would be interesting for someone to directly study that issue – but experience tells us what they are likely to find.

More News on the Big Changes Underway for Financial Advisers

As regular readers know, there are major changes underway in the financial advisory business in the U.K., Australia, India and the U.S., largely focused on tighter distinctions between the roles of product salesperson and a fiduciary providing advice, and the elimination of commission payments to the latter, with preference given to fee-based compensation. For example, consider the following excerpts from the recent submission of Quantum Financial Services to the Australian Parliamentary Inquiry into Financial Products and Services: “We note the current major issues facing the financial services industry, including low current consumer opinion towards financial planners / financial advisors; recurring examples of failures of financial institutions and rampant abuse of consumers; [and] lack of professionalism among many who hold themselves out as financial planners/financial advisors...”

“The relationship between product providers and advisers completely taints the professional financial planning advice process and decreases consumer confidence in the whole industry. From the clients’ perspective, typically they trust the advice of the financial planner that the product that they are recommending is the best one for them. They should be able to rely on that advice, free of conflicts of interest that the relationship between the advice and product creates. In our opinion, unfortunately this third relationship is too strong as product providers actively seek to influence financial planners to direct their clients into their products via the following strategies largely hidden to consumers:

- **Volume bonuses** – and other profit sharing arrangements such as platform rebates based on the volume of business a financial planner channels into a particular product provider. These are kickbacks paid to advisors and AFSLs in all but name, pure and simple. Obviously, the more business the financial planner channels into a product provider, the higher the volume bonus or platform rebates and shelf fees they receive.

- **Fee sharing arrangements** – These are a complex form of soft dollar influence not necessarily based on volume sales and therefore not banned under this code, but potentially worth millions of dollars.
- **Provision of soft dollar benefits** – This may include provision of research, lavish lunches, cheap personal financial products (eg mortgage, financing, etc), travel expenses, profit sharing arrangements, payment of conference fees and airfares.
- **Buyer of last resort** – An arrangement where a fund manager guarantees it will buy the financial planning practice when the planner decides to sell if there is no other buyer willing to pay the asking price. That price will multiply in line with business generated by the planner for that fund manager.
- **Ownership of financial planning firms by product providers** – the vast majority of financial planners in Australia work for AFS Licensees owned in part or in whole by product providers. Buying a financial planning firm as a sales force enables product providers to channel clients into their products. This is the easiest way for product providers to influence control the supposedly independent advice process. This can be done easily though staff targeted volume bonuses, approved product lists that make the firms products easier to invest in, providing research on own products, etc. In one of the few public glimpses the public have been allowed to see regarding the large financial planning firms approach to channeling clients into their parent or associated company's products, ASIC reported the following: "*Between January 2005 and October 2005, ninety three (93) percent of all new investment or superannuation business resulting from the advice of AMPFP Planners was invested in AMP products. This is not atypical of dealers*" (*ASIC Enforceable Undertaking of AMP*). We ask you 'Would a reasonable person call this advice or sales?'"

In the U.K., the Financial Services Authority has issued a new consultation paper on its Retail Distribution Review that provides detailed recommendations for the

implementation of reforms that have already been proposed, including a ban on commission payments to advisers by the end of 2012. The FSA clearly states that one of its key goals is making sure that “recommendations made by advisers are not influenced by product providers.” In India, there are proposals to ban front end commissions, and to fully disclose trailing commissions. And in the U.S., the Obama Administration has proposed a rule change that would hold registered broker dealer representatives to the same fiduciary standard that now governs the behavior of Registered Investment Advisers, including much more extensive disclosure of compensation arrangements with product providers.

Other recent articles highlight why the changes that have been proposed across many countries are both long-overdue and critical. A recent article in Australia’s *Money Management* noted that “nearly half of all Australian high net worth clients lost confidence in their wealth management firms and financial advisers during the downturn, leading to 26 percent of all HNW clients withdrawing their assets or leaving the firm altogether in 2008.” Apparently, this trend was strongest among clients who are under 45 years old. In the U.K., *FT Adviser* reported the results of a survey that found “forty percent of private investors said they disagreed with the advice they were given by their advisers over the past 24 months, or felt their advisors were too slow to respond to the challenge of the financial crisis.” Finally, in the *Journal of Indexes*, Jack Bogle offered a new analysis that used funds flow data to compare the actual rates of return earned by investors in different ETFs and index mutual funds with the returns on the underlying indexes over the past five years. The clear conclusion was that over-trading (and the relative underperformance it causes) was much worse among ETF investors. As a result, their realized returns underperformed the indexes by much greater amounts than was the case for investors in index mutual funds, who traded much less. In sum, the financial advice industry seems to be at a turning point, not only in those countries where change is already underway, but also elsewhere, in places like the Eurozone and Canada, where the practices criticized in Australia, the U.K., India and the U.S. are also widespread. We cannot help but think that it will be

increasingly difficult for the Eurozone and Canada to maintain their current systems after substantial changes have been made in these other countries.

Product News that Caught our Eye

In Canada, iShares has launched two new ETFs, one covering emerging markets (XEM) and one tracking the MSCI World Index (XWD). Encouragingly, these new ETFs carry quite low expenses (.45% and .82%, respectively), which hopefully will add to the downward pressure on the average expenses on Canadian investment products, which are among the highest in the regions we cover. In the U.S., there was yet another criticism of leveraged ETF products, this time from the U.S. Financial Industry Regulatory Authority, in a notice to brokers and registered investment advisers, that is worth quoting at some length: “Most leveraged and inverse ETFs “reset” daily, meaning that they are designed to achieve their stated objectives on a daily basis.⁴ Due to the effect of compounding, their performance over longer periods of time can differ significantly from the performance (or inverse of the performance) of their underlying index or benchmark during the same period of time. For example, between December 1, 2008, and April 30, 2009:

- The Dow Jones U.S. Oil & Gas Index gained 2 percent, while an ETF seeking to deliver twice the index's daily return fell 6 percent and the related ETF seeking to deliver twice the inverse of the index's daily return fell 26 percent.
- An ETF seeking to deliver three times the daily return of the Russell 1000 Financial Services Index fell 53 percent while the index actually gained around 8 percent. The related ETF seeking to deliver three times the inverse of the index's daily return declined by 90 percent over the same period.

This effect can be magnified in volatile markets. Using a two-day example, if the index goes from 100 to close at 101 on the first day and back down to close at 100 on the next day, the two-day return of an inverse ETF will be different than if the index had moved up to close at 110 the first day but then back down to close at 100 on the next day. In the first case with low volatility, the inverse ETF loses 0.02 percent; but in the

more volatile scenario the inverse ETF loses 1.82 percent. The effects of mathematical compounding can grow significantly over time, leading to scenarios such as those noted above...NASD Rule 2310 requires that, before recommending the purchase, sale or exchange of a security, a firm must have a reasonable basis for believing that the transaction is suitable for the customer to whom the recommendation is made. This analysis has two components. The first is determining whether the product is suitable for any customer, an analysis that requires firms and associated persons to fully understand the products and transactions they recommend. With respect to leveraged and inverse ETFs, this means that a firm must understand the terms and features of the funds, including how they are designed to perform, how they achieve that objective, and the impact that market volatility, the ETF's use of leverage, and the customer's intended holding period will have on their performance. Once a determination is made that a product is generally suitable for at least some investors, a firm must also determine that the product is suitable for the specific customers to whom it is recommended. This analysis includes making reasonable efforts to obtain information concerning the customer's financial status, tax status, investment objectives and such other information used or considered to be reasonable by such member or registered representative in making recommendations to the customer. While the customer-specific suitability analysis depends on the investor's particular circumstances, ***inverse and leveraged ETFs typically are not suitable for retail investors who plan to hold them for more than one trading session, particularly in volatile markets.***"

In the United States, new Macroshares that track the appreciation (UMM) and depreciation (DMM) of prices in major housing markets began trading. It will be interesting to see how much interest there is in them. UMM is attractive to investors without a current exposure to U.S. residential property, who would like to add that asset class to their portfolio (of course, that begs the question of when to buy it – i.e., when the bottom will be reached – and how much upside there really is in this asset class, given demographic, credit, and economic trends – but those are questions for another day). Theoretically, DMM could be used by an existing homeowner to hedge

downside exposure; as a practical matter, however, the amounts of money involved may make this strategy too expensive for most. An option on DMM or housing futures might be a less costly approach; hopefully this will develop in the future, and be packaged into products that are accessible to retail investors (or even bundled into new mortgage products). Elsewhere, a new paper by Fabozzi, Shiller and Tunaru (“Hedging Real Estate Risk”) provides a very good technical overview of the current state of play in this area.

Last but not least, we note the excellent recent OpEd on longevity bonds in the 28 June 2009 *Financial Times* by Blake, Boardman, Cairns and Dowd of the Pensions Institute at Cass Business School. They review the arguments in favor of the U.K. government (and indeed, governments elsewhere) funding part of their fiscal deficits with longevity bonds, whose payments would rise with the proportion of the population living to 90 years of age or more. As we have noted in the past, this is a product that is long overdue, which would open up a valuable new asset class to investors.

Model Portfolios Update

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

investor is primarily investing in index funds, but is willing to allocate up to ten percent of his or her portfolio to equity market neutral investments.

We use two benchmarks to measure the performance of our model portfolios. The first is cash, which we define as the yield on a one year government security purchased on the last trading day of the previous year. For 2009, our INR cash benchmark is 5.56% (in nominal terms). The second benchmark we use is a portfolio equally allocated between the ten asset classes we use (it does not include uncorrelated alpha). This portfolio assumes that an investor believes it is not possible to forecast the risk or return of any asset class. While we disagree with that assumption, it is an intellectually honest benchmark for our model portfolios' results.

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