Retired Investor

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This Month's Issue: Key Points

This month's first feature article takes an in-depth look at a critical issue: how the supply of and demand for alpha varies over time, and the implications for investors' allocation to active management strategies. In light of our analysis, we conclude that a prudent strategy for most investors has three key elements: (a) limit your overall allocation to active management, because of the relative shortage of alpha supply relative to demand under most market conditions, and the extreme difficulty of identifying managers with significant and sustainable skill; (b) focus your allocation to active management on uncorrelated alpha strategies, and avoid traditional "long only" active products that combine alpha and beta returns (while charging alpha prices for both); and (c) behave as a contrarian, and raise your chances of earning significant alpha returns by increasing your allocation to uncorrelated alpha strategies when markets are in their "downward excess" state.

In our second feature, we catch up on recent developments in the debate between advocates of "fundamental" and market capitalization based indexing. We conclude that

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fundamental indexing is well on its way to proving yet again that in highly competitive global capital markets, free lunches are extremely hard to find and disappear quickly once the sources of information or models on which they are based become more widely understood. Finally, in this month's product and strategy notes, we look at new ETF products for international commercial property, emerging markets bonds and emerging markets infrastructure, more evidence that too many investors are paying alpha fees for beta returns, and new papers covering the history of financial crises and the always popular topic of women and worry.

This Month's Letters to the Editor

I've been following a debate between Rick Ferri and Larry Swedroe on hardassetsinvestor.com on the merits of including commodities in a portfolio. I was wondering what you think about the positions they've taken.

Let's start with some basics. Both Rick Ferri and Larry Swedroe are very smart men whose thinking we respect. In the debate in question, both of them made some very good points with which we agree (and have made here in the past). These include (1) the fact that while returns from simply holding physical commodities have generally been on a secular downtrend over time (see, for example, these papers: "Booms and Slumps in World Commodity Prices" by Cashin, McDermott and Scott; "The Long Run Behavior of Commodity Prices" by Cashin and McDermott, and "The Boom in Non-Fuel Commodity Prices: Can It Last?" by Martin Sommer); (2) the fact that the return generating process for a commodity futures fund is very different from simply holding physicals, and that these investments can generate positive returns due to insurance premia, unexpected price increases, diversification benefits and the return on underlying collateral; (3) the related point that diversification benefits are heightened when the fund in question relatively even allocations to energy, metals and agricultural commodities; and (4) that commodities as an asset class provide good diversification benefits to a portfolio (for example, in their recent paper "Commodities and Equities: A Market of One?", Buyuksahin, Haigh and Robe note that "amidst a sharp rise in commodity investing, many have asked whether commodities nowadays move in sync with

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traditional financial assets." The authors find that "the relation between the prices of, and returns on, investable commodity and U.S. equity indices has not changed significantly in the last fifteen years" nor do they find any "evidence of a secular increase in co-movement between the returns on commodity and equity investments during periods of extreme returns").

On the other hand, there was one point we disagreed with, and that was the question about where an investor should reduce his or her allocation to make room for commodities in their portfolio. There is no glib answer to this question that is universally correct; it all depends on the assumptions you are making about future asset class risks, returns and correlations, the goals you are trying to achieve and the constraints you have set. Apparently, both Rick and Larry were trying to be nice, and didn't bluntly point this out. Finally, we found quite interesting their discussion about whether one could refer to beta and alpha returns in commodity futures. Conceptually, the answer is yes, if you could (a) construct an index that captured the return from investing in all commodity futures, weighted by the relative amounts of each type outstanding; (b) calculate the diversification return generated by that market portfolio; and (c) agree on a single type of collateral to use (e.g., Treasury Bills or TIPS) in order to standardize the return from that source. If you could do all this, that would generate a market (beta) return for the asset class, which you could then use to estimate alphas for different types of strategy (e.g., the different commodities and weighting schemes used by the Goldman Sachs Commodities Index, the Dow Jones AIG Commodities Index, the Rogers International Commodity Index and others, including active trading strategies like the MLM Index). As a practical matter, however, with futures trading divided between many different exchanges around the world (we'll leave over the counter forward contracts out of this for now, but they are functionally the same as futures) point (a) has yet to happen (think about how long it has taken the major suppliers of equity indices to get their products to where they are today). So as a practical matter you can't measure the beta return; at best you can roughly estimate it. In sum, both Rick and Larry made interesting points and it was a good discussion, if not exactly the "debate" that was advertised.

When I enter some very different inputs into your model portfolio generator, I sometimes get the same portfolio. Why is that?

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The short answer is that just as 2 x 2, 8/2, 3+1 and 8-6 all equal 4, so too different combinations of inputs can lead to the same minimum compound annual rate of return requirement, and hence to the same model portfolio. Another way to think of this is as a topographical map, with a series of ridgelines running across it (each representing a model portfolio designed to have a 95% probability of achieving a minimum compound annual rate of return). Depending on how the ridgelines run, very different map coordinates (think of them as model portfolio inputs) can place you on the same ridgeline. An equally interesting question is why sometimes a very slight change in one input parameter will generate a different model portfolio solution, while a bigger change in another parameter will leave the model portfolio solution unchanged. This can sometimes happen in mean variance optimisation models when highly correlated assets (e.g., small and large cap stocks) are treated as distinct asset classes, and a small change is made in assumed future returns. In our simulation optimization approach, we reduce the risk of this happening by defining asset classes very broadly, so that the correlation between their returns is .60 or less. However, you can still produce surprising changes in our model too. The reason this happens is that some of our methodology choices (e.g., the use of constraints on maximum asset class holdings) create non-linearities within the model, so that sometimes a small change in inputs (e.g., time horizon) can produce a significantly different portfolio.

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Global Asset Class Returns

YTD 29Feb08	In USD	In AUD	In CAD	In EURO	In JPY	In GBP	In CHF	In INR
Asset Held								
US Bonds	1.87%	-4.67%	1.10%	-1.96%	-5.45%	1.94%	-6.60%	3.37%
US Prop	-4.06%	-10.60%	-4.83%	-7.89%	-11.38%	-3.99%	-12.53%	-2.56%
US Equity	-8.96%	-15.50%	-9.73%	-12.79%	-16.28%	-8.89%	-17.43%	-7.46%
AUS Bonds	8.25%	1.71%	7.48%	4.42%	0.93%	8.32%	-0.22%	9.74%
AUS Prop	-12.04%	-18.58%	-12.81%	-15.87%	-19.36%	-11.97%	-20.51%	-10.55%
AUS Equity	-7.91%	-14.45%	-8.68%	-11.74%	-15.23%	-7.84%	-16.38%	-6.41%
CAN Bonds	4.00%	-2.54%	3.23%	0.17%	-3.32%	4.07%	-4.47%	5.50%
CAN Prop	-5.61%	-12.15%	-6.38%	-9.44%	-12.93%	-5.54%	-14.08%	-4.11%
CAN Equity	-3.35%	-9.89%	-4.12%	-7.18%	-10.67%	-3.28%	-11.82%	-1.85%
Euro Bonds	8.25%	1.71%	7.48%	4.42%	0.93%	8.32%	-0.22%	9.75%
Euro Prop.	8.78%	2.24%	8.01%	4.95%	1.46%	8.85%	0.31%	10.28%
Euro Equity	-11.06%	-17.60%	-11.83%	-14.89%	-18.38%	-10.99%	-19.53%	-9.56%
Japan Bnds	8.81%	2.27%	8.04%	4.98%	1.49%	8.88%	0.34%	10.31%
Japan Prop	-8.56%	-15.10%	-9.33%	-12.39%	-15.88%	-8.49%	-17.03%	-7.06%
Japan Eqty	-5.72%	-12.26%	-6.49%	-9.55%	-13.04%	-5.65%	-14.19%	-4.22%
UK Bonds	0.89%	-5.65%	0.12%	-2.94%	-6.43%	0.96%	-7.58%	2.39%
UK Prop.	5.71%	-0.83%	4.94%	1.88%	-1.61%	5.78%	-2.76%	7.21%
UK Equity	-9.05%	-15.59%	-9.82%	-12.88%	-16.37%	-8.98%	-17.52%	-7.56%
World Bnds	3.98%	-2.56%	3.21%	0.14%	-3.34%	4.05%	-4.49%	5.47%
World Prop.	-6.35%	-12.89%	-7.12%	-10.18%	-13.67%	-6.28%	-14.82%	-4.85%
World Eqty	-8.86%	-15.39%	-9.62%	-12.69%	-16.17%	-8.78%	-17.32%	-7.36%
Commod	16.79%	10.25%	16.02%	12.96%	9.47%	16.86%	8.32%	18.29%
Timber	-11.11%	-17.65%	-11.88%	-14.94%	-18.43%	-11.04%	-19.58%	-9.61%
EqMktNtrl	-1.46%	-8.00%	-2.23%	-5.29%	-8.78%	-1.39%	-9.93%	0.04%
Volatility	17.96%	11.42%	17.19%	14.13%	10.64%	18.03%	9.49%	19.45%
Currency								
AUD	6.54%	0.00%	5.77%	2.71%	-0.78%	6.61%	-1.93%	8.04%
CAD	0.77%	-5.77%	0.00%	-3.06%	-6.55%	0.84%	-7.70%	2.27%
EUR	3.83%	-2.71%	3.06%	0.00%	-3.49%	3.90%	-4.64%	5.33%
JPY	7.32%	0.78%	6.55%	3.49%	0.00%	7.39%	-1.15%	8.82%
GBP	-0.07%	-6.61%	-0.84%	-3.90%	-7.39%	0.00%	-8.54%	1.43%
USD	0.00%	-6.54%	-0.77%	-3.83%	-7.32%	0.07%	-8.47%	1.50%
CHF	8.47%	1.93%	7.70%	4.64%	1.15%	8.54%	0.00%	9.97%
INR	-1.50%	-8.04%	-2.27%	-5.33%	-8.82%	-1.43%	-9.97%	0.00%

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Asset Class Valuation Update

Our market valuation analyses are based on the assumption that markets are not perfectly efficient and always in equilibrium. This means that 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. In the case of an equity market, we define the future supply of returns to be equal to the current dividend yield plus the rate at which dividends are expected to grow in the future. We define the return investors demand as the current yield on real return government bonds plus an equity market risk premium. As described in our May, 2005 issue, people can and do disagree about the "right" values for these variables. Recognizing this, we present four valuation scenarios for an equity market, based on different values for three key variables. First, we use both the current dividend yield and the dividend yield adjusted upward by .50% to reflect share repurchases. Second, we define future dividend growth to be equal to the long-term rate of total (multifactor) productivity growth. For this variable, we use two different values, 1% or 2%. Third, we also use two different values for the equity risk premium required by investors: 2.5% and 4.0%. Different combinations of all these variables yield high and low scenarios for both the future returns the market is expected to supply (dividend yield plus growth rate), and the future returns investors will demand (real bond yield plus equity risk premium). We then use the dividend discount model to combine these scenarios, to produce four different views of whether an equity market is over, under, or fairly valued today. The specific formula is (Current Dividend Yield x 100) x (1+ Forecast Productivity Growth) divided by (Current Yield on Real Return Bonds + Equity Risk Premium - Forecast Productivity Growth). Our valuation estimates are shown in the following tables, where a value greater than 100% implies overvaluation, and less than 100% implies undervaluation. In our view, the greater the number of scenarios that point to overvaluation or undervaluation, the greater the probability that is likely to be the case.

Equity Market Valuation Analysis at 29 February 2008

Australia	Low Demanded Return	High Demanded Return
High Supplied Return	68%	101%
Low Supplied Return	102%	139%

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Canada	Low Demanded Return	High Demanded Return
High Supplied Return	97%	158%
Low Supplied Return	176%	254%

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Eurozone	Low Demanded Return	High Demanded Return
High Supplied Return	61%	99%
Low Supplied Return	100%	143%

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Japan	Low Demanded Return	High Demanded Return
High Supplied Return	73%	147%
Low Supplied Return	165%	264%

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United Kingdom	Low Demanded Return	High Demanded Return
High Supplied Return	37%	74%
Low Supplied Return	72%	115%

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

Switzerland	Low Demanded Return	High Demanded Return
High Supplied Return	58%	104%
Low Supplied Return	106%	228%

India	Low Demanded Return	High Demanded Return
High Supplied Return	89%	193%
Low Supplied Return	248%	412%

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

Bond Market Analysis as of 29Feb08

	Current Real Rate	Average Inflation Premium (89-03)	Required Nominal Return	Nominal Return Supplied (10 year Govt)	Return Gap	Asset Class Over or (Under) Valuation, based on 10 year zero
Australia	2.61%	2.96%	5.57%	6.15%	0.58%	-5.30%
Canada	1.88%	2.40%	4.28%	3.64%	-0.64%	6.31%
Eurozone	1.93%	2.37%	4.30%	3.87%	-0.43%	4.17%
Japan	1.00%	0.77%	1.77%	1.36%	-0.41%	4.10%
UK	0.96%	3.17%	4.13%	4.47%	0.34%	-3.21%
USA	1.23%	2.93%	4.16%	3.52%	-0.64%	6.31%
Switz.	1.38%	2.03%	3.41%	2.98%	-0.43%	4.25%
India	1.78%	7.57%	9.35%	7.58%	-1.77%	17.73%

*Derived from ten year yield and forecast inflation

It is important to note some important limitations of this analysis. First, it uses the current yield on real return government bonds (or, in the cases of Switzerland and India, the implied real yield if those bonds existed). Over the past forty years or so, this has averaged around 3.00% in the United States. Were we to use this rate, the required rate of return would generally increase. Theoretically, the "natural" or equilibrium real rate of interest is a

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function of three variables: (1) the expected rate of multifactor productivity growth (as it increases, so to should the demand for investment, which will tend to raise the real rate); (2) risk aversion (as investors become more risk averse they save more, which should reduce the real rate of interest, all else being equal); and (3) the time discount rate, or the rate at which investors are willing to trade off consumption today against consumption in the future. A higher discount rate reflects a greater desire to consume today rather than waiting (as consumption today becomes relatively more important, savings decline, which should cause the real rate to increase). These variables are not unrelated; a negative correlation (of about .3) has been found between risk aversion and the time discount rate. This means that as people become more risk averse, they also tend to be more concerned about the future (i.e., as risk aversion rises, the time discount rate falls).

All three of these variables can only be estimated with uncertainty. For example, a time discount rate of 2.0% and risk aversion factor of 4 are considered to be average, but studies show that there is wide variation within the population and across the studies themselves. The analysis in the following table starts with current real return bond yields and the OECD's estimates of multifactor productivity growth between 1995 and 2002 (with France and Germany proxying for the Eurozone). We then try to back out estimates for risk aversion and the time discount rate that would bring theoretical rates into line with those that have been observed in the market. Higher risk aversion factors and lower time discount rates indicate more conservative attitudes on the part of the average investor in a given currency zone. Increasing conservatism raises the risk of sharp downward price moves and increases in volatility when they occur at a time when many asset classes appear to be overvalued. If this conservatism becomes excessive (which is admittedly very hard to gauge), undervaluations may result. In contrast, falling risk aversion and rising time discount factors may indicate a rising danger of overvaluations occurring in asset markets. The real rate formula is [Time Discount Rate + ((1/Risk Aversion Factor) x MFP Growth)].

Real Interest Rate Analysis at 29Feb08

Real Rate Analysis	AUD	CAD	EUR	JPY	GBP	USD
Risk Aversion Factor	3.5	4.0	4.0	5.5	6.0	5.5
Time Discount Rate	2.00%	1.75%	1.75%	1.00%	0.75%	1.00%
MFP Growth	1.60%	1.20%	1.40%	0.60%	1.40%	1.40%

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Real Rate Analysis	AUD	CAD	EUR	JPY	GBP	USD
Theoretical Real Rate	2.46%	2.05%	2.10%	1.11%	0.98%	1.25%
Actual Real Rate	2.61%	1.88%	1.93%	1.00%	0.96%	1.23%

Our bond market analysis also uses historical inflation as an estimate of expected future inflation. This may not produce an accurate valuation estimate, if the historical average level of inflation is not a good predictor of average future inflation levels. For example, if expected future inflation is lower than historical inflation, required returns will be lower. All else being equal, this would reduce any estimated overvaluation or increase any estimated undervaluation. For example, if one were to assume a very different scenario, involving a prolonged recession, accompanied by deflation, then one could argue that government bond markets are actually undervalued today.

Let us now turn to the subject of the valuation of non-government bonds. Some have suggested that it is useful to decompose the bond yield spread into two parts. The first is the difference between the yield on AAA rated bonds and the yield on the ten year Treasury bond. Because default risk on AAA rated companies is very low, this spread may primarily reflect prevailing liquidity and jump (regime shift) risk conditions (e.g., between a low volatility, relatively high return regime, and a high volatility, lower return regime). The second is the difference between BBB and AAA rated bonds, which may tell us more about the level of compensation required by investors for bearing credit risk. For example, between August and October, 1998 (around the time of the Russian debt default and Long Term Capital Management crises), the AAA-Treasury spread jumped from 1.18% to 1.84%, while the BBB-AAA spread increased by much less, from .62% to .81%. This could be read as an indication of investor's higher concern with respect to the systematic risk implications of these crises (i.e., their potential to shift the financial markets into the low return, high volatility regime), and lesser concern with respect to their impact on the overall pricing of credit risk.

The following table shows the average level of these spreads between January, 1970 and December, 2005 (based on monthly Federal Reserve data), along with their standard deviations and 67% (average plus or minus one standard deviation) and 95% (average plus or minus two standard deviations) confidence range (i.e., based on historical data, 95% of the

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time you would expect the current spreads to be within two standard deviations of the long term average).

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

At 28 February 2008, the AAA minus 10 year Treasury spread was 1.84%. This is significantly above the long-term average compensation for bearing liquidity and jump risk (assuming our model is correct), and reflects a clear market reaction to the severe liquidity problems that roiled the markets since August and have yet to abate.

At the end of the month, the BBB minus AAA spread was 1.33%. This is still not significantly different from the long-term average compensation for bearing credit risk. However, it seems low given the continuing turmoil in credit markets. We still believe that it is more likely that credit risk is underpriced rather than overpriced today, and that corporate bonds remain overvalued rather than undervalued.

For an investor contemplating the purchase of foreign bonds or equities, the expected future annual percentage change in the exchange rate is also important. Study after study has shown that there is no reliable way to forecast this, particularly in the short term. At best, you can make an estimate that is justified in theory, knowing that in practice it will not turn out to be accurate. That is what we have chosen to do here. Specifically, we have taken the difference between the yields on ten-year government bonds as our estimate of the likely future annual change in exchange rates between two regions. According to theory, the currency with the relatively higher interest rates should depreciate versus the currency with the lower interest rates. Of course, in the short term this often doesn't happen, which is the premise of the popular hedge fund "carry trade" strategy of borrowing in low interest rate currencies, investing in high interest rate currencies, and, essentially, betting that the change

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in exchange rates over the holding period for the trade won't eliminate the potential profit. Because (as noted in our June 2007 issue) there are some important players in the foreign exchange markets who are not profit maximizers, carry trades are often profitable, at least over short time horizons. Our expected medium to long-term changes in exchange rates are summarized in the following table:

Annual Exchange Rate Changes Implied by Bond Market Yields on 29Feb08

	To AUD	**To CAD**	**To EUR**	**To JPY**	**To GBP**	**To USD**	**To CHF**	**To INR**
From								
AUD	0.00%	-2.51%	-2.28%	-4.79%	-1.68%	-2.63%	-3.17%	1.43%
CAD	2.51%	0.00%	0.23%	-2.28%	0.83%	-0.12%	-0.66%	3.94%
EUR	2.28%	-0.23%	0.00%	-2.51%	0.60%	-0.35%	-0.89%	3.71%
JPY	4.79%	2.28%	2.51%	0.00%	3.11%	2.16%	1.62%	6.22%
GBP	1.68%	-0.83%	-0.60%	-3.11%	0.00%	-0.95%	-1.49%	3.11%
USD	2.63%	0.12%	0.35%	-2.16%	0.95%	0.00%	-0.54%	4.06%
CHF	3.17%	0.66%	0.89%	-1.62%	1.49%	0.54%	0.00%	4.60%
INR	-1.43%	-3.94%	-3.71%	-6.22%	-3.11%	-4.06%	-4.60%	0.00%

Our approach to valuing commercial property securities as an asset class is hindered by a lack of historical data about rates of dividend growth. To overcome this limitation, we have assumed that markets are fairly valued today (i.e., the expect supply of returns equals the expected returns demanded by investors), and "backed out" the implied future real growth rates for dividends (which over time should correlated with the real change in rental income) to see if they are reasonable in light of other evidence about the state of the economy (see below). This analysis assumes that investors require a 2.5% risk premium above the yield on real return bonds to compensate an investor for the risk of securitized commercial property as an asset class. The following table shows the results of this analysis:

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Commercial Property Securities Analysis as of 29Feb08

Country	Real Bond Yield	Plus Commercial Property Risk Premium	Less Dividend Yield on Commercial Property Securities	Equals Implied Rate of Future Real Dividend Growth
Australia	2.6%	2.5%	7.2%	-2.1%
Canada	1.9%	2.5%	5.4%	-1.0%
Eurozone	1.9%	2.5%	3.7%	0.7%
Japan	1.0%	2.5%	2.0%	1.5%
Switzerland	1.4%	2.5%	1.5%	2.3%
United Kingdom	1.0%	2.5%	2.9%	0.5%
United States	1.2%	2.5%	4.9%	-1.2%

If you think the implied real growth estimates in the last column are too high relative to your expectation for the future real growth in average rents, this implies commercial property securities are overvalued today. On the other hand, if you think the implied growth rate is too low, that implies undervaluation. Since we expect a significant slowdown in the global economy over the next few years, we are inclined to view most of these implied real growth assumptions as still too optimistic (with the possible exception of Australia), and therefore to believe that the balance of business cycle and valuation evidence suggests that commercial property securities in many markets are likely overvalued today.

To estimate the likely direction of short term commodity futures price changes, we compare the current price to the historical distribution of futures index prices. Between 1991 and 2005 period, the Dow Jones AIG Commodities Index (DJAIG) had an average value of 107.6, with a standard deviation of 21.9. The 29 February 2008 closing value of 215.52 was almost five standard deviations above the long term average (assuming the value of the index is normally distributed around its historical average, a value greater than three standard deviations away from that average should occur less than 1% of the time). We are clearly in unchartered territory, whether due to speculation, a collective fear of high future inflation and/or a substantial decline in the value of the U.S. dollar versus many other currencies, and/or fundamental structural changes in commodity markets (e.g., the peak oil thesis, and the increasing use of agricultural commodities for fuel as well as food). Until the underlying

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factors driving the DJAIG higher become clearer, we continue to believe that the probability of a near term decline in the spot price of the DJAIG still seems much higher than the probability of a substantial further increase. At any given point in time, the current price of a commodity futures contract should equal the expected future spot price less some premium (i.e., expected return) the buyer of the future expects to receive for bearing the risk that this forecasted future spot price will be inaccurate. However, the *actual* return realized by the buyer of the futures contract can turn out to be quite different from the expected return. When it occurs, this difference will be due to unexpected changes in the spot price of the contract that occur after the date on which the futures contract was purchased but before it is closed out. If the unexpected change in the spot price is positive, the buyer of the futures contract (i.e., the investor) will receive a higher than expected return; if the unexpected price change is negative, the buyer's return will be lower than expected. In a perfectly efficient market, these unexpected price changes should be unpredictable, and over time net out to zero. On the other hand, if the futures market is less than perfectly efficient – if, for example, investors' emotions cause prices to sometimes diverge from their rational equilibrium values – then it is possible for futures contracts to be over or undervalued.

Our approach to assessing the current valuation of timber is based on two publicly traded timber REITS: Plum Creek (PCL) and Rayonier (RYN). As in the case of equities, we compare the return these are expected to supply (defined as their current dividend yield plus the expected growth rate of those dividends) to the equilibrium return investors should rationally demand for holding timber assets (defined as the current yield on real return bonds plus an appropriate risk premium for this asset class). Two of these variables are published: the dividend yields on the timber REITS and the yield on real return bonds. The other two variables have to be estimated, which presents a particularly difficult challenge with respect to the rate at which dividends will grow in the future. A number of factors contribute to the expected future growth rate of timber REIT dividends. These are listed in the following table, along with the assumptions we make about their future values:

Return Driver	**Assumption**
Biological growth of trees	This varies widely according to the type and maturity a given timber property (and, indeed, biological growth doesn't directly translate into returns as different trees and growing arrangements also involve different costs. We assume 6% as the long term average.

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Return Driver	**Assumption**
Harvesting rate	In order to produce a timber REIT's dividend, a certain physical volume of trees must be harvested each year. This will vary over time; for example, when prices are high, a smaller volume will have to be cut to pay for a given level of dividends. As a long term average, we assume that 5% of tree volume is harvested each year.
In-growth of trees	This refers to the fact that as trees grow taller and wider, they are capable of producing products with substantially higher values. This so called "grade change" will cause an increase in value (and hence return) of timber even when prices within each product category are falling. We assume this adds 3% per year to the return on timber assets.
Change in prices of timber and land on which the trees are growing	We assume that over the long term prices will just keep pace with inflation. In the U.S. some data shows real price increases of 2% per year over the past 20 years; however, IMF data shows real price declines on a world timber price index. Hence, we assume the contribution of real timber price changes to long term timber returns is zero.
Diversification across countries	As in the case of commodities, that an investor in an internationally diversified portfolio of timber assets should earn a diversification return, similar to the one earned by investors in a well diversified portfolio of commodity futures contracts. In the interest of conservatism, we assume that in the case of timber this equals zero.
Carbon credits	In the future, investors in timberland may earn additional returns from the receipt and resale of carbon credits. However, since the future value of those credits is so uncertain, we have assumed no additional return from this source.

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This leaves the question of the appropriate return premium to assume for the overall risk of investing in timber as an asset class. Historically, the difference between returns on the NCRIEF timberland index and those on real return bonds has averaged around six percent. However, since the timber REITS are much more liquid than the properties included in the NCRIEF index, we have used four percent as the required return premium for investing in liquid timberland assets.

Given these assumptions, our assessment of the valuation of the timber asset class at 29 February 2008 is as follows:

Average Dividend Yield	4.30%
Plus Long Term Annual Biological Growth	6.00%
Less Percent Harvested Each Year	(5.00%)
Plus Average Annual Ingrowth Value Increase	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	**8.30%**
Real Bond Yield	1.23%
Plus Risk Premium for Timber	4.00%
Equals Average Annual Real Return Demanded	**5.23%**
Ratio of Returns Demanded/Returns Supplied Equals Valuation Ratio (less than 100% implies undervaluation)	**63.0%**

Our approach to assessing the current value of equity market volatility (as measured by the VIX index, which tracks the level of S&P 500 Index volatility implied by the current pricing of put and call options on this index) is similar to our approach to commodities. Between January 2, 1990 and December 30, 2005, the average value of the VIX Index was 19.45, with a standard deviation of 6.40. The one standard deviation (67% confidence interval) range was 13.05 to 28.85, and the two standard deviations (95% confidence) range was from 6.65 to 32.25. On 29 February 2008, the VIX closed at 26.54, about equal to the

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VIX's long term average value. However, we believe this level is too low in light of rising uncertainty in the world economy and continuing turmoil in financial markets. Hence, we conclude that equity volatility is probably still undervalued today.

Sector and Style Rotation Watch

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

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

We publish this table to make an important point: there is nothing unique about the various rotation strategies we describe, which are widely known by many investors. Rather, whatever active management returns (also known as "alpha") they are able to generate is directly related to how accurately (and consistently) one can forecast the turning points in the economic cycle. Regularly getting this right is beyond the skills of most investors. In other words, most of us are better off just getting our asset allocations right, and implementing them via index funds rather than trying to earn extra returns by accurately forecasting the ups and downs of different sub-segments of the U.S. equity and debt markets. That being said, the

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highest rolling three month returns in the table give 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 most investors are anticipating the economic and interest rate conditions noted at the top of the next column* (e.g., if long maturity bonds have the highest year to date returns, a plurality of bond investor opinion expects rates to fall in the near future). Comparing returns across strategies provides a rough indication of the extent of agreement (or disagreement) investors about the most likely upcoming changes in the state of the economy. When the rolling returns on different strategies indicate different conclusions about the most likely direction in which the economy is headed, we place the greatest weight on bond market indicators. Why? We start from a basic difference in the psychology of equity and bond investors. The different risk/return profiles for these two investments produce a different balance of optimism and pessimism. For equities, the downside is limited (in the case of bankruptcy) to the original value of the investment, while the upside is unlimited. This tends to produce an optimistic view of the world. For bonds, the upside is limited to the contracted rate of interest and getting your original investment back (assuming the bonds are held to maturity). In contrast, the downside is significantly greater – complete loss of principal. This tends to produce a more pessimistic (some might say realistic) view of the world. As we have written many times, investors seeking to achieve a funding goal over a multi-year time horizon, avoiding big downside losses is arguably more important than reaching for the last few basis points of return. Bond market investors' perspective tends to be more consistent with this view than equity investors' natural optimism. Hence, when our rolling rotation returns table provides conflicting information, we tend to put the most weight on bond investors' implied expectations for what lies ahead.

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Three Month Rolling Nominal Returns on Classic Rotation Strategies in the U.S. Markets

Rolling 3 Month Returns Through	***29Feb08***			
Economy	Bottoming	Strengthening	Peaking	Weakening
Interest Rates	Falling	Bottom	Rising	Peak
Style and Size Rotation	Small Growth (DSG) **-9.99%**	Small Value (DSV) **-7.40%**	Large Value (ELV) **-9.42%**	Large Growth (ELG) **-9.49%**
Sector Rotation	Cyclicals (IYC) **-9.85%** Technology (IYW) **-15.14%**	Basic Materials (IYM) **2.56%** Industrials (IYJ) **-8.30%**	Energy (IYE) **3.40%** Staples (IYK) **-8.70%**	Utilities (IDU) **-10.25%** Financials (IYF) **-16.00%**
Bond Market Rotation	Higher Risk (HYG) **-3.68%**	Short Maturity (SHY) **2.99%**	Low Risk (TIP) **5.05%**	Long Maturity (TLT) **0.97%**

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

Probably Overvalued	Commodities, Corporate Bonds/Credit Risk, Equity Markets (except Australia, Eurozone, and UK)
Likely Overvalued	Commercial Property except Australia
Possibly Overvalued	
Possibly Undervalued	Australian Dollar and UK Pound Government Bonds; UK Equity; Australia Commercial Property
Likely Undervalued	Euro, Canadian Dollar and Australian Dollar Real Return Bonds
Probably Undervalued	Non-U.S. Dollar Bonds (based on expected XR changes), Equity Volatility, and Timber

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The Supply of Alpha and the Returns from Active Management

As the movement to separate alpha from beta investing continues to gain momentum, there is one question that few have thus far asked: With demand for alpha rising, will there be a sufficient supply of it available to justify the high fees (e.g., 2% or more of assets under management, plus 20% of the returns above a threshold) being charged by hedge funds and other "pure alpha" active managers?

Before delving into this question, we need to start with some important background information. An asset class return generating process can be broken down into two parts. The first is common to all the securities that make up the asset class. It is often called the "systematic" or "non-diversifiable" return on the asset class. The second return source is either unique to a specific company, or common only to a subset of companies within the overall asset class (e.g., small companies, or companies in the energy sector). Here is a simple example. Consider an asset class made up of only two securities, which have equal weightings on all possible measures (e.g., their market capitalization, their book value, their sales, etc.). The observed return on security A is 7%; the return on security B is 3%. The average return is 5%, which represents the systematic (or expected) return from investing in the asset class as a whole, which would be received by an investor who owned both A and B. The unique return on Security A is 2%, and on B it is (2%).

This simple example illustrates a number of critical points. First, in any given period of time, at the asset class level, the unique returns (also called "alpha" returns) cancel each other out, leaving only the systematic return. Traditionally, this has been referred to as the "market" or "beta" return. Investing with the objective of earning only this broad asset class return should, in our view, be called "asset class investing", "market investing", "beta investing" or "passive investing." As you can see, the distinguishing characteristic of the market return for an asset class is that it requires no ability or attempt to forecast A and B's future returns. It simply seeks the return that comes from owning all the securities in the asset class.

Second, return is compensation for bearing risk. At the asset class level, you receive only systematic market return, which compensates you for bearing systematic market risk. This systematic return is composed of two parts: the risk free rate (which compensates you for

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deferring consumption) and an asset class risk premium. Most important, earning this asset class risk premium does not depend on skill.

A third insight from our simple example is that, when you take on additional unique risks that can be avoided through diversification, you may receive additional compensation in the form of positive alpha – or you may lose money in the form of negative alpha. In the short term, positive alpha can be due to either luck or forecasting skill. However, as your time horizon grows longer, positive alpha depends much more on the presence of skill, in either obtaining information that is superior to that possessed by other investors, or by building models that due a superior job of making sense of either private or publicly available information. The so-called "Information Ratio" measures how much alpha you receive per unit of additional unique risk (compared to the asset class benchmark) you took on to earn it. An investment manager with the skill to capture positive alpha is highly valued by investors, because those positive returns are uncorrelated with broad market returns. They can therefore increase overall portfolio returns with only a minimal impact on risk. Investment products that pursue such returns are known as "uncorrelated alpha strategies", of which equity market neutral funds (which go short the market to eliminate the market component of the returns on the specific stocks they are long) are perhaps the best known example.

The fourth point is that an active management strategy costs more to implement than one that seeks only beta returns. Truly skilled managers, analysts and traders do not come cheap (of course, the same can be said of unskilled active managers!). That is why, for example, a broad equity asset class index fund costs much less to own than an equity market neutral fund.

The fifth point from our simple example is that broad asset class or passive investing, as we define it is not the same as "indexing" which is often used as a synonym for it. In our example, we measured the performance of our two-security asset class by constructing an index, which put equal weights on A and B. The index return was equal to 5%. But suppose that A and B differed from each other in ways besides their return. For example, suppose A had higher revenues and book assets, but lower market capitalization than B. What weights would we then use to construct our index to measure the systematic return on our asset class?

This is a critical point, because the use of two different benchmark indexes to measure market (beta) return will lead to two different estimates of the size of an active manager's

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alpha. If that manager's compensation is in any way tied to the amount of alpha he or she generates (as is usually the case), this creates a potential conflict of interest. For this reason, most benchmark decisions are made by third parties. Still, that begs the question of the most appropriate weighting scheme to use. While market capitalization weighting has come in for its share of criticism recently (see the next article in this month's issue), it remains in our view the best measure of beta returns, because it is the only approach that is equal to the holdings of all investors in a given asset class. In that sense, it provides the most accurate measure of the return from a truly passive investment strategy. For the rest of this article, we will therefore define "alpha" as the return on a given portfolio after subtracting the return on the market capitalization weighted broadly defined (e.g., equities, not small cap equities) asset class portfolio.

Given this definition, we also need to take a slight detour to discuss the subject of so-called "factor beta". For example, the returns from a tilt towards small cap or value stocks are often referred to as "factor betas." From our perspective, they are not betas (returns for holding the risk inherent in an asset class) at all, but rather something quite different: they are alphas that, assuming an accurate forecast of future returns, can be obtained by investors at a very low cost because the underlying strategies (i.e., the tilt towards small cap or value stocks) have been (a) identified; (b) converted into algorithms, enabling them to be represented by indices and replicated at a very low cost; and (c) used to produce investable "index fund" products. Since an accurate forecast is required to earn alpha from these tilts, they are, by our definition, a form of alpha, and not beta at all. Call us strict constructionists on this point!

Now that we've covered the preliminary issues, let's get to the heart of the argument. Where does alpha come from? The answer crucially depends on your time frame. In any given year, alpha is a zero sum game, since individual security alphas above and below the overall market return (assuming market capitalization weighting) by definition must offset each other. Hence, in any given year, the only way to earn positive alpha is at the expense of other investors who earn negative alpha.

This raises an even more important question, that lies at the heart of this article: Where do those negative alphas come from? Or, put differently, what generates the supply of "annual alpha?" Broadly, it comes from three sources: (1) some investors reach incorrect

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conclusions about future asset prices; in this case, the amount of potential alpha created is a function of the size of the investor's average valuation mistake times the amount of assets they control (hence, a lot of small investors making big mistakes may create less potential alpha than a big investor making a relatively small valuation error); (2) changes in liquidity force some investors to sell assets for less than what they believe they are worth or encourage them to increase their preference for risk, and buy assets at prices above their fundamental value; and (3) the actions of financial market participants who are pursuing goals other than the maximization of risk adjusted returns. Let's look at all of these in more detail.

The future price of an asset results from the interaction of two forces: changes in its fundamental value, and changes in investor behavior. Both can generate asset pricing errors. Attempts to establish the fundamental value of an asset must confront at least three different potential sources of error. The first is an incorrectly specified valuation model. For example, if you are trying to forecast future cash flows, how do you properly incorporate factors like changing customer needs, competitor offerings and technological possibilities, not to mention the threat of substitutes, changes in buyer and supplier power, and the quality of management's plans and execution? When you think of it that way, modeling all this as a series of future cash flows and confidence intervals around them is really quite a coarse view of the actual underlying dynamics that drive changes in fundamental value. And as the underlying complexity of the systems generating those cash flows (e.g., the organization itself and the environment in which it competes) grow more complex, the difficulty of accurately modeling it, even at a coarse level, compounds exponentially.

The second potential error is the values you attach to the variables you have included in your model – for example, future revenues, costs, and the discount rate (including the real interest rate, inflation, the inflation risk premium, and the appropriate market and company specific equity risk premiums). There are two key sources of estimation errors. The first is that new information diffuses only gradually across a population of investors (see, for example, "Innovation Difusion in Heterogenous Populations" by Peyton Young, and "The Value of Information in Financial Markets: An Agent Based Simulation" by Toth and Scalas). The second source of estimation error is the cognitive limitations of investors. In this regard, repeated studies have shown that many investors suffer from overoptimism (i.e., a tendency to overestimate future average returns), overconfidence (i.e., a tendency to underestimate the

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future variability of future returns) and the so-called "confirmation bias" --, a tendency to selectively attend to information that confirms existing views and to ignore and/or underweight information that contradicts them (see "Superior Information or a Psychological Bias?" by Korniotis and Kumar for a unified treatment of information and cognition issues as they relate to asset pricing mistakes)..

The third potential source of error is so-called "non-stationarity", or changes in the underlying structure of an industry, economy or financial system that render previously accurate models and variable assumptions obsolete. As the economy itself becomes more complex, the likelihood of non-stationarity increases.

On the other hand, there are other forces that work that tend to reduce the extent of fundamental valuation errors. For example, the widespread availability of the internet has given investors easier and more timely access to critical information and valuation models. So too, as behavioral finance research has highlighted the role played by cognitive limitations, many investment processes have become more structured and disciplined in an attempt to overcome them.

While still undoubtedly challenging, attempts to accurately estimate the fundamental (or "fair") value of an asset are often easy in comparison to forecasting the future behavior of other investors. In broad terms, the same three sources of error are present: incorrect models, incorrect assumptions, and changes in the structure of the underlying system. Yet the overall challenge is much more complex. For example, a model of investor behavior must, in one way or another, take into account the information they have available and, more important, will actually pay attention to; the mental models they will use to make sense of it (e.g., the weights they will give different pieces of information), the range of behaviors from which they can chose their reaction to new information, the goals they are pursuing, and the external and internal (emotional) constraints on their behavior. Investors are heterogenous along all of these dimensions, which vastly complicates the forecasting challenge (see, for example, "Investor Attention and Time Varying Comovements" by Peng, Xiong and Bollerslev, "Innovation Diffusion in Heterogenous Populations" by H. Peyton Young, or "The Epidemiology of Macreconomic Expecations" by Christopher Carroll). The classic example of this challenge is the so-called "beauty contest" game, where the goal is to pick not the objectively right answer, but rather the answer that the highest number of other players will

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choose. Multiple studies have shown that the depth of reasoning required to win beauty contest games is beyond the cognitive capacity of most people (see, for example, "Who's a Pretty Boy Then?" by James Montier; "Revealing the Depth of Reasoning in Beauty Contest Games" by Patrizia Sbriglia; "Beauty Contests and Iterated Expectations in Asset Markets" by Allen, Morris, and Shin; and "All That I Have to Say Has Already Crossed Your Mind" by Koppl and Rosser). On the other hand, better availability of information and improved models of human decision making are also working to reduce pricing mistakes that result from incorrect forecasts of other investors future behavior. Once again, the amount of alpha supplied by behavioral forecasting errors is a function of the tension between rising complexity and increasingly sophisticated investment processes.

The second major source of alpha is changes in liquidity. For example, some investors inevitably encounter circumstances that force them to sell assets for less than what they believe they are worth. Broadly speaking, this happens for two reasons. The first is the imposition of a liquidity constraint, at the level of the individual investor (e.g., due to job loss or the need to fund a major purchase, such as a down payment on a car or house, or unexpected medical expenses). Less frequently, the liquidity constraint can be imposed at the level of the market as a whole (e.g., the current credit market problems, which have caused banks to cut credit lines to hedge funds, forcing the latter to sell assets to repay their loans). At the other end of the spectrum, sharp increases in liquidity can cause some investors to imprudently increase their willingness to bear risks (technically, reduce the risk premium they demand to hold an asset), and thereby cause them to buy assets at prices higher than their fundamental value, in the belief that "greater fools" will eventually allow them to make profits on these trades.

The third major source of alpha is the actions of players who are pursuing something other than the maximization of risk adjusted returns. One example of this is a multinational corporation that buys foreign exchange in order to facilitate a transaction. It might sell Euros (that it expects to appreciate) to buy dollars in order to purchase raw materials for its plant in Germany. Another example is a central bank (say, China's) that purchases assets (say, U.S. government bonds) it expects to depreciate in value (say, because of a depreciation of the U.S. dollar versus the renminbi) because it is pursuing a political goal (keeping the world economy from plunging into a deep recession and triggering domestic unrest in China).

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Having identified the main processes that give rise to the supply of alpha, let us move on to the next logical question: is there any reason to believe that the strength of these processes, and hence the amount of potential alpha created, varies over time? We conclude that the answer is an unequivocal "yes."

Consider alpha supplied by investors who make fundamental valuation mistakes. It seems obvious that the number and magnitude of those mistakes will increase when the underlying forecasting challenge becomes more daunting. And what would cause this to happen? First, a system that is increasing in complexity, in the sense that causes are becoming further removed in time from the effects they produce, and those effects are becoming more non-linear. Or a system suddenly forced into a period of rapid change by an external shock, or internal forces that push it past the so-called "tipping point." Repeated studies have shown that human beings are notably inept when it comes to forecasting the behavior of complex adaptive systems, particularly when they are going through a so-called "phase change" (e.g., a major technology shift, or entry of China and India into the world trading system, analogous to the instability and non-linearities that accompany the transition of a liquid into a gas). Under these conditions, at the company level survival dictates that traditional planning give way to rapid adaptation, which by definition makes much more difficult the challenge faced by investors who are trying to forecast its future performance. (See, for example, "On the Origin of Strategy: Action and Cognition Over Time" by Gavetti and Rivkin, and "Recognizing the New" by Gavetti and Warglien, "Inductive Reasoning and Bounded Rationality Reconsidered" by Fogel, Chellapilla, and Angeline; "Strategic Planning Amidst Massive Uncertainty in Complex Adaptive Systems" by Paul Davis; and The Origin of Wealth by Eric Beinhocker).

Similarly, the challenge faced by investors trying to forecast the behavior of other investors also varies over time. The classic example of this is the so-called "herding" phenomenon, where, rather than acting on their private information, investors make decisions on the basis of their observations of the actions taken by others, without knowledge of the information upon which those actions were based. This can cause prices to vary widely from their fundamental value, sometimes for extended periods of time. The classic example of this was internet stocks in 1999 and 2000, when many investors kept buying them, despite their growing private belief that they were overvalued. Other research has shown that herding is not

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an exclusively irrational phenomenon (see, for example, "Rational Herding in Financial Economics" by Devenow and Welch, and "Running with the Devil: The Advent of a Cynical Bubble" by James Montier). In fact, some researchers have concluded that herding is becoming more common (see "The Case for Market Inefficiency" by Bird, He, Thosar and Woolley). In addition, piercing the confusion caused by rational herding is made much more difficult by the fact that research has also shown that irrational investors can survive in, and indeed have a significant impact on financial market prices for an extended period of time (see, for example, "The Price Impact and Survival of Irrational Traders" by Kogan, Ross, Wang and Westerfield, "Noise Traders and Herding Behavior" by Lee Redding, "Systematic Noise" by Baber, Odean and Zhu; "Does Noise Create the Size and Value Effects?" by Arnott, Hsu, Liu and Markowitz; "An Experimental Study of Inequality and Unpredictability in an Artificial Cultural Market" by Saiganik, Dodds, and Watts, and "Natural Selection in Financial Markets: Does It Work?" by Hongjun Yan).

It is also clear that liquidity – at both the individual and the overall market level -- tends to vary over time (see, for example, "Market Liquidity and Funding Liquidity" by Brunnermeier and Pedersen, "Market Liquidity and Trading Activity" by Chordia, Roll and Subrahmanyam, and "Stock Market Liquidity and the Macroeconomy" by Choi and Cook). Finally, history also shows that the amount of activity by players pursuing goals other than maximizing risk adjusted return also varies over time.

We conclude that changes in the major drivers of alpha supply – the variance of investor predictions about fundamental value, the variance of investor forecasts for changes in the preferences and actions of other investors, and variation in the level of liquidity and the participation of non-return maximizing players – most likely gives rise to three different "alpha states."

In the "normal state", no widespread herding is observed and liquidity provision is within its normal parameters. Under these conditions, the supply of alpha is predominantly driven by heterogeneity in investors' predictions for future fundamental values and the future actions of other investors. Given underlying investor psychology, in this state relatively more alpha is likely to be supplied by investors erring on the side of overvaluation rather than undervaluation. This somewhat complicates matters for those investors demanding/seeking alpha, as going short an overvalued asset is almost always more difficult to implement than

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going long an undervalued asset. As John Maynard Keynes famously said, with respect to betting against overvaluations by taking short positions: "The market can stay irrational longer than you can stay solvent." This challenge is substantially magnified in the “upside excess” state, which (as we have seen in recent years) optimistic herding, sometimes reinforced by excessive liquidity, can produce substantial and prolonged overvaluations, and an unusually large supply of potential alpha. Given the challenges and risks of taking short positions, some analysts have concluded that staying long even in an overvalued market might be a preferable strategy for capturing alpha (see “Riding Bubbles” by Kole, Guenster and Jacobsen). At the other end of the spectrum, a “downside excess” state also produces higher than average supplies of potential alpha, due to a combination of negative herding and liquidity contraction. The good news is that since going long is easier than going short, the downside excess state should also produce relatively higher amounts of realized as well as potential alpha.

Up to now we have focused on the supply of potential alpha, and concluded that it is likely to vary over time. The next logical question to ask is whether the demand for alpha also varies. History suggests that it does. Consider the reaction of many investors to the “downside excess” state – rather than dedicating more resources to the pursuit of alpha, they tend to increase their allocation to low risk beta strategies, like government bonds. At the same time, with liquidity contracting, the amount of capital (technically, leverage) available to those investors still pursuing alpha in the downside excess state also declines. In contrast, in the “upside excess” state, the amount of capital seeking alpha tends to increase, due to both changes in investor preferences and changes in liquidity.

Now let us consider both sides of the alpha equation together, and their implications for investors’ realized alpha returns. In the normal state, the supply of alpha is predominantly driven by heterogeneity in investors’ predictions for future fundamental values and the future actions of other investors. On balance, improved information and investment processes may have reduced the potential supply of alpha that is available in the normal state. On the other side, demand for alpha in the normal state has probably increased, as more investors seek higher returns to offset increases in the size of their unfunded liabilities (e.g., due to increased longevity, if you are a pension plan, or reduced savings and rising health care and university

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costs, if you are an individual). Taken together, we conclude that the expected returns from active management in the normal state have probably decreased, all else being equal.

In the "excess upside" state, we have seen how the challenge of shorting overvalued assets probably reduces the amount of realizable alpha at the very time that the demand for alpha is increasing. Logically, this should drive down realized alpha returns in this state. Finally, in the "excess downside" state, while the supply of potential alpha tends to expand, the demand for it tends to contract, which should produce the highest returns to active management of any of our three states. Taking all states into consideration, we conclude that there is good reason to suspect that large realized alpha returns from active management may be much harder to deliver in the future than they have been in the past. If this were not the case, then we would not expect to see so many active managers selling insurance (in the form of derivatives) and mistakenly (to take a charitable view) calling the premiums they receive "alpha."

Thus far, our analysis has been limited to what happens in a single period of time, during which realized positive and negative alphas by definition must net out to zero, leaving only the market return. Let us now turn out attention to the dynamic aspect of the issue, and the specific question of whether the absolute supply of potential alpha might be increasing over time, even in the normal and upside excess states. In our view, three major trends are at work.

The first is the entry of large numbers of new investors into financial markets, whether due to the growth in defined contribution pension plans, the entry of China (with its love of gambling and speculative investment) and India into the world economy, or the growing number of affluent citizens in emerging economies more generally. More investors mean more people who will make mistakes and supply alpha to those who seek it. The second major trend is the introduction of a wider range of financial instruments (e.g., CDOs, derivatives, securities based on volatility, carbon credits, and longevity risk, or local currency emerging market bonds), which are often complex and difficult to value. This too increases the potential number of mistakes that will be made in the financial markets, and thus the potential supply of alpha. The third trend works against the other two, and has to do with the relationship between an investment manager's probability of making forecasting errors and the assets he or she is likely to have under management. If the managers likely to make big

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forecasting errors control substantial assets, that will generate a greater supply of potential alpha than if those managers control fewer assets. In their now classic 2002 paper ("Mutual Fund Flows and Performance in Rational Markets"), Berk and Green showed why the latter outcome is more likely to be the case, with the most skilled managers accumulating the most assets under management, and therebye reducing the supply of potential alpha, all else being equal.

The question remains as to how the interaction of these three trends will affect the supply of potential alpha in the years ahead, with attendant consequences for the likely returns from active management. On this point, the dismal historical track record of active managers' efforts to deliver higher than beta returns is certainly indicative of what may lie ahead.

In light of our analysis, we conclude that a prudent strategy for most investors has three key elements: (a) limit your overall allocation to active management, because of the relative shortage of alpha supply relative to demand under most market conditions, and the extreme difficulty of identifying managers with significant and sustainable skill; (b) focus your allocation to active management on uncorrelated alpha strategies, and avoid traditional "long only" active products that combine alpha and beta returns (while charging alpha prices for both); and (c) behave as a contrarian, and raise your chances of earning significant alpha returns by increasing your allocation to uncorrelated alpha strategies when markets are in their "downward excess" state.

Market Capitalization versus Fundamental Indexing: An Update

More than two years after we published our original analysis of fundamental and market capitalization based equity market indexing in July 2006, the controversy surrounding this issue has not abated. Hence, it is high time for an update.

Let's start with some definitions. Passive investors seek to earn the "skill-free" return from investing in an entire asset class at a very low cost. This skill free return is known by various names, including "systematic return", "market return" and "beta." The average return earned by all investors in an asset class is, by definition, equal to their individual returns weighted by the relative weight of their assets, as measured by those assets' market value.

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Note that this is true by definition, regardless of how accurately the market prices different assets. It is just as true in inefficient markets as it is in those that are perfectly efficient. Across all investors, returns (before investment management costs) above and below this average cancel each other out, leaving the market return. Hence, by definition, the only accurate way to measure the return earned by an investor who passively invests in equities is the market capitalization index return. This is therefore the correct return to use when, in the broadest sense, determining whether an individual investor has earned returns that are above or below the market average – so called positive and negative alpha returns.

Investors who hold positions that deviate from the market capitalization weighted index seek higher returns with higher risk, lower returns with lower risk, or higher returns with lower risk. The first two outcomes are logical and should persist over time; the latter represents an anomaly, and should only be available to those investors who possess superior forecasting skill. In turn, this superior skill must be based on some combination of superior information and/or a superior model that generates superior insight into the fundamental valuation of different assets and/or other investor's future behavior. To the extent that this superior skill can be translated into an algorithm (which, obviously, is most likely when superior insight is based on a superior model), it can be converted into an index and investment products can be sold that track that index at a relatively low cost. As this example makes clear, all investment strategies focused on earning only beta returns are index strategies; however, not all index strategies are focused solely on earning beta returns. On the contrary, in today's financial markets, more and more "index" products actually seek to deliver risk adjusted returns that are superior to those expected to be provided by beta alone.

So far, so good. Let us now move on to the question of the accuracy of stock prices as indicators of companies' fundamental or fair value. Efficient markets theory is based on a series of assumptions that are clearly not accurate descriptions of the real world. For example, all investors instantly get access to the same information, pay equal attention to it, have equal amounts of cognitive resources available to make sense of it, use the same purely rational analytical techniques, do not let emotions interfere with their judgment, and face the same portfolio constraints and transaction costs when translating their forecasts into actual investments. A growing number of papers have concluded that rather than a supremely rational system for valuing assets, financial markets are, in fact, complex adaptive systems

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whose normal state of affairs is disequilibrium (which implies less than perfectly accurate valuations) rather than equilibrium. See, for example, The Origin of Wealth, by Eric Beinhocker, "The Adaptive Markets Hypothesis" by Andrew Lo, "The Case for Market Inefficiency" by Bird, He, Thosar and Woolley, "Market Efficiency and Learning in an Artificial Stock Market: A Perspective from Neo-Austrian Economics" by Benink, Gordillo, Pardo and Stephens, "Experimental Study of Inequality and Unpredictability in an Artificial Cultural Market" by Salganik, Dodds and Watts, and multiple papers by Doyne Farmer, Blake LeBaron, Cars Hommes, Michael Mauboussin and the multitude of writers on "econophysics".

Moreover, another set of papers has repeatedly found that less than perfectly rational players (collectively known as "noise traders") can survive for long periods and have a significant impact on financial asset prices and returns. See, for example, "The Survival of Noise Traders in Financial Markets" by De Long, Shliefer, Summers and Walmann, "Do Noise Traders Move Markets?" by Barber, Odean and Zhu, "The Price Impact and Survival of Irrational Traders" by Kogan, Ross, Wang and Westerfield, "Asymmetric Information and Survival in Financial Markets" by Emanuela Sciubba, "Noise Trader Risk Exists" by Andrew Jackson, "Systematic Noise" by Barber, Odean and Zhu; "Does Noise Create the Size and Value Effects?" by Arnott, Hsu, Liu and Markowitz, and "Natural Selection in Financial Markets: Does It Work?" by Hongjun Yang. In sum, while financial markets are clearly attracted towards efficiency (e.g., the "Murphy's Law" of anomalies that generate above market return for below market risk is that once publicized, competition among active managers should rapidly reduce whatever efficacy they once had), they rarely attain it.

How large then, are the pricing inefficiencies created by the presence and survival of noise traders in markets? History shows that in as the time horizon lengthens, exponentially fewer active managers have been able to outperform an investment in a market capitalization weighted index fund. This would seem to imply that either the pricing errors created by the presence of noise traders are quite small, or that the people pursuing careers as active investment managers are singularly unsuited to that task. On balance, we think the former statement is much more likely to be true.

The discussion above describes the larger context in which we must evaluate the merits of fundamental indexing. Let's start with a definition of what it is: to create an index,

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the fundamental approach assigns weights to different stocks based not on their relative market capitalizations, but rather on some other indicator, such as their shares of aggregate revenues, earnings, or dividends paid. Make no mistake: this is an active strategy whose objective is to outperform the market (i.e., to capture alpha), not a new benchmark for measuring the performance of the equity asset class (i.e., a new way to define beta). It is easy to see why: if all equity investors switched to a single fundamental index, it would by definition become the market capitalization weighted index for the asset class and could not outperform itself.

Proponents of this approach seem to argue that, based on backtested results, by using fundamental indexing investors will probably realize higher returns with lower risks in comparison to a passive investment in a broadly defined, market capitalization weighted index, such as the Dow Jones Wilshire 5000. Implicit in this assertion are three assumptions: (a) it is possible to explain the investor errors that gave rise to fundamental indexing's superior risk adjusted returns in the past; (b) there are good reasons for believing that these mistakes will persist in the future; and (c) the benefits of a fundamental indexing strategy won't be more than offset by the trading costs and taxes it generates. Let us explore each of these in more detail.

The superior backtested performance of various fundamental index weighting schemes (e.g., revenues, book assets, earnings, dividends) implies that investors over the period measured systematically undervalued larger companies (as measured by the fundamental criteria) and systematically overvalued smaller companies. The interesting question is why this happened. With the smaller companies, the most likely answer is a very old story: the triumph of hope over experience. It has been well established by behavioral finance researchers that investors have predictable tendencies towards overoptimism with respect to future average returns, overconfidence with respect to the future variability of these returns (i.e., we tend to underestimate risk), and noticing and overweighting information which confirms our existing views. That investors have a tendency to overvalue companies that are smaller as measured by revenues, assets, dividends and earnings is really no surprise, and there are a growing number of alpha-seeking funds that attempt to exploit these mistakes (e.g., offerings from Fuller Thaler or LSV Asset Management).

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The more interesting question, in our view, is why investors apparently undervalued larger companies (as measured by the fundamental weighting criteria) over the backtested period. We have some educated guesses, including (a) an incorrect forecast of the impact of globalization on large company profit margins (many actually benefited, as labor and other cost savings more than offset more intense product market competition and pricing pressure); (b) an incorrect forecast of the extent to which larger firms would be able to maintain their competitiveness in the face of rapid change (some elephants, such as General Electric, have actually learned to dance quite well); and (c) an under-appreciation of the advantages conferred by shear size during a period of rapid change in the competitive environment (e.g., a greater ability to absorb and recover from unpleasant surprises).

However, how likely is it that investors will continue to make these same mistakes in the future, and thus allow stock selection and weighting strategies based on fundamental criteria to outperform broad market capitalization weighted indexes? That some investors will continue to overvalue smaller companies seems in little doubt. But it also seems likely that in some cases, limited liquidity in these stocks will make it hard for other investors (particularly those managing large sums of money) to profit from these errors. On the other hand, the assumptions that some investors will continue to undervalue larger companies (as measured by the fundamental weighting criteria), and that if they repeat, these errors won't be arbitraged away seem more doubtful in a world where large amounts of alpha-seeking money is managed using quantitative models whose specifications can be adjusted with a few strokes of a keyboard.

Last but not least, it is also the case that over time, the higher expenses charged by fundamental index products (.70% on PRF and .28% on DTD, versus .20% on TMW), and the higher trading volumes required to implement their strategies (with their associated costs and tax consequences) will further reduce their after tax returns relative to more efficient market capitalization based index products. In fact, there is evidence that competitive reaction and higher trading costs are already having a significant impact. Over the past twelve months, the broadest market capitalization index product in the United States (the TMW ETF, which tracks the Dow Jones Wilshire 5000) has returned (7.76%), while two popular fundamentally weighted products (PRF and DTD) have returned, respectively, (11.40%) and (10.81%). This is in stark contrast to the claims of fundamental indexing supporters, who have asserted that

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their approach should moderate losses in down markets, such as the one we are experiencing now. In sum, we believe that fundamental indexing is well on its way to proving yet again that in highly competitive global capital markets, free lunches are extremely hard to find and disappear quickly once the sources of information or models on which they are based become more widely understood.

For more technical criticisms of fundamental indexing, see "Fundamentally Active" by Robert Waid of Wilshire Associates, "Fundamentally Flawed Indexing" by Andre Perold from Harvard, and "Why Fundamental Indexation Might – or Might Not – Work", by Paul Kaplan from Ibbotson/Morningstar.

Product and Strategy Notes

More Evidence on Alpha Fees for Beta Returns

Philip Coggan (another of our favorite writers) has an excellent overview of the fund management industry in the February 28th edition of *The Economist*. Reading it made us realize how easy active managers had it in the days when quantitative techniques were in their infancy and the globalization of capital markets had not taken off. As Coggan makes clear, their jobs are getting a lot more challenging. One of the biggest reasons for this is the realization by more and more investors that they should not be paying alpha fees for a combination of alpha and beta returns, and that some types of alpha (e.g., strategies like value and small cap tilts, or foreign exchange and commodity trading rules that can be quantified and turned into index products) can be bought more cheaply than others (e.g., equity market neutral). Ross Miller's 2005 paper on this subject ("Measuring the True Cost of Active Management by Mutual Funds") is a classic treatment that remains one of our all-time favorites. In recent years, however, it has been joined by a growing number of others that reach similar conclusions about the extent to which investors have been either overpaying or overcharged (depending on your perspective) for what they've been getting from many players in the investment management industry.

A good example of these new studies is "Alpha Fees with Beta Returns" by Alexander and Luna. They study 3,140 Section 529 college savings plans in the United States and, after

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noting that only 26 of them generated statistically significant alpha, conclude that "529 consumers are offered inferior portfolios and pay alpha fees for beta returns." A more recent note from Watson Wyatt Australia ("A Fairer Deal on Fees") reached similar conclusions about the fees paid by defined benefit pension and superannuation (defined contribution) pension funds. They noted that "many pension funds have been paying alpha fees for beta performance, because the main driver of return in recent years has been the strength of the markets. This has encouraged investment managers to leverage their portfolios to boost returns, which means that investors are often paying for leveraged beta [not alpha]…Fees are currently too high for the value [active managers] deliver, particularly as we enter a lower return environment."

Finally, a new report from Wealth Management Exchange ("Managing Your Wealth Wisely: Six Proven Strategies") concludes that "many high net worth individuals feel that their advisors do a poor job of asset allocation and do not clearly benchmark and communicate to clients their respective performance statistics, and few advisors beat comparable indexes on a risk adjusted, after tax basis over the long run."

Those Who Fail to Learn From History

Many of the people who have written for our publications over the years started out as credit analysts. As we have discovered over the years, that tends to color your outlook. When everything goes right with a loan, you get your principal back with interest. The "potential upside to downside ratio" for people making loans is the inverse of what the one faced by people making equity investments. Hence credit people tend to be a rather skeptical, hard headed lot. At least they were once upon a time. In recent years, the debt markets have not only grown dramatically in size, but also undergone a fundamental change in the way they work. First came computers, which made old fashioned credit analysis (the kind you did with an annual report, a spreadsheet and a calculator) look like a Model-T Ford. Then came the development of derivative markets, which sharply reduced the information you could glean from a company's reported liabilities (when you can change a fixed rate dollar exposure to floating rate Euro with the click of a mouse, published statements don't tell you much about what is really going on). Then the trend towards increased reliance on intellectual rather than

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physical capital and the globalization of competition in many industries made the asset side of many balance sheets equally opaque. Finally, the development of valuation models and credit derivatives seemed to turn what had previously been regarded as an art into much more of a science. To be sure, people of a certain age (in our view, anybody who can tell you what the "5 Cs of Credit" are) were made increasingly uncomfortable in this environment. However, as has been the case in every credit crisis we've seen (LDC debt, commercial property, energy, etc.), the warnings of the grizzled credit veterans were not heeded by people whose upside for taking risks (or optimistically rating them) was a huge bonus, and whose downside was only the (most likely) temporary loss of their job. In the face of this asymmetry, wisdom went out the window, and the rest is history.

We have often thought that perhaps this would not have been the case had more interesting books been written about credit people. Unfortunately, they seem to make for much less interesting copy than traders, M+A and equity types. And so those who wish to learn from credit history must make do with the occasional research paper on this subject. Fortunately, two good ones have recently been published. The first is "The Crisis of 1873: Perspectives from Multiple Asset Classes" by Scott Mixon and the second is "Leveraged Losses: Lessons from the Mortgage Market Meltdown" by Greenlaw, Hatzius, Kashyap and Shin. Both make for interesting reading.

So too does another recent paper that, while not about credit, is about another subject that is equally critical. In "The Financial Psychology of Worry and Women" Victor Ricciardi provides an outstanding summation of a wide range of research in this area. It is an excellent and informative read.

New ETFs

As market observers know, more ETFs now seem to be launched each week in markets around the world. Most of them are simply cheaper ways to take different tilts in different asset classes. For investors who believe they possess superior forecasts, these products can be an inexpensive way to implement "long only" strategies that contain a mix of alpha and beta returns (or, for sophisticated players, to implement pure alpha strategies if they use derivatives to eliminate their exposure to beta returns). For people who lack such forecasting and trading

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skills, the new ETFs amount to a potentially dangerous temptation. What we pay attention to are new ETFs that appear to offer investors exposure to broadly defined asset classes or to "pre-packaged" uncorrelated alpha strategies. For example, we get excited about products like BWX (access to foreign currency bonds for U.S. investors) and DBV (access to an uncorrelated alpha strategy based on foreign exchange trading). We do not get excited about products that offer exposure to the emerging cat food products index, or similarly narrow tilts. With that in mind, let's take a quick look at some new ETFs that were recently launched. In the United States, Barclays iShares has launched two new products (IFGL and WPS) that track indexes covering non-U.S. commercial property. Their returns closely track those of the first ETF in this space, RWX from State Street. But for slightly cheaper expense ratios (.48% versus .60%) on RWX, these are essentially "me too" products. And why Barclays launched two of them must certainly be an interesting story, if anybody could explain it. Barclays also launched three other products, that offer regional exposure to commercial property markets in Asia (IFAS), Europe (IFEU) and North America (IFNA). These are potentially more interesting, given that the aggregate index is heavily weighted towards North America, since that is where the securitized commercial property market is (along with Australia) the oldest. So in theory, one could attempt to improve risk adjusted returns in this asset class by using the regional ETFs to create a more balanced portfolio, with greater diversification benefits.

However, as changes in regulations are already stimulating the growth of securitized property markets in Asia and Europe, the aggregate property index itself is gradually becoming more diversified. On balance, we would probably stick with an aggregate product and skip the additional costs that using the regional products would require. Meanwhile, in London Barclays iShares has launched new ETFs that track emerging market bonds and emerging markets infrastructure. In last month's issue, we explained why we are not big fans of either emerging market bonds (risks are too similar to emerging markets equity, and the latter has greater upside potential) or infrastructure (we think the political risks are significantly understated). The emerging market infrastructure ETF will allocate 40% of its portfolio to energy projects and 40% to utilities projects. In our past, we have had the pleasure of working out emerging market loans in both of these areas that went bad when governments disallowed price increases because of their political consequences. We are

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therefore not enthusiastic supporters of this product or any other that touts the investment attractions of emerging markets infrastructure.

Model Portfolios Year-to-Date Nominal Returns

We offer over 2,000 model portfolio solutions for subscribers whose functional currencies (that is, the currency in which their target income and bequest/savings are denominated) include Australian, Canadian, and U.S. Dollars, Euro, Yen, Pounds-Sterling, Swiss Francs and Indian Rupees. In addition to currency, each solution is based on input values for three other variables:

- The target annual income an investor wants her or his portfolio to produce, expressed as a percentage of the starting capital. There are eight options for this input, ranging from 3 to 10 percent.

- The investor's desired savings and/or bequest goal. This is defined as the multiple of starting capital that one wants to end up with at the end of the chosen expected life. There are five options for this input, ranging from zero (effectively equivalent to converting one's starting capital into a self-managed annuity) to two.

- The investor's expected remaining years of life. There are nine possible values for this input, ranging from 10 to 50 years.

We use a simulation optimization process to produce our model portfolio solutions. A detailed explanation of this methodology can be found on our website. To briefly summarize its key points, in order to limit the impact of estimation error, our assumptions about future asset class rates of return, risk, and correlation are based on a combination of historical data and the outputs of a forward looking asset pricing model. For the same reason, we also constrain the maximum weight that can be given to certain asset classes in a portfolio. These maximums include 30% for foreign equities, 20% for foreign bonds, domestic and foreign commercial property, and commodities (including a sub-limit of 10% on timber), and 10% for

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emerging markets equities. There are no limits on the weight that can be given to real return and domestic bonds, and to domestic equities.

Each model portfolio solution includes the following information: (a) The minimum real (after inflation) internal rate of return the portfolio must earn in order to achieve the specified income and savings/bequest objectives over the specified expected lifetime. (b) The long-term asset allocation strategy that will maximize the probability of achieving this return, given our assumptions and constraints. (c) The recommended rebalancing strategy for the portfolio. And (d) the probability that the solution will achieve the specified income and savings/bequest goals over the specified time frame.

We use two benchmarks to measure the performance of our model portfolios. The first is cash, which we define as the yield on a one year government security purchased on the last trading day of the previous year. For 2008, our U.S. cash benchmark is 3.97% (in nominal terms). The second benchmark we use is a portfolio equally allocated between the ten asset classes we use (it does not include equity market neutral). This portfolio assumes that an investor believes it is not possible to forecast the risk or return of any asset class. While we disagree with that assumption, it is an intellectually honest benchmark for our model portfolios' results.

The year-to-date nominal returns for all these model portfolios can be found here: http://www.retiredinvestor.com/Members/Portfolio/USA.php

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