The Index Investor

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This Month's Issue: Key Points

Our first article this month examines the often confusing subject of foreign currency exposure – is it a risk to be hedged (and if so, to what extent and how), or a potential source of uncorrelated alpha produced by active managers? We conclude that it is both. However, deciding on the extent to which one should hedge the foreign currency exposure inherent in passive investments in foreign bonds, property and equity is far from easy; in fact, there is no single right answer. Moreover, retail investors face challenges in implementing a decision to hedge a portion of their foreign currency exposure. Finally, while historically a rich source of active returns, in the future, currency alphas may decline as more and more investors pursue them.

Our second article examines whole life insurance, and whether (because it contains exposure to and active management of mortality risk) it might also be another source of uncorrelated alpha. We find that, at least in the case of Northwestern Mutual Whole Life policies, this appears to be the case. Finally, our product and strategy notes cover interesting

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new research papers (including more proof that forecasting to an accuracy level beyond luck is both hard and rare), and new products that have attracted our attention (including a new managed futures uncorrelated alpha product from Rydex).

This Month's Letters to the Editor

Regarding your May issue, isn't predicting a crash just another form of timing the market? Haven't you lectured against that?

As we have noted in the past, we have a mixed view of attempts to time markets, by which we means varying the asset class weights in a portfolio after they have initially been set. We distinguish between four types of market timing, depending upon whether their objective is to earn higher return or reduce risk, and whether they are undertaken systematically or episodically. Systematic market timing most often takes the form of a regular rebalancing strategy. Rebalancing back to target weights based on some criterion (e.g., the passage of time, or one asset class hitting a "trigger level" above or below its target weight) is intended to limit risk. In some of our model portfolios, we also incorporate a second approach (rebalancing the most overweight asset class to below its target weight, and the most underweight asset class to above its target weight) that is intended to add incremental returns by exploiting markets' tendency to overreact and then mean revert. An alternative systematic market timing approach whose goal is higher returns could take the form of a tactical asset allocation strategy that alters asset class weights (e.g., within a range defined by the target weight plus or minus 5%) based on some systematic calculation (e.g., recent trend compared to a moving average, or relative valuation indicators).

Episodic market timing does not happen automatically according to a predetermined decision rule; rather, it is undertaken based on an investor's consideration of a number of situational factors, and the conclusion they imply about relative asset class valuations or the level of systematic risk and fragility present in the global economy and financial system. Again, the primary objective of episodic market timing can be either higher returns or lower risk. In our view, given the overwhelming evidence that relative returns are less stable over

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time (and therefore more difficult to forecast) than risk, we believe that episodic market timing efforts are best focused on the latter. Specifically, when pursuing multiperiod investment objectives (e.g., funding a liability or not running out of money while meeting a bequest target), avoiding large losses is arguably more important that reaching for the last 50 basis points of return (since the exposure to downside risk typically increase more quickly than the incremental expected return).

We recognize that what we wrote in our May 2007 issue violated our general policy of diversifying across a wide range of asset classes and following a systematic rebalancing strategy. We tried to emphasize the point that this policy was predicated on an assumption of relatively normal economic and market conditions and that what we fear is on the horizon is a multi-standard deviation event that formed the basis for our episodic market timing conclusion. A large number of readers wrote to us; some agreed and some didn't – but most appreciated our willingness to make a clear call. As one reader from the U.K. wrote, "At 63 my time line means I no longer have a comfortable 10 to 15 years to recover serious asset erosion. I'll take satisfactory gains now, thank you, batten down the hatches and be ready to ride out whatever storm materialises. What serious upside potential might I miss? Of course I'm retaining some very good assets in various classes and my cash will undoubtedly buy some much better deals down the road and allow a better re-allocation into the bargain. And if I'm wrong? Well, my investment journey will continue peacefully in sunshine and I'll be ready for new opportunities, well rested, because I'll have slept less fitfully!"

On the other hand, a reader from Germany wrote to say that "When markets make radical moves, investors demonstrate either the courage or the cowardice of their convictions"…However, I still believe that long term asset allocation is more promising than short term market timing…and it is prudent to stay invested." As we wrote last month, we did not make our recommendations lightly, nor did we expect them to be non-controversial. But, to get back to your question, we do believe there are circumstances under which episodic marketing timing is justified, and that this is one of them.

Looking for other views, I found the IMF's most recent semi-annual Global Financial Stability Report (GFSR) dated April 2007. The report mentions all of your concerns (I think) and concludes "while the downside risk from a possible disorderly unwinding of global

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imbalances has receded somewhat, it remains a concern." I hope the GFSR is included in your reading.

It certainly was. We also highly recommend Miranda Xafa's IMF Working Paper titled "Global Imbalances and Financial Stability"for an excellent overview of the arguments on both sides of this issue (available at: www.imf.org/external/pubs/ft/wp/2007/wp07111.pdf). And we agree that, with respect to the timing of the major global correction we see as the inevitable result of many trends underway in the world today, there are, to quote former U.S. Treasury Secretary Lawrence Summers, a lot of "chastened prophets" who expected said correction to have occurred well before June 2007. That being said, the evidence in favor of an eventual severe correction is also out there – to cite but two examples, the world's central banks are now financing a very large portion of the U.S. current account deficit, as private investors (and indeed, some central banks) have begun to diversify their holdings away from the U.S. dollar. In this regard, the timing of the eventual correction has become as much a strategic political decision as an economic one. Moreover, we need look no further than Japan for evidence that severe corrections can produce prolonged and very painful economic slumps (which, if said slump occurred in the United States, might work to the long-term strategic (if not short term economic) benefit of some of the countries now financing its deficit). As we said, given these circumstances, we believe that the most prudent course of action is to leave the party a bit early, rather than staying to the bitter end.

Given that market timing is a wash, how do we manage a move to all cash? Do we stay out of the market indefinitely? I do not doubt the thinking in the May 2007 edition, but it does lead to some difficult questions. What about the use of structured products to protect against loss but continue with market involvement? Wouldn't this solve the problem for the near future?

There is undoubtedly a happy medium between moving more into cash (e.g., by reducing exposure to particularly overvalued asset classes like equity and probably property) and other defensive investments (e.g., timber; and unhedged foreign currency bonds for U.S. dollar based investors) and using structured products (e.g., buying and rolling forward equity index puts) to accomplish the same ends. In our view (and this comes from someone who started

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buying equity puts in late 1998), while cash is definitive, it leaves open the question of when to get back into an asset class (e.g., when the valuations appear more reasonable). On the other hand, while structured products avoid that decision, the prolonged cash outflows they require can generate a lot of second guessing and sometimes cause investors to "throw in the towel" and abandon the hedge just before the anticipated (and inevitably delayed) correction finally occurs. We don't think there is any single right answer to this tradeoff – but structured products are clearly an option.

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Global Asset Class Returns

YTD 31May07	**In USD**	**In AUD**	**In CAD**	**In EURO**	**In JPY**	**In GBP**	**In CHF**	**In INR**
Asset Held								
US Bonds	1.16%	-3.68%	-7.91%	-0.78%	3.47%	0.14%	1.70%	-7.48%
US Prop	3.23%	-1.61%	-5.84%	1.29%	5.54%	2.21%	3.77%	-5.41%
US Equity	9.30%	4.46%	0.23%	7.36%	11.61%	8.28%	9.84%	0.66%
AUS Bonds	4.18%	-0.66%	-4.89%	2.24%	6.49%	3.16%	4.72%	-4.46%
AUS Prop	8.71%	3.87%	-0.36%	6.77%	11.01%	7.68%	9.24%	0.07%
AUS Equity	15.28%	10.44%	6.21%	13.34%	17.59%	14.26%	15.81%	6.64%
CAN Bonds	5.40%	0.56%	-3.67%	3.46%	7.71%	4.38%	5.93%	-3.24%
CAN Prop	16.96%	12.12%	7.89%	15.02%	19.27%	15.94%	17.50%	8.32%
CAN Equity	11.76%	6.92%	2.69%	9.82%	14.07%	10.74%	12.30%	3.12%
Euro Bonds	-2.38%	-7.22%	-11.45%	-4.32%	-0.07%	-3.40%	-1.84%	-11.02%
Euro Prop.	6.66%	1.82%	-2.41%	4.72%	8.97%	5.64%	7.20%	-1.98%
Euro Equity	11.27%	6.44%	2.20%	9.34%	13.58%	10.25%	11.81%	2.64%
Japan Bnds	-3.19%	-8.03%	-12.26%	-5.13%	-0.88%	-4.21%	-2.65%	-11.83%
Japan Prop	23.40%	18.56%	14.33%	21.46%	25.71%	22.38%	23.94%	14.76%
Japan Eqty	0.49%	-4.34%	-8.58%	-1.44%	2.80%	-0.53%	1.03%	-8.14%
UK Bonds	-3.26%	-8.10%	-12.33%	-5.20%	-0.96%	-4.29%	-2.73%	-11.90%
UK Prop.	-9.14%	-13.98%	-18.21%	-11.08%	-6.83%	-10.16%	-8.60%	-17.78%
UK Equity	6.15%	1.31%	-2.92%	4.21%	8.46%	5.13%	6.69%	-2.49%
World Bnds	0.89%	-3.95%	-8.18%	-1.05%	3.19%	-0.14%	1.42%	-7.75%
World Prop.	8.26%	3.42%	-0.81%	6.32%	10.57%	7.24%	8.80%	-0.38%
World Eqty	10.28%	5.44%	1.21%	8.34%	12.59%	9.26%	10.82%	1.64%
Commod	5.33%	0.50%	-3.73%	3.40%	7.64%	4.31%	5.87%	-3.30%
Timber	8.10%	3.27%	-0.97%	6.17%	10.41%	7.08%	8.64%	-0.54%
EqMktNtrl	3.84%	-1.00%	-5.23%	1.90%	6.15%	2.81%	4.37%	-4.80%
Volatility	12.89%	8.05%	3.82%	10.95%	15.20%	11.87%	13.43%	4.25%
Currency								
AUD	4.84%	0.00%	-4.23%	2.90%	7.15%	3.81%	5.37%	-3.80%
CAD	9.07%	4.23%	0.00%	7.13%	11.38%	8.05%	9.61%	0.43%
EUR	1.94%	-2.90%	-7.13%	0.00%	4.25%	0.92%	2.47%	-6.70%
JPY	-2.31%	-7.15%	-11.38%	-4.25%	0.00%	-3.33%	-1.77%	-10.95%
GBP	1.02%	-3.81%	-8.05%	-0.92%	3.33%	0.00%	1.56%	-7.62%
USD	0.00%	-4.84%	-9.07%	-1.94%	2.31%	-1.02%	0.54%	-8.64%
CHF	-0.54%	-5.37%	-9.61%	-2.47%	1.77%	-1.56%	0.00%	-9.17%
INR	8.64%	3.80%	-0.43%	6.70%	10.95%	7.62%	9.17%	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 31May07

Australia	**Low Demanded Return**	**High Demanded Return**
High Supplied Return	82%	120%

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Low Supplied Return	124%	168%

Canada	**Low Demanded Return**	**High Demanded Return**
High Supplied Return	107%	171%
Low Supplied Return	193%	276%

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Eurozone	**Low Demanded Return**	**High Demanded Return**
High Supplied Return	85%	130%
Low Supplied Return	137%	191%

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Japan	**Low Demanded Return**	**High Demanded Return**
High Supplied Return	98%	188%
Low Supplied Return	230%	361%

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United Kingdom	**Low Demanded Return**	**High Demanded Return**
High Supplied Return	64%	107%
Low Supplied Return	109%	160%

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United States	**Low Demanded Return**	**High Demanded Return**
High Supplied Return	133%	199%
Low Supplied Return	230%	316%

Switzerland	**Low Demanded Return**	**High Demanded Return**
High Supplied Return	105%	158%
Low Supplied Return	173%	314%

India	**Low Demanded Return**	**High Demanded Return**
High Supplied Return	112%	199%
Low Supplied Return	246%	371%

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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 31May07

	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	2.79%	2.96%	5.75%	6.02%	0.27%	-2.48%
Canada	1.99%	2.40%	4.39%	4.48%	0.09%	-0.85%
Eurozone	2.32%	2.37%	4.69%	4.41%	-0.28%	2.68%
Japan	1.12%	0.77%	1.89%	1.76%	-0.13%	1.30%
UK	1.72%	3.17%	4.89%	5.25%	0.36%	-3.39%
USA	2.52%	2.93%	5.45%	4.90%	-0.55%	5.37%
Switz.	2.49%	2.03%	4.52%	3.09%	-1.43%	14.77%
India	2.43%	7.57%	10.00%	8.13%	-1.87%	18.70%

*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

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generally increase. Theoretically, the "natural" or equilibrium real rate of interest is a function of three variables: (1) the expected rate of multifactor productivity growth (as it increases, so 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. The real rate formula is [Time Discount Rate + ((1/Risk Aversion Factor) x MFP Growth)].

Real Interest Rate Analysis at 31May07

Real Rate Analysis	AUD	CAD	EUR	JPY	GBP	USD
Risk Aversion Factor	4.0	5.0	4.0	6.0	5.5	4.0
Time Discount Rate	2.25%	1.75%	2.00%	1.00%	1.50%	2.25%
MFP Growth	1.60%	1.20%	1.40%	0.60%	1.40%	1.40%
Theoretical Real Rate	2.65%	1.99%	2.35%	1.10%	1.75%	2.60%
Real Rate	2.79%	1.99%	2.32%	1.12%	1.72%	2.52%

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

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else being equal, this would reduce any estimated overvaluation or increase any estimated undervaluation. For example, if one were to assume a very different scenario, involving a prolonged recession, accompanied by deflation, then one could argue that government bond markets are actually undervalued today.

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

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

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

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Avg. +/- 2 SD	1.91% - .03%	1.93% - .23%

At 31 May 2007, the AAA minus 10 year Treasury spread was .67%. This is still below the long-term average compensation for bearing liquidity and jump risk (assuming our model is correct).

At the end of the month, the BBB minus AAA spread was .93%. This is also below the long-term average compensation for bearing credit risk. Given other developments underway in the world economy, we believe that it is more likely that credit risk is underestimated rather than overestimated today, and that corporate bonds are 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. 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. This information is summarized in the following table:

Annual Exchange Rate Changes Implied by Bond Market Yields on 31May07

	To AUD	**To CAD**	**To EUR**	**To JPY**	**To GBP**	**To USD**	**To CHF**	**To INR**
From								
AUD	0.00%	-1.54%	-1.61%	-4.26%	-0.77%	-1.12%	-2.93%	2.11%
CAD	1.54%	0.00%	-0.07%	-2.72%	0.77%	0.42%	-1.39%	3.65%
EUR	1.61%	0.07%	0.00%	-2.65%	0.84%	0.49%	-1.32%	3.72%
JPY	4.26%	2.72%	2.65%	0.00%	3.49%	3.14%	1.33%	6.37%
GBP	0.77%	-0.77%	-0.84%	-3.49%	0.00%	-0.35%	-2.16%	2.88%
USD	1.12%	-0.42%	-0.49%	-3.14%	0.35%	0.00%	-1.81%	3.23%
CHF	2.93%	1.39%	1.32%	-1.33%	2.16%	1.81%	0.00%	5.04%
INR	-2.11%	-3.65%	-3.72%	-6.37%	-2.88%	-3.23%	-5.04%	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

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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:

Commercial Property Securities Analysis as of 31May07

Country	Real Bond Yield	Plus Commercial Property Risk Premium	Less Dividend Yield on Commercial Property Securities	Equals Expected Rate of Future Real Dividend Growth
Australia	2.79%	2.50%	5.2%	0.1%
Canada	1.99%	2.50%	3.9%	0.6%
Eurozone	2.32%	2.50%	2.3%	2.6%
Japan	1.12%	2.50%	1.1%	2.5%
Switzerland	2.49%	2.50%	3.5%	1.5%
United Kingdom	1.72%	2.50%	2.0%	2.2%
United States	2.52%	2.50%	3.8%	1.3%

If you think the 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 too optimistic (Australia and perhaps Canada excepted), and therefore to believe that the balance of business cycle and valuation evidence suggests that commercial property securities in many markets are probably 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 31 May 2007 closing value of 172.72 was about

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3.0 standard deviations above the 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). Given this, the probability of a near term decline in the spot price of the DJAIG still seems much higher than the probability of an 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). As is the case with equities, 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. A number of factors contribute to the expected future growth rate of timber REIT dividends. These are listed in the following table, along with the assumptions we make about their future values:

Growth Driver	**Assumption**
Biological growth of trees	While this varies according to the maturity a given timber property, we assume 6% as the long term average.
Change in prices of timber and land on which the trees are growing	We assume that over the long term they just keep pace with inflation. Hence, their contribution to the real growth rate is zero.

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

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

Given these assumptions, our assessment of the valuation of the timber asset class at 31 May 2007 is as follows:

1. Forecast supplied return = 4.20% (Div Yld) + 6.00% (Long Term Growth) = 10.20%
2. Return demanded = 2.52% (Real Bond Yield) + 4.00% (Risk Premium) = 6.52%
3. Return Demanded/Return Supplied = 64%
4. Conclusion: Timber is undervalued today.

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.

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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 31 May 2007, the VIX closed at 13.05. This is one standard deviation below the VIX's long term average value. This level strikes us as very low in light of rising uncertainty in the world economy and financial markets. Hence, we conclude that equity volatility is likely 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

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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 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. Unfortunately, at the end of April, they seem as uncertain as everyone else.

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

Rolling 3 Month Returns Through	***31May07***			
Economy	Bottoming	Strengthening	Peaking	Weakening
Interest Rates	Falling	Bottom	Rising	Peak
Style and Size Rotation	Small Growth (DSG) **9.71%**	Small Value (DSV) **7.45%**	Large Value (ELV) **9.55%**	Large Growth (ELG) **8.37%**
Sector Rotation	Cyclicals (IYC) **5.08%** Technology (IYW) **9.75%**	Basic Materials (IYM) **12.24%** Industrials (IYJ) **20.85%**	Energy (IYE) **20.07%** Staples (IYK) **6.97%**	Utilities (IDU) **9.50%** Financials (IYF) **4.88%**
Bond Market Rotation	Higher Risk (LQD) **-1.47%**	Short Maturity (SHY) **0.33%**	Low Risk (TIP) **-1.52%**	Long Maturity (TLT) **-3.44%**

The next tables describe the typical cycles in the markets for commercial property and commodities. We believe they should be read in conjunction with current situation in the bond market. However, rather than being leading indicators of future economic conditions, commercial property and commodity market returns tend to coincide with current economic and interest rate conditions (i.e., those at the top of the same column, rather than the next one to the right). When many investors share the same expectations about future economic conditions, one would expect to see alignment between bond and equity market year-to-date returns, and conditions in commodity and commercial property markets. However, we also note that this is when markets are most fragile; large moves can occur if something happens to change these closely aligned expectations. In contrast, when investors do not share the same expectations for the future, you would expect to see misalignment between year-to-date returns in bond, equity, commodity and commercial property markets.

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Economy	Bottoming	Strengthening	Peaking	Weakening
Interest Rates	Falling	Bottom	Rising	Peak
Commodities				
Commodity Inventories	Peaking	Falling	Bottoming	Rising
Spot Prices	Bottoming	Rising	Peaking	Falling
Futures Prices Relative to Spot Price	Contango (futures higher than spot)	Uncertain	Backwardation (futures lower than spot)	Uncertain
Profitability of long commodity futures position, before diversification and collateral yields	Negative (falling spot and negative roll yield)	Uncertain (rising spot, uncertain roll yield)	Positive (rising spot and positive roll yield)	Uncertain (falling spot, uncertain roll yield)
Comm'l Property				
Commercial Property Vacancy Rates	Peaking	Falling	Bottoming	Rising
Rents	Low	Rising	High	Falling
New Construction Completion (space coming onto the market)	Falling	Bottoming	Rising	Peaking
Property Valuation Ratios	Bottoming	Rising	Peaking	Falling
Expected Future Property Returns	Peaking	Falling	Bottoming	Rising

The following table sums up our subjective view of possible asset class under and overvaluations at the end of May 2007. The distinction between possible, likely and probable reflects a rising degree of confidence in our conclusion.

Probably Overvalued	Commodities, Corporate Bonds
Likely Overvalued	Commercial Property, Equity Markets
Possibly Overvalued	
Possibly Undervalued	Australian and U.K. Bond Markets
Likely Undervalued	Equity Volatility
Probably Undervalued	Non-U.S. Dollar Bonds; Timber

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Currency Exposure: A Risk to Be Hedged, a Source of Uncorrelated Returns, or Both?

As evidenced by the number of articles published and new products introduced, investors' interest in foreign exchange has been rising over the past year. This article will review some basic concepts and then address these key questions: (1) How is foreign exchange risk related to other investment risks? (2) Do investors receive adequate compensation for bearing this risk? (3) How should this risk be managed? And (4) can foreign exchange be a source of uncorrelated active returns?

The modern history of the foreign exchange market began in 1944 at the Mount Washington Hotel in Bretton Woods, New Hampshire, USA. It was there that delegates to the United Nations Monetary and Financial Conference agreed upon a system to govern post World War Two foreign exchange markets. Each nation would commit to adjusting its monetary policy so as to maintain the value of its currency versus gold, within a band of plus or minus 1%. With the United States the dominant trading power in the post-war world, the system evolved into one in which other countries pegged their currency's value to the U.S. dollar, which was exchangeable for gold. Under pressure from U.S. fiscal and current account strains brought on by the "guns and butter" policy of the Vietnam War era, the Bretton Woods System collapsed in 1971 when the United States suspended the convertibility of the U.S. dollar into gold. Since then, the world payments system has featured a combination of floating exchange rates (between the major currencies) and de facto fixed or semi-fixed rates (maintained by many countries versus one of the major currencies – e.g., the U.S. dollar in the case of many Asian countries). The launch of the Euro as a cash currency in 2002 marked another watershed event in the history of the post-war monetary system, as for the first time the U.S. dollar faced a serious competitor. By the end of December 2006, the value of Euro cash in circulation had surpassed the value of outstanding U.S. dollars; however, in terms of the total value of financial instruments denominated in each currency, the dollar continued to have a large, if falling, lead.

In theory, prices in a floating foreign exchange market (i.e., exchange rates) should change to reflect changes in the real economy and monetary conditions. Consider two countries, "Home" and "Foreign". They both have 100 units of their currency outstanding,

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and each produce 100 widgets. An exchange rate of 1 Home per 1 Foreign makes purchasing power equal in each country. Now consider what happens when scientists in Home develop a new process that allows 200 widgets to be produced with the same amount of inputs. The increase in Home's productivity has led to a substantial increase in its citizens' purchasing power relative to the purchasing power enjoyed by Foreign citizens. To equalize purchasing power between the two countries, Home's currency must appreciate in value (to H .50 per F 1.00) or, viewed from the opposite perspective, Foreign's currency must depreciate to offset its lower productivity.

Now let us consider another example. Once again, Home and Foreign both have 100 units of currency outstanding and each produces 100 widgets. Now let us assume that Foreign prints another 100 units of its currency, so that 200 are outstanding. It now costs 2 Foreign Currency units to buy a widget, versus 1 Home currency unit. If the exchange rate doesn't change, Foreign citizens would rush to exchange their Foreign Currency to buy Home Currency and buy widgets made in Home. In a freely floating foreign exchange market, this should bid up the price of one unit of Home Currency to two units of Foreign Currency. In this case, the country with higher inflation (Foreign) saw its currency depreciate versus the country with low inflation (or, viewed the opposite way, the country with low inflation saw its currency appreciate versus the high inflation country).

Differences in productivity and inflation both contribute to observed differences in two countries' nominal interest rates (e.g., as measured by differences between the yields on ten year government bonds). Over time, the country with a higher interest rate should see its currency depreciate versus a country with a lower rate.

In real life, however, the foreign exchange market is less efficient than these examples suggest; adjustments to different levels of productivity, inflation and interest rates do not happen quickly. The main reason for this is that a lot of foreign exchange is traded by people whose primary motive isn't necessarily maximizing their profit. For example, tourists need to exchange currency when they go on a trip, and businesses need to pay for purchases. Perhaps most importantly, Central Banks frequently trade in foreign exchange markets to keep their currencies in a target range, even if it means they lose money. The presence of these "non-profit maximizing" players means that the world's most liquid market (with almost US $2

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billion traded daily) is a less efficient one than the markets for bonds and equities, which are dominated by investors seeking to maximize risk adjusted returns.

Our example also helps to clarify the confusing question of whether foreign exchange is a separate asset class. Strictly speaking, the answer is "no." As we use the term, assets have future streams of risky cash flows that can be discounted at an appropriate rate to obtain the asset's value. In contrast, foreign exchange is a price at which two currencies can be exchanged. In addition, while it is possible for investors in aggregate to lose money when an overvalued asset class crashes, the same cannot be said for foreign exchange, where every investment position in a currency that declines in value is, by definition, offset by an appreciating position in the other currency. Thus, it is more accurate to talk of foreign exchange exposures rather than foreign exchange as an asset class. But nothing is that simple is it? Confusion can easily arise when an investor converts her home currency into a foreign currency and deposits that in a foreign bank. While said investor may say she is holding foreign currency as an asset class, in reality the asset class she is holding is cash. Because that cash is denominated in a foreign currency, she also has a foreign exchange exposure in her portfolio.

This example highlights another key point: over a given period of time, the return on an investment denominated in something other than an investor's home currency equals the foreign currency return plus the change in the exchange rate between the two currencies. To put it slightly differently, the total return on a foreign investment is compensation for bearing some combination of investment and foreign currency risk. In turn, this raises a critical question: how are these risks related? If they have a high correlation over some time period (e.g., losses on a foreign exchange exposure tend to occur at the same time the foreign currency investment is declining in value), then an investor would require a higher return premium than if their correlation was low or negative. In practice, this question is easier to ask than it is to answer.

Let's start with the correlations of real returns between different currencies (expressed in terms of changes in their exchange rate versus the U.S. dollar) and five broad asset class classes (whose returns were calculated in U.S. dollars, with no hedging of foreign exchange exposure), between the first quarter of 1994 and the last quarter of 2004, shown in the table

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below. The last line of the table shows each asset's annualized standard deviation of real U.S. dollar returns (volatility).

	USD /AUD	USD /CAD	USD /EUR	USD /JPY	USD /GBP	USD /CHF	Global Bonds	Global Property Securities	Commodities (DJAIG)	Timberland	Global Equity
USD/AUD	1.00										
USD/CAD	**.66**	1.00									
USD/EUR	.35	.27	1.00								
USD/JPY	.15	.15	.45	1.00							
USD/GBP	.28	.22	**.68**	.38	1.00						
USD/CHF	.16	.12	**.89**	.50	.51	1.0					
Global Bonds	.07	.10	**.80**	.49	**.61**	**.75**	1.0				
Global Property	**.53**	**.65**	.06	.18	.20	(.03)	.07	1.0			
Commodities	.30	.15	.03	(.03)	.16	(.03)	(.07)	.18	1.0		
Timberland	(.10)	(.08)	.01	.12	.21	(.03)	.12	(.06)	.02	1.0	
Global Equity	.42	.44	(.11)	.19	.06	(.17)	(.05)	.57	(.09)	.24	1.0
Annualized Volatility	10.9%	6.2%	9.3%	13.1%	6.4%	11.0%	7.0%	15.3%	12.2%	5.3%	17.3%

As you can see, in general, exchange rate movements were not highly correlated with real returns on different asset classes, or, indeed, with each other. These low correlations suggest that completely hedging away these foreign currency exposures would have been suboptimal. To be sure, there were some exceptions, where correlations were sufficiently high to suggest that a fairly high degree of foreign exposure hedging would have made sense (at least in hindsight). As you can see in the table, Australian and Canadian exchange rates had a relatively high correlation over the period studied, perhaps because both economies are strongly dependent on commodity exports. Also, it is clear that the U.K. Pound and Swiss Franc have a tendency to track the Euro, or at least react to common supply and demand forces. In terms of asset classes, Global Bond returns had the highest correlation with exchange rate changes, particularly with regard to the three European currencies. The relatively high correlation between returns on Global Property Securities and the Australian and Canadian dollars reflects the relatively high weight of property securities from these two nations in the global index over the period studied (which will not be the case in the future, as

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more countries, such as the U.K., implement reforms to increase the size of their securitized property sector). In sum, the main message from this table is that, over the Q1 1994 to Q4 2004 period, foreign exchange exposure tended to provide diversification benefits with respect to investments in a range of global asset classes made by investors with different functional (home) currencies. With the benefit of hindsight, it is clear that in all cases (though to varying degrees), completely hedging away foreign exchange risk exposure when making these foreign investments would have been suboptimal.

However, it is critical to note that finding this was true over some period in the past is no guarantee that it will also be true in the future. For example, changes to relative rates of productivity growth and inflation can and do alter correlations between exchange rates and asset class returns. Statistically, these relationships are said to be "non-stationary." In layman's terms, we can say they are uncertain, in the sense that while the range of possible outcomes is known, their associated probabilities are not.

This raises the next logical question: have investors been adequately compensated for bearing the uncertainty inherent in their foreign exchange exposures (while also recognizing that in the past, these exposures have also provided diversification benefits)? Once again, this is not an easy question to answer, and more than one argument can be offered.

At one extreme is the position that, since the long-term return on a foreign currency exposure is theoretically zero (since any temporary departures from equilibrium exchange rates will eventually be arbitraged away), an investor will receive no compensation for bearing the associated risk and uncertainty. At the other extreme (call it the "yes, but" response), there is the argument that (a) you can't ignore the value of the diversification benefits provided by many foreign exchange exposures, (b) since foreign exchange markets can remain out of equilibrium for prolonged periods, positive returns can and are achieved from holding these exposures in a portfolio (of course, so are negative ones if you are on the other side of these positions); and (c) hedging away foreign exchange exposure involves real costs that grow over time, including transaction fees and cash margin calls (when forward or futures contracts are used). For example, consider the following table, which covers real U.S. dollar returns between the first quarter of 1994 and the last quarter of 2004:

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Asset or Exposure	Annualized Return	Annualized Volatility	Return/Volatility
Australian Dollars	1.2%	10.9%	.11
Canadian Dollars	0.9%	6.2%	.14
Euro	1.8%	9.3%	.19
Yen	0.4%	13.1%	.03
U.K. Pounds	2.4%	6.4%	.38
Swiss Francs	2.9%	11.0%	.26
Global Bonds	4.1%	7.0%	.59
Global Property	6.6%	15.3%	.43
Commodities	6.4%	12.2%	.52
Timber	6.0%	5.3%	1.13
Global Equity	6.9%	17.3%	.40

As you can see, over this period, a U.S. dollar based investor received a positive premium, (in addition to diversification benefits) for bearing the uncertainty associated with foreign exchange exposures. Of course, the parties on the other side of these exposures earned negative returns.

Finally, we should also consider foreign exchange exposures from the perspective of risk budgeting. As readers recall (for more on this, see our July 2006 issue), risk budgeting looks at the contribution to total portfolio risk made by a given asset class or exposure, taking both its volatility and diversification benefits (correlations) into account. This approach seeks to maximize returns for a given level of risk by allocating that risk between passive asset class investments (beta risk and return) and actively managed investments (alpha risk and return). In a risk budgeting framework, there are two aspects to an investor's foreign exchange exposure. The first is passive, and is defined by the amount of foreign exchange exposure created by passive investments (e.g., in foreign bonds, property and equities) that is retained (or, from the other perspective, that is hedged away). The second is active, and treats active currency trading as one of many potential sources of alpha. In the risk budgeting context, the key point is that foreign exchange exposures can eat up a significant portion of an investor's risk budget. For example, consider a portfolio in which a U.S. dollar based investor allocates 10% each to real return bonds, domestic bonds, foreign currency bonds, domestic property securities, foreign property securities, commodities, timber, domestic equity, foreign equity (EAFE Index) and emerging markets equity. Based on the 1994 to 2004 data we have used throughout this article, the foreign bond, property and equity exposures used up about 46% of

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the risk budget (we have left emerging markets out of this to simplify the foreign currency calculations). Of that 46%, about 17% represents the risk budget used by foreign currency exposures (assuming that exposure consists of 4% to the Australian Dollar, 7% to the Canadian Dollar, 34% to the Euro, 24% each to the Yen and U.K. Pound, and 7% to the Swiss Franc – which is based on the approach used by CALPERS -- the California Public Employees Retirement System -- in its hedging calculations). The key issue raised by the risk budgeting methodology is whether the additional costs that would be incurred to hedge foreign currency exposure away are forecast to be less than the additional returns that are forecast to be earned by reallocating some of this risk to alternative uses (e.g., a larger passive position or an allocation to actively managed investments). Unfortunately, there is no right answer to this question, as the answer is based on forecasts made in the face of uncertainty.

A last, and critical, issue with respect to the net compensation an investor receives for bearing foreign exchange exposures is his or her aversion to regret. In their excellent paper on this issue ("Applying Regret Theory to Investment Choices: Currency Hedging Decisions"), Michenaud and Solnick define regret as "a cognitively mediated emotion of pain and anger" that is felt "when agents observe that they took a bad decision in the past and could have take one with a better outcome." They noted that regret theory "assumes that agents are rational, but base their decisions not only on expected payoffs (value) but also on expected regret" to which they have varying levels of aversion. Michenaud and Solnick note that "even with a zero risk premium, regret-averse investors may take a currency risk exposure for fear (potential regret) of missing a large gain on the risky position." Conversely, "even in the presence of a large positive expected risk premium, regret-averse investors will be less inclined to take full exposure to a currency because that would create the potential for regret in the case of large ex-post currency depreciation." Intriguingly, the authors find evidence that regret aversion varies across cultures. For example, among investment managers, it seems to be higher in the United States than in Europe, perhaps because more of the former have their performance measured against peers and benchmarks, while more of the latter are focused on producing a minimum level of return. On a global basis, across 563 institutional investors, the authors found that "39% did not hedge foreign currency exposures; 34% hedged 50% of their exposure; 14% hedged 100% of their exposure, and 13% adopted some other hedging ratio."

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How then, should an investor manage the exposure to foreign exchange risk created by his or her passive allocations to different asset classes? A number of guidelines emerge from the large number of (conflicting, naturally) research papers and articles that have been written on this issue:

Factor	**Implication for FX Hedging**
Percentage of portfolio exposed to foreign currency risk	As the proportion increases, so too may the desire to hedge some of this risk
Confidence in forecasting future exchange rate trends	If 50% hedging is the default for a regret-averse investor, confidence in one's forecasting skill should result in a departure from this benchmark, in a direction based on one's outlook for different exchange rates
Confidence in ability to identify skilled active managers	All else being equal, this may lead to a desire to reduce foreign exchange exposure and reallocate part of the risk budget to active managers
Portfolio weight of foreign bonds relative foreign property and foreign equity	In many, but not all cases, the correlation between exchange rate returns and foreign bond returns is higher than in the case of foreign property or equities. Hence, the potential diversification benefits from an unhedged foreign exchange exposure in a foreign bond heavy portfolio are likely to be lower, assuming (and this is a big if) historical correlations are an accurate predictor of future correlations. This argues for a higher use of hedging, the higher the portfolio's allocation to foreign bonds relative to foreign property and equity
Extent of portfolio diversification	The more broadly a portfolio is diversified across different asset classes, the greater the diversification benefits are likely to be from unhedged foreign exchange exposure
Time frame, performance benchmark and regret aversion	If an investor's performance is evaluated over short time frames relative to a performance benchmark, and his or her aversion to regret is high, the greater the incentive to employ the same hedging

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Factor	Implication for FX Hedging
	approach as other investors. In contrast, longer time horizons, absolute return targets and lower levels of regret aversion seem to lead to less hedging of foreign currency exposures
Cost to use hedging vehicles	All else being equal, the higher the cost (in terms of transaction fees and the opportunity cost of cash calls – e.g., to post more margin on out of the money forward or futures positions), the lower the use of hedging

A further concern for individual investors is their relatively limited access to hedging vehicles and calculation resources, relative to those available to institutional investors. For example, let us suppose that an individual investor, with investments in foreign currency bonds, property and equity, wanted to hedge 50% of his or her foreign currency exposure. The first issue would be calculating the mix of currency exposures inherent in the foreign asset class positions. At best, this can only be roughly estimated, as changes in market capitalization weights in the underlying indexes will cause these exposures to constantly be in flux. Here, let us assume that the investor will employ a constant exposure assumption (e.g., the one we used above). The second issue is how to hedge this. Sophisticated investors could buy currency put options, or directly take short positions in the futures markets (by selling contacts in different foreign currencies). Another alternative would be to buy U.S. Dollar Index Future (USDX) whose value will rise if foreign currencies weaken (USDX exposure weights are Euro, 57.6%; Yen, 13.6%; U.K. Pound, 11.9%; Canadian Dollar, 9.1%; Swedish Krona, 4.2%; and Swiss Franc, 3.6%). If an investor wanted to stay away from directly owning derivatives, he or she could sell short individual currency ETFs, or take a long position in a fund (like RDPIX from Pro Funds or RYSDX from Rydex) that are designed to rise in value as the U.S. dollar strengthens versus other currencies. A final alternative would be to invest in mutual funds in the target asset classes (foreign bonds, property and equity) that explicitly state that they employ currency hedging techniques. The problem here is that these funds rarely commit to a constant hedging policy; rather, they seem to leave it up to the fund manager, so there is clearly an element of active risk involved, which offsets some of the convenience benefits.

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This brings us to our last question: Is foreign exchange a potentially attractive source of uncorrelated alpha returns, to which a portion of an investor's active risk budget should be allocated? As noted above, the presence of many non-profit maximizing players in the foreign exchange market makes them inefficient and creates the opportunity for skilled managers to earn active returns. Broadly speaking, these managers usually employ some combination of four strategies. Since foreign exchange rates tend to trend, momentum can be profitable (for a good paper on this, see "Modeling Optimism and Pessimism in the Foreign Exchange Market" by de Grauwe and Kaltwasser). The second strategy is the "carry trade", where an investor takes a long-position in currencies where interest rates are high, and funds it by borrowing in currencies where interest rates are low. The key assumption underlying this strategy is that the depreciation of high interest rate currencies relative to low interest rate currencies predicted by theory will be delayed by market inefficiencies. The third strategy takes a longer term view, and takes positions based on fundamental factors, like expected changes in relative productivity and inflation rates (for a good paper on this, see "Large Swings in Currencies Driven by Fundamentals" by Cumperayot and de Vries). A final strategy involves trading currency volatility, through buying and selling currency options. There have been a number of studies that suggest currency trading has the potential to, and in fact has in the past, delivered significant returns. There are also some indications that the effectiveness of currency strading strategies varies across currency markets (see, for example, "Performance of Currency Trading Strategies in Developed and Emerging Markets" by Momtchil Pojarliev of Invesco). On the other hand, the point has also been made that, with the growing interest in currency trading and the entrance of more and more hedge funds into this area, intensifying competition could be reducing potential active returns that investors can earn. A final consideration is the limited number of active currency products available to retail investors. Today, there is only one we include in our model portfolios – the Power Shares Deutsche Bank G10 Currency Harvest Fund ETF (DBV), which takes long futures positions in three high interest rate currencies, and short positions in three low interest rate currencies. We include DBV as one of the five products that make up our market neutral index (the others are JAMNX, HSGFX, ANGLX, and OGNAX).

So, what are the key conclusions that emerge from our analysis of issues related to currency exposure?

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- We believe that the separation of currency exposure into a beta/passive hedging and alpha/active returns issues makes sense.
- An allocation to active currency makes sense as a potential source of uncorrelated alpha, though there is a clear risk that potential returns in this area will be lower in the future than they were in the past.
- When the allocation to foreign bonds, property and equity is a sizeable proportion of a portfolio (e.g., 30% or more), investors may logically desire to hedge at least some (e.g., 50%) of the resulting currency exposure, to minimize regret and allow reallocation of the risk budget to other uses.
- That being said, the actual implementation of this desire is quite challenging, because the "right" hedging ratio is essentially unknowable (hence the default to 50%), and the hedging vehicles available to retail investors tend to be difficult and expensive to use, or lack transparency as to the actual hedge ratio employed. As a practical matter, the easiest approaches would seem to be (a) investing in asset class products where the managers employ hedging, even if they don't disclose how the ratio varies over time; or (b) buying a long position in a fund (e.g., equal to half the weight given to foreign currency bonds, property and equity) that is designed to rise in value when your home/functional currency appreciates.

Whole Life Insurance As a Source of Uncorrelated Returns

When it comes to financial mysteries, few seem as impenetrable as life insurance. The basic product is quite simple: you (and a lot of other people) contribute a fixed amount of money each year (called a premium) for a certain period of time (called the term of the insurance policy) into a common pool. Some of these funds are used to pay the life insurance company's operating expenses (including the commissions they pay to the people who sell their product). The remaining funds are invested by the life company's investment managers so that the funds grow over time. If you die during the period the life insurance policy is in force, your beneficiary receives a predetermined amount (the death benefit) to make up for the income

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that is lost through your death. This simple product is known as "term insurance", and it is a pure risk management product.

The confusion about life insurance is caused when life insurance companies bundle investment products with their basic risk management offering. Because these bundled policies have no fixed expiration date, they are known as "permanent" insurance. Conceptually, these policies all work the same way. First, you pay the life insurance company an annual premium. As in the case of term insurance, some of these funds are used to pay the insurance company's operating and distribution expenses. Most funds are invested in a mix of asset classes (e.g., equity, bonds, real estate, etc.). From this investment pool, some payments are made for death benefits. The funds not used for this purpose are distributed back to the policyowners at the end of the year in the form of what life insurance companies call a "dividend" payment. Over time, these dividend payments increase the "cash value" of the policy. This is the amount the policyholder would receive if he or she terminated ("surrendered") the policy before his or her beneficiary received the death benefit (of course, there are other options for using dividend payments, like buying additional insurance coverage or reducing annual premiums. However, in this article, we will assume they are used to increase the policy's cash value).

Permanent insurance goes by many names. In general, four broad categories of products can be distinguished. In the case of traditional "whole life" policies, your premium amount is fixed, and you have no control over how the insurance company invests your premium payments. In "universal life" policies, you have some ability to vary the size of your premium payment, but no control over how your funds are invested. In the case of "variable life", your premium is fixed, but you control how premium payments are invested – you can usually divide them between different separate accounts offered by the life company (e.g., a bond account, a U.S. equity account, etc.). Finally, a "universal variable" policy allows you to both vary the size of your premium payment and control how those funds are invested.

All this complexity raises an obvious question: why would someone choose a bundled risk management and investment product over the apparently simpler alternative of purchasing term insurance and investing in mutual and exchange traded funds? The first reason is that, thanks to very effective lobbying by the insurance industry many years ago, the build-up of life insurance policy cash values is exempt from annual income tax. However, if

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the policy is surrendered before death, ordinary income tax is owed on the difference between the cash value received and the sum of premium payments made over the policy's life (unless the cash value is rolled into another life policy or annuity, in which case no tax is owed). In this case, if a person had already made their maximum contribution to other tax advantaged savings vehicles (like a 401k and IRA), then a permanent life policy might make sense.

The second reason is that a person might prefer level premiums over time. While some term policies offer level premiums for a period of time, after this point, annual premiums increase quite sharply with age. Only permanent insurance offers a constant premium payment over the life of the policy.

The third reason a person might choose a bundled policy is the subject of this article. We have repeatedly noted that broadly understood, asset allocation policy encompasses more than financial investments, and should also take housing, labor force status and insurance products into account, as they all affect the extent to which an investor's long term liabilities (e.g., the amount he or she wants to accumulate to provide retirement income) will be funded after a given period of time. It is in this context that we will take a closer look at permanent life insurance.

We will address this issue by looking at a single type of policy from a single company. To keep it simple, we have chosen a whole life policy. To put the insurance industry in the best light, we will look at the gross dividend yield on a whole life policy from Northwestern Mutual Life (NWML), which for years has been widely regarded as the best company in the industry.

As an aside, we should note that, beyond good underwriting (i.e., mortality risk management), investment management, and cost control skills, Northwestern Mutual's top performance rating also derives from its mutual ownership structure. In mutual companies, policyholders own the company, and receive the entire benefit of investment returns that are in excess of operating and mortality charges. In an investor-owned insurance company, these benefits must be divided between shareholders and policyowners. We should also note that in the mutual fund world, only Vanguard is owned by its fundowners, which is another reason it is able to keep the expenses charged on its index funds at such low levels.

But we digress. Back to our NWML example. Between 1994 and 2004, the real annual dividend rate on an NWML whole life policy averaged 8.89% with a standard deviation of

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just .66%. Equally impressive was the low correlation of annual dividend yields with the returns on broadly defined asset classes over the same period:

Asset Class	**Correlation with NWML Whole Life Dividend Yields**
Real Return Bonds	(.30)
Domestic Bonds	.32
Foreign Bonds	.06
Domestic Property	.04
Foreign Property	(.05)
Commodities	(.67)
Timber	.04
Domestic Equity	.24
Foreign Equity	.15
Emerging Equity	.07

As you can see, the combined effect of operating cost, mortality and investment risk management has, in the past, produced a stream of policy dividend yields with attractively low correlations with the returns on major asset classes found in many investors' portfolios. While some may still argue that it might be cheaper to buy cheaper (at least in the early years) term instead of permanent insurance and invest the difference in other investment products whose returns have low correlations with major asset classes, few if any of these alternatives would provide an investor with exposure to mortality risk and the return for bearing it (not to mention the advantages of NWML's apparently superior ability to manage it). We therefore conclude that, in the context of a broad view of asset allocation policy, there is an argument to be made in favor of whole life insurance, at least from NWML.

Product and Strategy Notes

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Interesting Research Papers

Over the last month, we've read a number of papers we believe might be of interest to some or all of our subscribers. In "Long-Term Reversals: Overreaction or Taxes", George and Hwang pose a serious challenge to the behavioral finance community. Historically, behavioral finance has attributed the existence of short term stock momentum and its eventual reversal to some combination of investors' cognitive limitations and durable barriers to complete arbitrage (which enable less than fully rational investors to have an impact on market prices). The cognitive limitations in question are usually deemed to be underreaction to new information that disconfirms existing views, overreaction to new information which confirms them, and eventual (and sudden) reversals when sufficient disconfirming evidence accumulates to cause investors to change their views and others to herd behind them. In their new paper, George and Hwang show that a better explanation for momentum is the reluctance of investors to sell their winners and thereby trigger the payment of capital gains taxes.

On a more technical level, Professor Andrew Lo from MIT has proposed a new approach to the vexing (but critical) question of how to measure the amount of alpha (active return) that active investment managers actually generate. In "Where Do Alphas Come From?", he proposes the simple but straightforward approach of using the covariance between portfolio weights and returns to measure the results of active management.

One of the most insightful financial writers we know is Michael Mauboussin, who is currently based at Legg Mason. His two most recent publications (available at http://www.leggmason.com/funds/knowledge/mauboussin/mauboussin.asp) on "Turtles in Omaha" and "Explaining the Wisdom of Crowds" are not to be missed.

Finally, the Federal Reserve Bank of Cleveland recently published a fascinating article by Bryan and Molloy titled "Mirror, Mirror, Who's the Best Forecaster of Them All?" After examining 23 years of forecasts by leading economists, they "find little evidence that any forecaster consistently predicts better than the consensus (median) forecast and, further, that forecasters who gave better-than-average predictions in one year were unable to sustain their superior forecasting performance beyond the degree that random chance would suggest." However, the median forecast was within ½ percent of the actual year-ahead outcome (for GDP growth and inflation) only 30% of the time. Almost half the time, the median forecast was off by 1% or more. This paper's findings mirror those in the 2001 paper by Chan,

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Karceski and Lakonishok, on "The Level and Persistence of Growth Rates." The concluded that "there is scant persistence in earnings growth beyond chance, and limited ability to identify firms with high future long-term growth…Valuations that assume persistently high growth over prolonged periods rest on shaky foundations." Sobering reading for people who believe in allocating substantial portions of their portfolios to actively managed products.

Interesting New Products

Two recent product launches in the United States also caught out attention. Vanguard has introduced a new ETF that tracks the FTSE All-World ex US Index (ticker VEU, expenses .25%). The FTSE index differs somewhat from the indexes tracked by Vanguard's Total International Stock Market mutual fund (VGTSX; .32% expenses). The latter is a combination of the MSCI EAFE and Emerging Markets Index, which excludes Canada. The former includes Canada at a 5% weight. In both indexes, emerging markets' weight is 15% to 16%. We have a mixed view of these very broadly based international index products. On the positive side, for investors with limited funds, they can be a very useful source of portfolio diversification. However, their relatively small allocations to emerging markets (e.g., a 30% allocation to one of these funds would result in a 5% effective allocation to emerging markets) may be suboptimal for many investors. For investors who have enough money to invest in a larger number of funds, larger allocations to emerging markets to produce higher returns may make sense, since other asset class products can be used to diversify and reduce some portion of the added risk.

The second product that caught our eye was the new Managed Futures Fund from Rydex (RYMFX; expenses 1.65%). This fund tracks the new "Diversified Trends Indicator Index" (DTI) launched by Standard and Poor's. This index is based on a large number of futures contracts, with a 50% weighting on commodities, 35% on major currencies, and 15% on U.S. interest rates. Most interestingly, the index attempts to simulate the trend following strategy used by many active futures investors. It does this by taking either long or short positions in the futures it tracks based on their recent performance compared to their long-term moving average. Standard and Poor's backtesting analysis shows that the correlation of the returns on the DTI with those on most major asset classes is quite low, with the highest

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being found versus "long-only" commodity products (especially the Goldman Sachs Commodities Index; correlation with the Dow Jones AIG Commodities Index is lower). This fund is an obvious candidate for inclusion in the portion of an investor's portfolio allocated to actively managed market neutral products that are expected to have low correlations of returns with those on passive asset class index funds. However, investors making this move should do so with their eyes wide open – trend following strategies only work when there are trends to follow. In periods (like today) when there are few discernible trends (i.e., when volatility in most asset classes and currencies is low, and the market is said to be "moving sideways"), these funds tend to lose money. In addition, with more and more hedge fund managers seeking to justify their "2 and 20" compensation arrangements (or, perhaps more accurately, continue to pay for what have become for some of them quite expensive lifestyles), the competition in the trend following space has increased, which should put downward pressure on returns even when market conditions are favorable.

2006-2007 Model Portfolios Update

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

We use two benchmarks to measure the performance of our model portfolios. The first is cash, which we define as the yield on a one year government security purchased on the last trading day of the previous year. For 2007, our Pounds Sterling cash benchmark is 5.30%

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(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.indexinvestor.com/Members/YTDReturns/UK.php

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