Retired Investor

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Contents

This Month's Issue: Key Points

This month's first feature article asks whether commodity index funds are now overvalued. We review the return generating process for commodity index funds. We also review how commodity prices change over the course of the business cycle, and become more volatile at the peak. We then show how the increased participation of momentum-oriented active investors in commodity markets further raised the probability of overvaluation occurring. We conclude that we are now at or very close to the top of the price cycle for many commodities. While we continue to believe that our assumed return of real bonds plus four percent is a reasonable long-estimate for commodity index futures as an asset class, there is a high probability that short term returns will be much lower.

Our second feature article asks whether commercial property index funds are now overvalued. We review the commercial property cycle, and use our returns supply/demand model to asses the reasonableness of current valuations. We conclude that it is most likely that we are approaching, or at, the top of a commercial property cycle in many currency zones.

As always, we note the difficulty of trying to time markets. If an investor has already made his or her allocation to commodities and/or commercial property, and if those allocations are currently above their target portfolio weights, this would be a good time to

ISSN 1554-5067

rebalance, perhaps to a level somewhat below the target weights. On the other hand, if an investor has not yet made his or her allocation to commodities or commercial property, we believe that the prudent course of action would be to defer any reallocation until commodity and commercial property prices have come down from their current levels. To help our readers make this judgment, we will be adding these two asset classes to our regular monthly asset class valuation update feature.

This Month's Letters to the Editor

What caused the changes in the model portfolio asset class weights between 2004-2005 and 2006-2007?

Three factors combined in our biennial asset allocation review to change the target weights in many of our model portfolios. The first was he impact of adding foreign commercial property and timber as potential investment options. The second was changes in the maximum amount that can be invested in some asset classes. In particular, in response to subscriber requests, we reduced the maximum allocation to foreign currency bonds to 20%. The third was the impact of changing risk and return expectations for different asset classes. Between 2003 and 2005, real interest rates fell in most countries; since this is the basic building block in our forward looking return estimation model, this resulted in lower expected returns for all classes. Forward looking estimates account for 50% of the weight in our portfolios; the other 50% is based on estimated derived from historical data.

Do you think that real return bonds, as an asset class, are overvalued today? – a U.K. subscriber

With the exception of Australia, yields on inflation indexed (real return) government bonds are well below their average historical levels of around three percent. As always, there are two ways to look at this: one can assume that markets are generally efficient and in equilibrium (in which case, current rates are rational, and don't represent overvaluation), or one can assume that markets sometimes depart from efficiency and equilibrium. Our commentary last month on the speech by Dr. Mervyn King, Governor of the Bank of England,

ISSN 1554-5067

generally took the efficiency path. Since the yield on real return bonds theoretically is the price that balances the desire to save and the desire to invest, the decline in real rates rationally must reflect an increase in desired saving relative to desired investment. We discussed how some combination of increasing risk aversion and a growing willingness to defer consumption would lead to higher savings. For example, in "Rare Events and the Equity Premium", Robert Barro from Harvard theorizes that investors take into consideration events that have very low probabilities but very serious negative consequences. As the probability for an extreme event increases, the value of risk free assets (like real return government bonds) increases. People will pay more to own them, raising their price and depressing their yield.

We also discussed how a combination of an expected fall in productivity and/or an expected fall in the share of output going to capital providers (e.g., due to an increase in the share going to labor, taxes, or consumers via lower prices) would lead to lower investment. In sum, the efficient markets/equilibrium approach leads you to conclude that while real return bonds yields are at historical lows, this does not result from their being overvalued.

On the other hand, Dr. King also raised the possibility that inefficiency may be playing a role, with excess liquidity generation by central banks leading to the overvaluation of many asset classes, including real return bonds. Further evidence for this is found in the observation by many commentators that changes in corporate pension funding rules have led many plan sponsors to shift from equities to real return bonds. At a time when the supply of these bonds is still relatively small, this could have artificially raised their price and depressed their yields.

On balance, we conclude that most of the decline in real yields probably represents equilibrium factors, and that inefficiency likely plays a lesser role. To be sure, one could say, legitimately, that some of these “rational factors” (say, savers rising risk aversion) are based, at least in part, on emotional considerations. Thus, even from the equilibrium perspective there are some grounds for asserting that the current decline in real yields is excessive. That being said, one is left with the question of what to do. In our view, the next best alternative to real return bonds are short-term nominal return government securities, whose yield is resent with sufficient frequency to quickly incorporate any changes in inflation.

ISSN 1554-5067

Global Asset Class Returns

YTD 28Feb06	In USD	In AUD	In CAD	In EUR	In JPY	In GBP	In CHF	In INR
Asset Held								
US Bonds	0.30%	-0.97%	-2.04%	-0.39%	-1.59%	-1.65%	0.27%	-1.46%
US Prop.	9.50%	8.23%	7.16%	8.81%	7.61%	7.55%	9.47%	7.74%
US Equity	3.50%	2.23%	1.16%	2.81%	1.61%	1.55%	3.47%	1.74%
AUS Bonds	0.79%	-0.47%	-1.54%	0.10%	-1.09%	-1.15%	0.77%	-0.96%
AUS Prop.	-1.79%	-3.06%	-4.13%	-2.48%	-3.68%	-3.74%	-1.81%	-3.55%
AUS Equity	5.58%	4.31%	3.24%	4.89%	3.70%	3.64%	5.56%	3.83%
CAN Bonds	2.39%	1.12%	0.05%	1.70%	0.50%	0.44%	2.36%	0.63%
CAN Prop.	8.53%	7.26%	6.19%	7.84%	6.64%	6.58%	8.51%	6.78%
CAN Equity	6.58%	5.31%	4.24%	5.88%	4.69%	4.63%	6.55%	4.82%
Euro Bonds	0.70%	-0.57%	-1.64%	0.01%	-1.19%	-1.25%	0.67%	-1.06%
Euro Prop.	15.86%	14.59%	13.52%	15.17%	13.97%	13.91%	15.83%	14.10%
Euro Equity	7.51%	6.24%	5.17%	6.82%	5.62%	5.56%	7.48%	5.75%
Japan Bonds	1.28%	0.01%	-1.06%	0.59%	-0.61%	-0.67%	1.25%	-0.48%
Japan Prop.	2.74%	1.47%	0.40%	2.05%	0.85%	0.79%	2.71%	0.98%
Japan Equity	2.07%	0.80%	-0.27%	1.38%	0.18%	0.12%	2.04%	0.31%
UK Bonds	3.06%	1.79%	0.72%	2.37%	1.17%	1.11%	3.03%	1.30%
UK Prop.	13.44%	12.17%	11.10%	12.75%	11.55%	11.49%	13.41%	11.68%
UK Equity	5.49%	4.22%	3.15%	4.80%	3.60%	3.54%	5.46%	3.73%
World Bonds	0.75%	-0.52%	-1.59%	0.06%	-1.14%	-1.20%	0.72%	-1.01%
World Prop.	8.53%	7.26%	6.19%	7.84%	6.64%	6.58%	8.50%	6.77%
World Equity	4.80%	3.53%	2.46%	4.11%	2.91%	2.85%	4.77%	3.04%
Commodities	-5.10%	-6.37%	-7.44%	-5.79%	-6.99%	-7.05%	-5.13%	-6.86%
Timber	5.36%	4.09%	3.02%	4.67%	3.47%	3.41%	5.33%	3.60%
EqMktNeutral	1.66%	0.39%	-0.68%	0.97%	-0.23%	-0.29%	1.63%	-0.10%
Volatility	2.24%	0.97%	-0.10%	1.54%	0.35%	0.29%	2.21%	0.48%
Currency								
AUD	1.27%	0.00%	-1.07%	0.58%	-0.62%	-0.68%	1.24%	-0.49%
CAD	2.34%	1.07%	0.00%	1.64%	0.45%	0.39%	2.31%	0.58%
EUR	0.69%	-0.58%	-1.64%	0.00%	-1.19%	-1.25%	0.67%	-1.06%
JPY	1.89%	0.62%	-0.45%	1.19%	0.00%	-0.06%	1.86%	0.13%
GBP	1.95%	0.68%	-0.39%	1.25%	0.06%	0.00%	1.92%	0.19%
USD	0.00%	-1.27%	-2.34%	-0.69%	-1.89%	-1.95%	-0.03%	-1.76%
CHF	0.03%	-1.24%	-2.31%	-0.67%	-1.86%	-1.92%	0.00%	-1.73%
INR	1.76%	0.49%	-0.58%	1.06%	-0.13%	-0.19%	1.73%	0.00%

ISSN 1554-5067

Equity and Bond Market 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, which is equal to either 1% or 2%. Third, we use two different values for the equity risk premium required by investors: 2.5% and 4.0%. Different combinations of these variables yield high and low scenarios for both the future returns the market is expected to supply, and the future returns investors will demand. 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:

Australia	**Low Demanded Return**	**High Demanded Return**
High Supplied Return	65%	100%
Low Supplied Return	101%	140%

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ISSN 1554-5067

Canada	**Low Demanded Return**	**High Demanded Return**
High Supplied Return	90%	159%
Low Supplied Return	179%	269%

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Eurozone	**Low Demanded Return**	**High Demanded Return**
High Supplied Return	66%	116%
Low Supplied Return	121%	182%

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Japan	**Low Demanded Return**	**High Demanded Return**
High Supplied Return	94%	205%
Low Supplied Return	273%	454%

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United Kingdom	**Low Demanded Return**	**High Demanded Return**
High Supplied Return	43%	83%
Low Supplied Return	82%	130%

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United States	**Low Demanded Return**	**High Demanded Return**
High Supplied Return	106%	170%
Low Supplied Return	193%	277%

Switzerland	**Low Demanded Return**	**High Demanded Return**
High Supplied Return	71%	146%
Low Supplied Return	164%	220%

India	**Low Demanded Return**	**High Demanded Return**
High Supplied Return	70%	154%
Low Supplied Return	179%	297%

ISSN 1554-5067

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:

	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	2.34%	2.96%	5.30%	5.26%	-0.04%	0.40%
Canada	1.48%	2.40%	3.88%	4.14%	0.26%	-2.49%
Eurozone	1.46%	2.37%	3.83%	3.49%	-0.34%	3.36%
Japan	0.77%	0.77%	1.54%	1.59%	0.05%	-0.48%
UK	1.08%	3.17%	4.25%	4.19%	-0.06%	0.60%
USA	1.94%	2.93%	4.87%	4.55%	-0.32%	3.13%
Switz.	0.93%*	2.03%	2.96%	2.23%	-0.73%	7.37%
India	1.76%*	7.57%	9.33%	7.26%	-2.07%	21.06%

*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%. Were we to use this rate, bond markets would generally look even more overvalued. It also uses historical inflation as an estimate of expected future inflation. This

ISSN 1554-5067

may not produce an accurate valuation estimate, if the historical average level of inflation is not a good predictor of average future inflation levels.

Second, this analysis looks only at ten-year government bonds. The relative valuation of non-government bond markets is also affected by the extent to which their respective credit spreads (that is, the difference in yield between an investment grade or high yield corporate bond and a government bond of comparable maturity) are above or below their historical averages (with below average credit spreads indicating potential overvaluation). Today, in many markets credit spreads are at the low end of their historical ranges, which would make non-government bonds appear even more overvalued.

Third, 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.

Finally, 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

	To AUD	**To CAD**	**To EUR**	**To JPY**	**To GBP**	**To USD**	**To CHF**	**To INR**
From								
AUD	0.00%	-1.12%	-1.77%	-3.67%	-1.07%	-0.71%	-3.03%	2.00%
CAD	1.12%	0.00%	-0.65%	-2.55%	0.05%	0.41%	-1.91%	3.12%
EUR	1.77%	0.65%	0.00%	-1.90%	0.70%	1.06%	-1.26%	3.77%
JPY	3.67%	2.55%	1.90%	0.00%	2.60%	2.96%	0.64%	5.67%
GBP	1.07%	-0.05%	-0.70%	-2.60%	0.00%	0.36%	-1.96%	3.07%
USD	0.71%	-0.41%	-1.06%	-2.96%	-0.36%	0.00%	-2.32%	2.71%
CHF	3.03%	1.91%	1.26%	-0.64%	1.96%	2.32%	0.00%	5.03%
INR	-2.00%	-3.12%	-3.77%	-5.67%	-3.07%	-2.71%	-5.03%	0.00%

ISSN 1554-5067

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 highest year-to-date returns in the table give a rough indication of how investors employing different strategies 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

ISSN 1554-5067

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.

Year-to-Date Returns on Classic Rotation Strategies in the U.S. Markets

YTD 28Feb06				
Economy	Bottoming	Strengthening	Peaking	Weakening
Interest Rates	Falling	Bottom	Rising	Peak
Style Rotation	Growth (IWZ) **2.48%**	Value (IWW) **4.53%**	Value (IWW) **4.53%**	Growth (IWZ) **2.48%**
Size Rotation	Small (IWM) **8.57%**	Small (IWM) **8.57%**	Large (IWB) **3.16%**	Large (IWB) **3.16%**
Style and Size Rotation	Small Growth (DSG) **7.74%**	Small Value (DSV) **7.34%**	Large Value (ELV) **3.49%**	Large Growth (ELG) **1.86%**
Sector Rotation	Cyclicals (IYC) **2.33%** Technology (IYW) **2.86%**	Basic Materials (IYM) **3.71%** Industrials (IYJ) **4.22%**	Energy (IYE) **3.66%** Staples (IYK) **1.15%**	Utilities (IDU) **3.48%** Financials (IYF) **3.47%**
Bond Market Rotation	High Risk (VWEHX) **1.60%**	Short Maturity (VBISX) **0.10%**	Low Risk (VIPSX) **0.00%**	Long Maturity (VBLTX) **0.10%**

ISSN 1554-5067

Are Commodities Index Funds Overvalued?

At the end of 2003, there was approximately $500 million invested in commodity index products of all types (e.g., mutual funds, structured notes, etc.) The most recent estimate we saw now places this figure at $13 billion. We have also seen, at least over the past few years, commodity index funds deliver attractive returns. This raises an inevitable question: are commodity index funds overvalued today?

We'll begin our analysis with a brief overview of the return generating process for a commodity index fund. We know this gets a bit technical; however, please bear with us as it is necessary to understand our valuation analysis. This return generating process has five main elements. The first is changes in foreign exchange rates. Since most commodities are priced in U.S. dollars, investors with other functional currencies will derive a portion of their returns from exchange rate changes.

The second source of return is known as the "collateral yield." To see how this works, let's assume an investor buys a share of a commodity index fund for $100. The commodity index fund then uses part of this $100 to purchase futures contracts (we'll leave swaps and other approaches the fund might use to invest in commodities out of this discussion). A future contract obligates the owner to purchase a fixed amount of a commodity at a specific date in the future at a specific price. These contracts do not require that the buyer immediately pay the full value of the contract. Rather, the buyer initially provides only a fraction of the value of the contract, which is known as the "margin" amount. The remainder of the $100 received from the investor is invested in another investment, typically government bonds. The return on these bonds is known as the "collateral return."

The third source of return for a commodity index fund is the diversification benefit from investing in a number of commodities whose returns (a) have high volatilities, and (b) low correlations with each other. In their paper "The Tactical and Strategic Value of Commodity Futures", Erb and Harvey estimate the size of this "diversification return" at 3.0 to 4.5% per year for a fund holding a range of different commodity futures contracts.

The fourth source of return for a commodity index fund is unexpected changes in the cash market (also known as the "spot market") value of the commodities on which it owns futures contracts. For example, let's say a commodity fund purchased a futures contract today

  ISSN 1554-5067

that obliged it to buy 1,000 barrels of oil in three months at $60 per barrel. Implicit in that $60 futures price is investors' collective forecast of the future spot price of oil (however, because of the factors described below, it is not accurate to say that $60 itself is the forecasted future price). Since the commodity fund is not in the business of taking delivery of physical oil (and incurring storage charges), it will sell this futures contract close to its maturity date (technically, settlement date), and use the proceeds (technically, "roll over" the proceeds) to purchase another three-month oil futures contract. As the settlement date nears, the market value of the futures contract will converge with the spot price of oil (i.e., the price at which you can purchase physical oil for immediate delivery). Assume that the spot price actually rises to $70 per barrel. The "spot return" on this futures contract will be $10 per barrel, which represents the unexpected change in the spot market price.

The fifth source of return for a commodity index fund is known as the "roll return." It reflects the observation that, even absent any expected change in the spot price over time, the futures contract price for a commodity will still not equal the spot price. A situation in which the futures price is lower than the spot price is known as "backwardation." A situation in which the futures price is higher than the spot price is known as "contango." As previously noted, commodity index funds are buyers, not sellers of commodity futures contracts. As such, they prefer backwardation, which allows them to buy low, and sell high, so to speak, and earn a positive "roll return." In contrast, if they are facing a contango, their roll return will be negative – the commodity index fund will be forced to buy high and sell low.

Apart from being rather intimidating words, the subject of whether one should normally expect commodity prices to be backwardated or contangoed is one of the most contentious subjects in finance. Broadly speaking, there are two schools of thought.

The first is known as the "hedging pressure" or "insurance" theory of commodity futures prices. The classic article on this theory is "Hedging Pressure Effects in Futures Markets" by de Roon, Nijman and Veld. In essence, it assumes the existence of one party that wants to limit its exposure to changes in commodity prices, and another who will provide this insurance for a premium, which takes the form of a difference between the spot price and the futures price. One example of this would be a commodity producer that wanted to lock in a future commodity price (e.g., because it must pay a fixed interest rate on its debt). It sells a futures contract that commits it to sell a specified amount of the commodity at a specified

ISSN 1554-5067

price at a specified date in the future. The buyer of that futures contract cannot be certain of the future spot price (though he or she will undoubtedly have made a forecast of what it will be). In exchange for taking on this risk, the buyer requires a futures price that is below what he or she expects the spot price to be.

Now consider another alternative. In this case, it is a producer of a product that uses large amounts of a commodity as an input. If the producer cannot pass on (in the form of higher prices) changes in the cost of the commodity, it will want to lock-in the price of that commodity. It can do this by buying a futures contract that obliges it to purchase a specified amount of the commodity at a specified price at specified date in the future. In this case, the party providing the insurance will be the seller of the futures contract. The insurance premium charged will take the form of a futures price that is higher than the expected spot price.

These two examples make another point clear: the hedging pressure (or insurance) theory of commodity futures prices is agnostic about whether backwardation or contango is the normal state of affairs. As you can see, both make logical sense, depending on the circumstances. On balance, backwardation is probably more likely only because in the case of most commodities there are more producers who are worried about price risk than consumers who are worried about cost risk.

So how well does the evidence align with the hedging pressure theory? The best answer is, "reasonably well, but with some important exceptions." On the positive side, some commodities seem to be backwardated and contangoed fairly consistently. On the negative side, there are other commodities that seem to vary between the two. This has led to the search for second theory to explain commodity futures pricing.

This second theory is variously known as the theory of storage or of "convenience yield." Its starting assumption is that the alternative to buying a futures contract is to buy the commodity immediately at the spot price, and then pay storage and financing charges until it is used. The futures contract price should therefore be equal to the spot price plus storage and financing costs – in other words, contango should be the normal state of affairs. But as we know, sometimes it is not. The reason for this is buyers' worries about the physical availability of the commodity in question. If inventories are low relative to demand for the commodity, buyers become concerned about supply disruptions and delivery risk. To avoid

ISSN 1554-5067

this risk, they want to own the physical commodity rather than the futures contract. This causes them to bid up the spot price to a level above the futures price (producing backwardation). This increase in the spot price is known as the "convenience yield." (For more on this theory, we recommend the following: "The Convenience Yield and Risk Premia of Storage" by Dincerler, Khokher, and Simin; "Equilibrium Commodity Prices with Irreversible Investment and Non-Linear Technologies" by Casassus, Collin-Dufresne, and Routledge; and "Pricing LME Commodity Futures Contracts" by Richard Heaney).

As you can see, the two theories – hedging pressure and convenience yield – are not mutually exclusive. The first focuses on price risk, while the second focuses on liquidity (delivery) risk. In fact, in their paper "Hedging Pressure, Delivery Risk and Risk Premium in Futures Market: Empirical Evidence", Kang and Roongsangmanoon conclude that both theories are at work in commodity markets, and that their interaction produces non-linear price effects. Bowman and Husain from the International Monetary Fund reach a similar conclusion in their paper "Forecasting Commodity Prices: Futures Versus Judgement."

Now that we have defined them, let's next look at the reliability of our five sources of return on a commodities index fund.

As we have noted in many previous articles, while differences between bond yields and two countries are a good theoretical indicator of likely exchange rate changes, history has shown that the actual process is quite close to being random.

In contrast, collateral return is undoubtedly the most reliable source of return, and is primarily influenced by the level of prevailing interest rates. To a lesser extent, it is also affected by the specific bonds investments used by the commodity fund manager (e.g., nominal versus real return bonds), and any active management skill the manager brings to the collateral bond portfolio.

As Erb and Harvey have noted, the diversification return is also reasonably reliable. On the other hand, they also show how unexpected spot returns and roll returns often net out to zero for many commodities over long periods of time. This is consistent with the findings of an IMF paper by Cashin and McDermott. In "The Long-Run Behavior of Commodity Prices," they find that a slow long-term decline in real commodity prices is, for all practical purposes, overwhelmed by their year-to-year variability (i.e., by cyclical factors).

ISSN 1554-5067

Taking all these factors into consideration, in our forward looking asset pricing models, the long term return on a commodities index fund is principally determined by the diversification return, which we assume to be four percent. This is added to the real bond yield (a proxy for the collateral return) to generate the total estimated return.

Let's now move on to the question of whether commodities index funds are overvalued today. An important starting point is a theory of how commodity prices should evolve over the business cycle. The following table summarizes a common view, based on the convenience yield (inventory) approach. In essence, as the economy emerges from recession, commodity inventories are drawn down, which triggers an increase in the spot price. This induces commodity producers to bring older capacity (with higher operating costs) back online, and, eventually, to increase in new capacity. However, the latter usually happens late in the cycle, so that much of the new capacity comes online after the economy has peaked. This causes commodity inventories to peak as economic demand hits bottom.

Economic and Commodity Demand	***Bottoming***	***Strengthening***	***Peaking***	***Weakening***
Commodity Supply	***Falling (old capacity taken offline)***	***Bottoming (highest cost capacity retired)***	***Rising (old capacity reactivated)***	***Peaks (new capacity comes on)***
Commodity Inventories Relative to Demand	***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	***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)***

One critical aspect of this cycle, which is very relevant to the valuation issue, is that, as economic demand peaks, the old commodity production capacity that comes back online often has significantly higher operating costs. In effect, the supply curve becomes much steeper. Along with declining inventories, this helps drive up spot prices – often by a significant amount. However, this has two important consequences, which together increase price

ISSN 1554-5067

volatility and the likelihood of positive and negative spot returns for investors in commodity futures. First, when the supply curve becomes steep, even a small fall in demand can cause a sharp drop in spot prices. And it is always the case that, beyond a certain point (say, $3 per gallon gasoline in the United States), continued increases in the price of a commodity cause a fall in demand. This is one of the factors that make commodity market tops so fragile.

On the other hand, the older commodity production capacity put back in service is often unreliable. Hence, periods of high economic demand are also those most subject to what are known as “unplanned outages” or “supply disruptions" that serve to increase customer nervousness and cause even sharper rises in spot prices. Recent years have seen a sharp increase in demand for many commodities, driven by strong overall economic demand growth, particularly in China. It is therefore reasonable to believe we are in the most dangerous phase of this physical commodities cycle.

To this normal cyclical process, (which varies in intensity, depending on the commodity in question), we have to add two new financial factors. The first is the sharp increase in commodity index funds that are buyers of commodity futures contracts (i.e., providers of commodity price insurance). While the increase in commodity production due to rising economic demand has no doubt increased the demand for commodity price insurance, it seems likely that this has been outmatched by an even bigger increase in supply of insurance available from commodity index funds. On balance, it seems likely that, from the hedging pressure perspective, the size of potential roll returns has declined (we should also note that this is further compounded by the inability of commodity index funds to be sellers of futures contracts to earn roll returns in contango situations).

The second new financial factor is the entry of hedge funds and other active investors into commodity futures markets (as both buyers and sellers) in search of short-term gains driven by spot returns and high volatility. Given their documented tendency to follow momentum trading strategies, it is not unreasonable to conclude that the increase in financial speculation in commodities will cause prices to overshoot levels justified by the normal physical cycle.

Indeed, at a time when the case for continued global demand growth seems weaker and weaker (e.g., with both the U.S. Federal Reserve and European Central Banks raising interest rates), the increases (through the end of February) in the Economist Commodity Price

  ISSN 1554-5067

Indices over the last year have remained very strong: 13.6% (in U.S. Dollar terms) for the overall index, and 25.7% in Euro, 26.0% in Yen and 24.6% in U.K. Pounds. In subgroups, the increase has been even more impressive: industrial metals, 28.5% (in U.S. Dollars), oil, 19.4%, and non-food agricultural products, 14.4%.

All of these considerations lead us to conclude that we are now at or very close to the top of the price cycle for many commodities. While we continue to believe that our assumed return of real bonds plus four percent is a reasonable long-estimate for commodity index futures as an asset class, there is a high probability that short term returns will be much lower. As always, we note the difficulty of trying to time markets. If an investor has already made his or her allocation to commodities, and if that allocation is currently above its target portfolio weight, this would be a good time to rebalance, perhaps to a level somewhat below the target weight. On the other hand, if an investor has not yet made his or her allocation to commodities, we believe that the prudent course of action would be to defer any reallocation until commodity prices have come down from their current levels. To help our readers make this judgment, we will be adding a commodities section to our regular monthly asset class valuation update feature.

Are Commercial Property Funds Overvalued?

Like commodities, commercial property is another asset class that has seen a sharp increase in prices over the past few years. One part of its attraction is clear. More and more countries have legalized the use of vehicles known (in the U.S. and Canada) as real estate investment trusts (REITs). These vehicles own commercial property, trade publicly, and are usually exempt from corporate taxes provided they pay out a high percentage of their earnings (e.g., 90%) as dividends to their shareholders. In an era where current income returns on many other asset classes are quite low, the relatively high dividend yields offered by REITs have attracted the interest of many investors.

Once again, however, the question must be asked: have the high returns on commercial property securities in recent years represented too much of a good thing? Are they now overvalued?

ISSN 1554-5067

We will begin our analysis with a brief overview of the classic commercial property cycle, which is summarized in the following table.

Economic Demand	***Bottoming***	***Strengthening***	***Peaking***	***Weakening***
Interest Rates	***Falling***	***Bottoming***	***Rising***	***Peaking***
Demand for Space	***Bottoming***	***Strengthening***	***Peaking***	***Weakening***
Vacancy Rate	***Peaking***	***Falling***	***Bottoming***	***Rising***
Rents	***Low***	***Rising***	***High***	***Falling***
New Construction Completion (space coming onto the market)	***Falling***	***Bottoming***	***Rising***	***Peaking***
Property Values	***Bottoming***	***Rising***	***Peaking***	***Falling***

Let us start from the third column, when an economy begins to come out of recession. Vacancy rates begin to fall, and rents begin to rise, while interest rates are low. Since the market value of a commercial property is equal to the capitalized value of its expected rental income stream, the rise in rents leads to in an increase in property values. As the economy nears the peak of demand growth, rising property values (driven by further increases in rental income) have triggered an increase in new construction activity. Some of this comes onto the market after the economy has passed its peak, which accelerates the fall in rents and (along with rising interest rates), causes a decline in property values which continues through the bottom of the economic demand cycle.

To be sure, it can be argued that different types of commercial property pass through this cycle at different speeds. For example, the valuation of retail properties (where rents are driven by consumer spending) seems to track the economic cycle more closely than the valuation of office properties (that tends to track employment growth, which lags demand growth). That being said, one way to answer the valuation question is to ask which stage of the economic cycle we are in today. The recent experience of strong demand growth and rising interest rates suggest column four, which implies that commercial property values are peaking.

Another way to approach this question is via our Retired Investor equity valuation model (since REITs are traded on the public equity market). As you recall, this valuation

  ISSN 1554-5067

model has two parts: the returns companies are expected to supply, and the returns investors logically demand. In a market in equilibrium, these two will be the equal; however, as we have noted, since the financial markets are a complex adaptive system, they are usually not in equilibrium (though they are strongly drawn towards it).

Let's start with the returns that companies are expected to supply. They are estimated as the sum of the current dividend yield on a stock (or market) and the rate at which these dividends are expected to grow in the future. Unfortunately, while the current dividend yield on commercial property securities is easy to obtain, the rate at which dividends are expected to grow in the future can only be assumed. This task is made much harder by the relative scarcity of historical data for commercial property securities, which are relatively new in many countries.

The returns that investors demand are also composed of two parts. The first is the current yield on real return government bonds, which is the basic building block for all financial asset returns. The second is a premium that reflects the relative riskiness of the asset class in question. In this case, like many others we have judged the riskiness of liquid commercial property securities to lie in between investment grade bonds and equities; the specific risk premium we use in our asset pricing model is 2.5%.

Since the future rate of dividend growth is so hard to estimate, one way to approach the valuation question is to assume the market is in equilibrium, and that the returns the market is expected to supply equal those rationally demanded by investors. This allows you to derive the rate of growth by subtracting the current dividend yield from the sum of the current real bond yield plus the assumed commercial property risk premium. This calculation is shown in the following table for five markets with significant trading volume in commercial property securities.

  ISSN 1554-5067

Country	Real Bond Yield	Plus Commercial Property Risk Premium	Less Dividend Yield on Commercial Property Securities	Equals Expected Rate of Future Dividend Growth
Australia	***2.19%***	***2.50%***	***6.61%***	***-1.92%***
Canada	***1.52%***	***2.50%***	***6.30%***	***-2.28%***
Netherlands	***1.43%***	***2.50%***	***5.26%***	***-1.33%***
Japan	***0.71%***	***2.50%***	***3.45%***	***-0.24%***
United States	***1.97%***	***2.50%***	***4.36%***	***0.11%***

- Data are from January, 2006

As you can see, this approach yields negative expected dividend growth rates. On the one hand, this is consistent with the view that we are approaching the top of a commercial property cycle. On the other hand, it is probably inconsistent with the expectations of a lot of people who have been investing in commercial property securities on the assumption that they are not currently overvalued.

To put this issue in perspective, the following table shows the implied real growth rates that result from using different assumptions about investors' required risk premium for holding commercial property.

Country	3% Premium	4% Premium	5% Premium	6% Premium
Australia	***-1.42%***	***-0.42%***	***0.58%***	***0.58%***
Canada	***-1.78%***	***-0.78%***	***0.22%***	***0.22%***
Netherlands	***0.26%***	***1.26%***	***2.26%***	***2.26%***
Japan	***0.61%***	***1.61%***	***2.61%***	***2.61%***
United States	***-0.83%***	***0.17%***	***1.17%***	***1.17%***

As you can see, it is not until the assumed risk premium reaches 4% to 5% that the implied growth rates all get into a range that many commercial property investors might consider a reasonable assumption. This strikes us as unreasonable for two reasons. The first is that an

ISSN 1554-5067

excellent recent study estimated the risk premium of four percent for directly owned commercial property, which is significantly less liquid, and therefore riskier than commercial property securities (see "The Performance of Real Estate Portfolios: A Simulation Approach" by Fisher and Goetzmann of Yale University).

Second, assuming a 4% to 5% risk premium for liquid commercial property securities also implies that investors simultaneously believe that although we have not reached the peak of the commercial property cycle, equity securities (which should require an even higher risk premium than commercial property securities) are already extremely overvalued.

Based on the rule, "choose the simplest hypothesis", we conclude that it is most likely that we are approaching, or at, the top of a commercial property cycle. This conclusion is corroborated by a new report from HSBC Bank, "A Froth Detecting Mission: Detecting U.S. Housing Bubbles." It finds that "about half of the US housing market is frothy and that this 'bubble zone' may be overvalued by as much as 35-40%, after taking into account low interest rates and tax advantages. Current valuations imply [either] a large permanent reduction in the risk premium and/or a sizable step up in future capital gains, not all of which, we think, is justified. The 'bubble zone' accounts for 50% of US GDP, or over US $ 6 trillion, nearly the size of the German, French, and UK economies put together. In other words, it's big. Therefore, when these housing bubbles begin to deflate, it is likely to have substantial macroeconomic consequences." Moreover, as the Economist global house price index has repeatedly demonstrated, this is not a phenomenon limited to the United States. Arguably, housing bubbles are already deflating in Australia, the United Kingdom, South Africa and Spain. If residential housing markets are at (or beyond) peak valuations, why should we not expect the same to be true of commercial property valuations?

Again, we note the difficulty of trying to time markets. If an investor has already made his or her allocation to commercial property, and if that allocation is currently above its target portfolio weight, this would be a good time to rebalance, perhaps to a level somewhat below the target weight. On the other hand, if an investor has not yet made his or her allocation to commercial property, we believe that the prudent course of action would be to defer any reallocation until the valuation of commercial property securities have declined from their current levels. To help our readers make this judgment, we will be adding a commercial property section to our regular monthly asset class valuation update feature.

ISSN 1554-5067

2006-2007 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 emerging markets equities. There are no limits on the weight that can be given to real return and domestic bonds, and to domestic equities.

ISSN 1554-5067

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 2006, our U.S. cash benchmark is 4.40% (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 are shown in the tables on the following pages. Mutual and exchange traded funds that can be used to implement these model portfolios' asset allocations are listed on our website.

  ISSN 1554-5067

These portfolios seek to maximize the probability of achieving at least the target real return over twenty years, at the lowest possible risk.			
	YTD 28Feb06	**Weight**	**Weighted Return**
	In US$		In US$
7% Target Real Return	*YTD Returns are Nominal*		
Asset Classes			
Real Return Bonds	0.0%	0.0%	**0.0%**
U.S. Bonds	0.3%	0.0%	**0.0%**
Non-U.S. Bonds	1.2%	5.0%	**0.1%**
Domestic Commercial Property	9.5%	0.0%	**0.0%**
Foreign Commercial Property	7.9%	15.0%	**1.2%**
Commodities	-5.1%	10.0%	**-0.5%**
Timber	5.4%	10.0%	**0.5%**
U.S. Equity	3.5%	55.0%	**1.9%**
Foreign Equity (EAFE)	5.6%	5.0%	**0.3%**
Emerging Mkt. Equity	9.9%	0.0%	**0.0%**
		100.0%	**3.5%**

	YTD 28Feb06	**Weight**	**Weighted Return**
	In US$		In US$
6% Target Real Return	*YTD Returns are Nominal*		
Asset Classes			
Real Return Bonds	0.0%	0.0%	**0.0%**
U.S. Bonds	0.3%	0.0%	**0.0%**
Non-U.S. Bonds	1.2%	5.0%	**0.1%**
Domestic Commercial Property	9.5%	0.0%	**0.0%**
Foreign Commercial Property	7.9%	15.0%	**1.2%**
Commodities	-5.1%	10.0%	**-0.5%**
Timber	5.4%	10.0%	**0.5%**
U.S. Equity	3.5%	55.0%	**1.9%**
Foreign Equity (EAFE)	5.6%	0.0%	**0.0%**
Emerging Mkt. Equity	9.9%	5.0%	**0.5%**
		100.0%	**3.7%**

ISSN 1554-5067

	YTD 28Feb06	Weight	Weighted Return
	In US$		In US$
5% Target Real Return	*YTD Returns are Nominal*		
Asset Classes			
Real Return Bonds	0.0%	5.0%	**0.0%**
U.S. Bonds	0.3%	5.0%	**0.0%**
Non-U.S. Bonds	1.2%	15.0%	**0.2%**
Domestic Commercial Property	9.5%	0.0%	**0.0%**
Foreign Commercial Property	7.9%	5.0%	**0.4%**
Commodities	-5.1%	10.0%	**-0.5%**
Timber	5.4%	10.0%	**0.5%**
U.S. Equity	3.5%	35.0%	**1.2%**
Foreign Equity (EAFE)	5.6%	10.0%	**0.6%**
Emerging Mkt. Equity	9.9%	5.0%	**0.5%**
		100.0%	**2.9%**

	YTD 28Feb06	Weight	Weighted Return
	In US$		In US$
4% Target Real Return	*YTD Returns are Nominal*		
Asset Classes			
Real Return Bonds	0.0%	0.0%	**0.0%**
U.S. Bonds	0.3%	15.0%	**0.0%**
Non-U.S. Bonds	1.2%	20.0%	**0.2%**
Domestic Commercial Property	9.5%	0.0%	**0.0%**
Foreign Commercial Property	7.9%	0.0%	**0.0%**
Commodities	-5.1%	10.0%	**-0.5%**
Timber	5.4%	10.0%	**0.5%**
U.S. Equity	3.5%	30.0%	**1.1%**
Foreign Equity (EAFE)	5.6%	10.0%	**0.6%**
Emerging Mkt. Equity	9.9%	5.0%	**0.5%**
		100.0%	**2.4%**

ISSN 1554-5067

	YTD 28Feb06	Weight	Weighted Return
	In US$		In US$
3% Target Real Return	*YTD Returns are Nominal*		
Asset Classes			
Real Return Bonds	0.0%	10.0%	**0.0%**
U.S. Bonds	0.3%	15.0%	**0.0%**
Non-U.S. Bonds	1.2%	15.0%	**0.2%**
Domestic Commercial Property	9.5%	0.0%	**0.0%**
Foreign Commercial Property	7.9%	0.0%	**0.0%**
Commodities	-5.1%	15.0%	**-0.8%**
Timber	5.4%	5.0%	**0.3%**
U.S. Equity	3.5%	25.0%	**0.9%**
Foreign Equity (EAFE)	5.6%	10.0%	**0.6%**
Emerging Mkt. Equity	9.9%	5.0%	**0.5%**
		100.0%	**1.7%**

	YTD 28Feb06	Weight	Weighted Return
	In US$		In US$
2% Target Real Return	*YTD Returns are Nominal*		
Asset Classes			
Real Return Bonds	0.0%	10.0%	**0.0%**
U.S. Bonds	0.3%	15.0%	**0.0%**
Non-U.S. Bonds	1.2%	15.0%	**0.2%**
Domestic Commercial Property	9.5%	0.0%	**0.0%**
Foreign Commercial Property	7.9%	0.0%	**0.0%**
Commodities	-5.1%	15.0%	**-0.8%**
Timber	5.4%	5.0%	**0.3%**
U.S. Equity	3.5%	25.0%	**0.9%**
Foreign Equity (EAFE)	5.6%	10.0%	**0.6%**
Emerging Mkt. Equity	9.9%	5.0%	**0.5%**
		100.0%	**1.7%**

	YTD 28Feb06	Weight	Weighted Return
	In US$		In US$
Equally Weighted	*YTD Returns are Nominal*		
Asset Classes			
Real Return Bonds	0.0%	10.0%	**0.0%**
U.S. Bonds	0.3%	10.0%	**0.0%**
Non-U.S. Bonds	1.2%	10.0%	**0.1%**
Domestic Commercial Property	9.5%	10.0%	**1.0%**
Foreign Commercial Property	7.9%	10.0%	**0.8%**
Commodities	-5.1%	10.0%	**-0.5%**
Timber	5.4%	10.0%	**0.5%**
U.S. Equity	3.5%	10.0%	**0.4%**
Foreign Equity (EAFE)	5.6%	10.0%	**0.6%**
Emerging Mkt. Equity	9.9%	10.0%	**1.0%**
		100.0%	**3.8%**

ISSN 1554-5067