Commodities

THE OPTIMALLY RISKY PORTFOLIO we constructed in the first issue of the Advisor did not include commodities. This non-traditional asset class needed an article devoted to it, and space limitations did not allow us to cover the class in the premiere issue. With the inclusion of this article, we now add commodities to our universe of possible asset classes for portfolio diversification, raising the number from 16 to 17.

When an asset class produces compound returns in excess of 15% per year for four years running, investors are bound to take notice and want a piece of the action. Such is the case with commodities today. This once-neglected asset class has received considerable press because of the high returns it generated from 2002 through 2005. Commodities now generate keen interest among investors. In a world starved for yield, a category that has produced equity-like returns with a negative correlation to the stock market and a positive correlation to inflation appears to be irresistible. With strong returns and excellent portfolio diversification potential, how can we go wrong investing in commodities?

Investing in commodities is also easier now than it once was. Over the past several years, new funds have been started by several firms, and tens of billions of dollars have been invested in the asset category, giving further support to returns. The total investment in such funds was projected to reach $110 billion by the end of 2006, according to an early estimate last year by Barclays Capital.

We can go wrong investing in commodities, however, if we aren't smart about how we do so or if we have unreasonable expectations. Commodities are not traditional financial assets like stocks, bonds, or even real estate, where investors are paid for the use of their capital and where the risk is limited to the capital invested. An unwary commodities investor can incur a risk many times larger than an initial investment. Commodities do offer good diversification potential, and their long-run returns may be comparable to that of equities; but the robust returns of 2002-2005 are not representative of the long-term returns from this asset category. Already the party for commodities has wound down, with returns in 2006 ranging from +2.0% to -15.1%, depending on the index used to measure returns. Latecomers to commodities are not likely to earn what investors earned from 2002 through 2005.

Endowment managers and trustees need a good understanding of the risk and return dynamics of the asset class. Readers are strongly urged to supplement this article with additional reading. Among the best and most readable recent articles is a Yale International Center for Finance paper by Gary Gorton and K. Geert Rouwenhorst, "Facts and Fantasies about Commodity Futures" (published in the March/April issue of the *Financial Analysts Journal* and available on line through the Social Science Research Network Electronic Paper Collection). We make reference to several findings in this paper later in this article.

The commodities markets are among the oldest and most sophisticated markets in the United States. They grew out of a need by commodity producers and buyers for predictable prices. Whether it's a farmer wanting to lock in a price for his soybean crop or an airline wanting to lock in a price for jet fuel, the commodities markets provide a place where a producer or consumer can reduce or eliminate price risk. A party seeking price certainty trades some profit (or cost-saving) opportunity to a party willing to assume price risk for the foregone profit opportunity. The profit opportunity is essentially a risk premium, and it is this risk premium that is a major source of the returns generated by commodities future index funds. Whether the price of the underlying commodity is going up or down, investors in commodity futures can capture the risk premium. Returns on commodity futures, therefore, are not linked to price movements on the underlying commodity. In fact, returns on commodity futures have significantly outstripped the overall long-term price appreciation on commodities themselves.

> Commodities offer good diversification potential, but the robust returns of 2002 through 2005 are not representative of the long-term returns from commodities.

The rapid increase in the prices of some commodities, such as oil and copper, did contribute to the strong returns from 2002 through 2005, but long-term commodity futures returns are not dependent on price appreciation of the underlying commodity. Many commodities, agricultural in particular, have experienced little or no price appreciation over the past twenty to thirty years.

An investor can participate in the commodities markets in several ways, with significant differences in risk and return. First, one can invest in a managed futures account in which the trading for the account is done by a registered commodity trading advisor (CTA). If one has a large amount to invest (usually more than $1,000,000), the managed futures account could be an individual account. Smaller investors are restricted to limited partnerships where their investments are pooled by a commodity pool operator who would hire CTAs to make trading decisions for the pool.

Endowment managers and trustees should understand that managed futures accounts can be very risky, depending on the objectives of the account. Although the objectives can be customized, they often seek to capitalize on unexpected price changes in the commodity, are leveraged, and can be specialized to specific markets. Since futures contracts do not entail an exchange of cash at inception but rather a deposit of sufficient funds (at a small percentage of the total contract value) to cover potential margin calls if the contract loses value, profits and losses may be several times the initial cash put at risk or "invested." This investment strategy involves much greater risk than investing in funds that are fully collateralized, that is, that require an investment equal to the full value of the futures contract. Reports of commodity returns typically refer to returns on passively managed, fully collateralized futures funds, not from actively managed, leveraged futures accounts. An investment in the latter should not be made with the expectation that it will have the return and risk characteristics of the former. It won't!

The second way to participate in the commodities market is by investing in the stocks of companies that produce commodities, such as mining companies or agricultural producers. An analysis of the stock returns of commodity companies by Gorton and Rouwenhorst, however, shows that they do not have the same favorable risk and return characteristics as returns from a passively managed, fully collateralized commodities futures index fund. Over the period from 1962 to 2003, commodity futures returns were three times the returns on the stocks of comparable companies.

The third way is by investing in a passively managed, fully collateralized commodities futures index fund. These funds do not attempt to capture returns from price movements in the underlying commodity, but rather seek to generate returns from the insurance premium priced into a commodities future contract. If unexpected price movements in the underlying commodity are favorable, the fund may realize a premium return. Conversely, if unexpected price movements are unfavorable, the fund may realize a reduced premium or loss on a

particular contract. Overall, however, by taking positions in a diversified set of commodities future contracts and rolling those positions forward according to a pre-established rule as the near-term contracts are due to expire, the fund realizes an average market premium. Futures positions in the fund are rebalanced periodically in order to maintain a diversified exposure that matches one of several commodity futures indices.

Returns from the funds are not leveraged since the funds are fully collateralized. In other words, investors invest and the funds maintain cash balances equal to the full value of the underlying commodity contracts. Funds in excess of the required margin deposits are invested in short-term Treasury bills adding another component to the fund return. Rather than realizing a gain (or loss) of several times one's investment—as is possible with a leveraged managed futures account—an investor in a commodities futures index fund will realize a return equal to the short-term Treasury bill rate, plus an insurance premium, plus or minus a residual return due to unanticipated price movements in the underlying markets. Over time, the residual return should average to zero.

How big is the historical premium? More than 5.0%! Gorton and Rouwenhorst calculated that a fully collateralized, passively managed fund of commodity futures contracts equally weighted over a diverse set of as many as 34 commodities would have returned an average of 11.02% per year over the forty-five years from July 1959 to March 2004. This return compared to a return of 5.52% on T-bills and an identical return of 11.02% for large-cap U.S. stocks for the same period (average returns are monthly returns annualized). The premium over the T-bill yield was 5.5%. Furthermore, the commodities futures returns showed a negative correlation to stock and bond returns and a positive correlation to inflation, meaning that commodities are an ideal portfolio hedge against periods of poor performance by stocks and bonds.

We can go wrong investing in commodities if we aren't smart about how we do so or if we have unreasonable expectations.

The results of the Gorton and Rouwenhorst study are consistent with the results of other studies of commodities. The only problem with their analysis is that their index is not investable, short of setting up a managed futures account and hiring a CTA to manage the account in accordance with how their index was constructed. Although this might be an option for very large endowments, smaller endowments must rely on funds available in the market today. Fortunately, there are several funds or securities that track commodity futures indices. The PIMCO Commodity Real Return Strategy Fund is benchmarked to the Dow Jones AIG Commodity Total return Index. The Oppenheimer Commodity Strategy Total Return Fund is benchmarked to the Goldman Sachs Commodity Index. Both funds state that they are actively managed and not index funds. However, as the Oppenheimer prospectus states, "The Fund's portfolio managers generally allocate the Fund's commodity-linked investments among a variety of different commodity sectors, based on the weightings of the components of the Fund's benchmark index, the Goldman Sachs Commodity Index." In addition to these funds, Barclays offers two exchange-traded notes (ETNs) that track the Goldman Sachs Total Return Index and the Dow Jones-AIG Commodity Total Return Index respectively.

Since these funds are benchmarked to an index, the choice of a fund comes down to choosing an index. Which index should one choose? Is one better or more representative than another? As we shall see, no one index is best, and the choice depends on how broad or concentrated an exposure we want to the various sectors of the commodities market.

The Goldman Sachs Commodity Index (GSCI) and the Dow Jones-AIG Commodity Index (DJ-AIGCI) are only two of several commodity market indices. The oldest commodity market indices are the Continuous Commodity Index (CCI) and a revised version of the index, the Reuters/Jefferies CRB Commodity Index (RJ-CRB) both of which are successors to the CRB (Commodity Research Bureau) index that originated in 1957. Other indices include the Standard and Poor's Commodity Index, the Rogers International Commodity Index, and the Deutsche Bank Liquid Commodity Index.

The most fundamental difference among the indices is the weighting assigned to the different sectors of the commodity market through how the indices are calculated. The GSCI includes

24 commodities futures contracts and weights them according to the worldwide production of each commodity. The energy sector accounts for more than 70% of this index. The CCI is weighted evenly among 17 commodities. Energy, by contrast, comprises only 17.6% of this index. The DJ-AIGCI index covers 19 commodities. No one commodity can comprise more than 15% or less than 2% of the index, and no sector can comprise more than 33% of the index.

The GSCI is probably the most widely recognized commodity index, but because energy comprises such a large portion of the index, its performance is heavily influenced by the energy sector. Figure COMM.1 shows the comparative total return performance of the GSCI, DJ-AIG, and RJ-CRB indices.

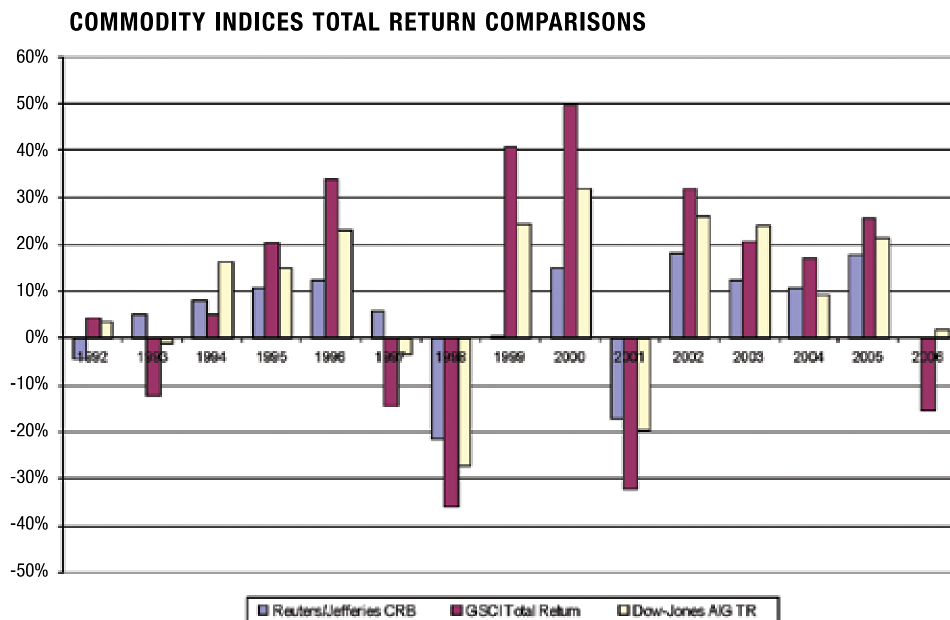

Figure COMM.1: Commodity Indices Total Return Comparisons
Source: Bloomberg, Commodity Research Bureau, and *Advisor* calculations

The GSCI has been the most volatile of the three indices since 1992, and the RJ-CRB index the least volatile, consistent with how heavily weighted any one sector (and energy, in particular) is in each index. Note that 2006 returns for the RJ-CRB index are not included.

Figure COMM.2 compares average returns for the three indices reported in Figure COMM.1 with returns for U.S. large-cap stocks and T-bills. Significant losses in a few years, 1998 and 2001 in particular, reduced both the arithmetic and geometric averages well below the median annual returns for the time period. All indices underperformed U.S. large-cap stocks over the fourteen year period but returned premiums of 1.0% to 5.1% over T-bills depending on the index.

ANNUAL TOTAL RETURN COMPARISONS

	Annual Total Return Comparisons for 1992-2005				
	GSCI	DJ-AIGCI	RJ/CRB	U.S. Large-cap stocks	T-bills
Average (arithmetic)	11.2%	10.3%	5.4%	11.7%	3.8%
Median return	18.8%	15.9%	9.6%	10.4%	3.9%
Geometric average	7.9%	8.8%	4.7%	10.3%	3.7%
Standard deviation	26.4%	17.7%	12.2%	18.0%	1.6%

Figure COMM.2: Annual Total Return Comparisons
Source: Bloomberg, Commodity Research Bureau, Ibbotson, and *Advisor* calculations

What's the outlook for investment returns from commodities?

Although positive returns from a fully collateralized commodities futures index fund are not dependent on rising commodity prices, they are highly correlated to rising prices. Since 1970, the GSCI total return index has increased in only three of the eleven years in which the spot index declined. And curiously, until 2006, the total return index had never declined in a year in which the spot index had increased. Last year was the exception, however, with a loss of 15.1% in the total return index accompanying a 0.4% increase in the spot index. Commodity investors appear to have good reason to be concerned, then, if the prospect for a near-term collapse in commodity prices were likely.

A significant decline in commodity prices appears remote, however, especially now that crude oil, gold, and copper prices have declined from their mid-2006 peaks, which may have been driven more by price speculation and market instability than underlying supply-demand conditions. Global economic growth, particularly in China and emerging markets, will continue to create higher levels of demand for energy and raw materials and put upward pressure on commodity prices, particularly for mined and extracted commodities where demand growth has outstripped production capacity. These conditions, combined with a dollar that is likely to lose value relative to other world currencies, translates into increasing commodity prices on a dollar price basis.

We expect returns of 4.0% over the projected T-bill yield from commodities.

If investors need not be overly concerned about a collapse in commodity prices, they should be concerned about the effects of increased investment in the commodity sector. As has happened with other more traditional financial assets, the glut of worldwide savings has reduced risk premiums and spreads and thereby reduced overall yields relative to historic norms. Will the same thing happen to the commodities market? It is too early to tell, but a prudent portfolio manager would probably be wise not to expect future premiums to be as high as they have been in the past.

For this reason, we set the expected near-term returns from commodities at 4.0% over the projected T-bill yield. This return is from an investment in a passively managed, fully collateralized commodity futures index fund benchmarked to an index such as the GSCI or DJ-AIGCI. The 4.0% premium is modestly discounted from the long-term premium of greater than 5% found by Gorton and Rouwenhorst and at the low end of the range of the premiums produced by the GSCI, DJ-AIGCI, and RJ-CRB total return indices since 1992.

The addition of commodities to the universe of investment options for endowment portfolios has a significantly favorable impact on projected return and risk. (See the article on the Optimally Risky Portfolio for details.) Suffice it to say that adding commodities to an endowment portfolio reduces projected risk while increasing projected return.

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"You'll always be much more than a commodity to me."