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## The Role of Commodities in a Modern, Diversified Portfolio

By

*Mellon Capital Management Research*



### Summary

Recent months have provided a powerful example of the wild price swings that have characterized commodities throughout history. The S&P Goldman Sachs Commodities Index™ (GSCI)<sup>1</sup> climbed 41% over the first six months of this year only to give up 49% over the subsequent four months (July 1 through October 31). Encouraged by the broad and steady climb in commodities prices early this century, an unprecedented number of investors began turning their attention to this alluring asset class. During this run-up, hardly a day went by without a press report about another pension fund, endowment or other sophisticated investor considering a new or enlarged allocation to commodities. In light of the pullback since June, it is reasonable to ask what role, if any, commodities deserve in your investment strategy.

We think commodities can be most valuable to investors as a strategic, long-term allocation within a broad-based financial (stock and bond) portfolio. However, as the recent volatility underscores, it is very important to have a reasonable set of expectations for the asset class. In this paper, we review three common perceptions about commodity returns, and offer our views about their merits:

- Commodity spot returns are going to generate attractive returns in excess of cash over the long term (*not likely, in our view*).
- There is a *consistent* structural risk premium that can be earned from a passive allocation to commodity *futures* (*not likely, in our view*).
- Commodities should provide diversification and downside protection benefits to broad-based portfolios (*the best case for commodities, in our view*).

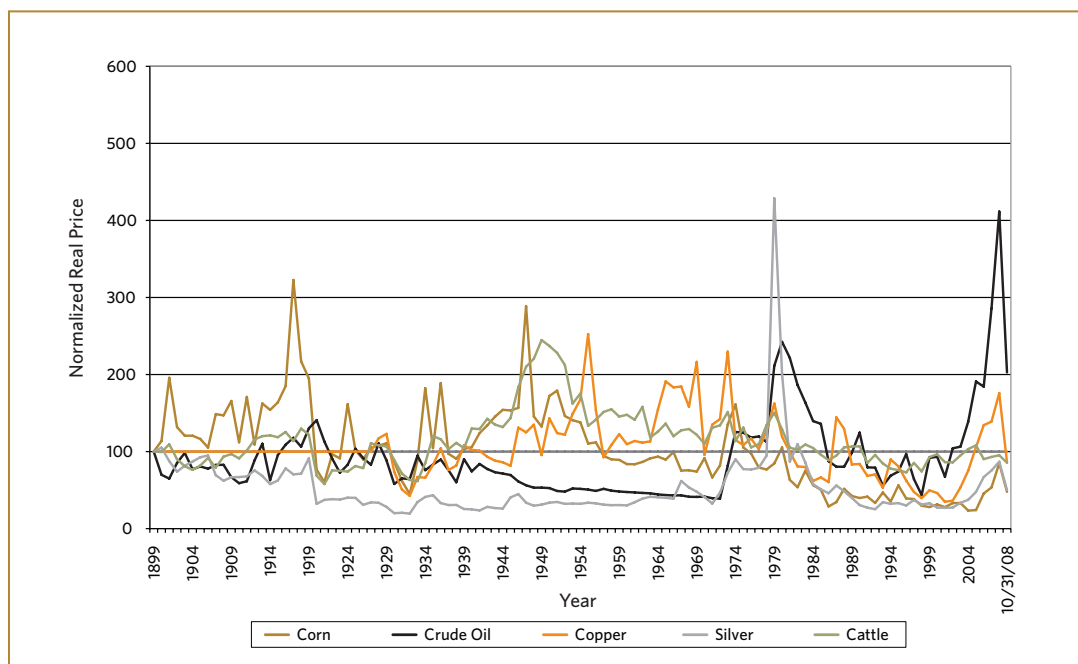
### Is Past Prologue?

Through the five years ended June 30, 2008, the GSCI generated an average annual total return of 21.3%, compared to 7.6% for the S&P 500 and 3.9% for the Lehman Brothers U.S. Aggregate Index. While not *all* commodities registered impressive gains over this period, a vast majority of them did. The breadth and magnitude of these price increases prompted a flurry of papers touting the attractive equity-like return properties of commodities. What many exuberant investors overlooked is the significantly different price pattern that emerges given a more lengthy measurement horizon. Commodity spot prices today, in real terms, are pretty close to where they were in 1900 (Exhibit 1).

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**Exhibit 1 - Real Spot Prices**  
**Dec. 31, 1899 - Oct. 31, 2008** Index: Dec. 31, 1899 = 100

Except for crude oil, prices are pretty close to where they were in 1900.



Source: Global Financial Data, 2008

Depending upon where you stop the clock, it may appear as though performance is quite attractive for one or more commodities. But the longer-term perspective shows more of a path to nowhere with a lot of volatility. As recently as 1999, the cumulative inflation-adjusted returns for all five commodities were negative when measured over the previous century.

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This should not be surprising. Recall that commodities, unlike equities, do not have an “earnings expectation.” They are not enterprises devoted to earning money for shareholders but are driven strictly by supply and demand. While forecasting supply and demand for any particular period can be incredibly complex — witness the debate that rages today over “peak oil” — the basic economic truth still holds: over the long run, supply adjusts to meet demand, or substitutes are found for scarce commodities.

### Bullish and Bearish Views

Following are some commonly cited *bullish* arguments:

1. While a slowing global economy is likely to cool growth in China, India and the rest of the developing world for the near term, they represent a major new source of demand for the long term.
2. The rush of institutional dollars that have poured into commodities since 2001 may slow, but the asset class has gained a spot as a strategic allocation that will likely remain.
3. Investment in production capabilities has been inadequate, so supply has been hampered.
4. Easy sources of supply are quickly diminishing.

**In the span of the past six months, we have experienced both the speculative long demand that helped drive up prices, and the subsequent economic weakening that reversed the trend.**

Some *bearish* arguments that were virtually ignored prior to the mid-year turn in prices include:

1. Historically, over long periods, growth in demand and improvements in technology have tended to cancel out, leaving real prices with no strong up or down trend.
2. Much of the increasing demand that has come from developing nations has been offset by decreasing demand from developed nations. A lot of the commodity processing, or lower tech manufacturing, that used to take place in the U.S. is now taking place in China. So, we really should be focusing on *net* demand, which takes into account a slower pace of economic growth in Japan, Europe and the U.S.
3. Even relatively small shifts in demand can cause dramatic swings in prices. Once commodity prices are high enough to cause “demand destruction,” there is nowhere for them to go except sharply down.

In the span of the past six months, we have experienced both the speculative long demand that helped drive up prices, and the subsequent economic weakening that reversed the trend. Commodities can certainly be used in “trend following” strategies that seek to capitalize on this kind of volatility. But history — including our recent period — is full of examples of just how challenging such timing strategies can be.

### **Commodity Futures Considered**

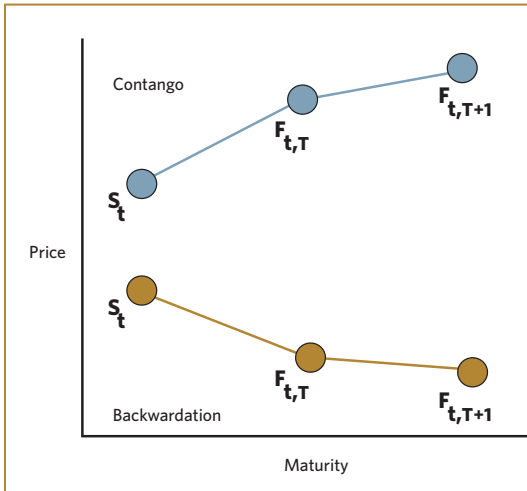
Thus far, we have confined our discussion to the commodities spot market. But the spot, or cash market, is not a practical way to invest in commodities for a typical investor, given the expense and logistics of warehousing goods. Such factors also pose a hurdle to diversifying a commodities allocation, which is desirable because of the high volatility of individual commodities. The futures market does not have these drawbacks and represents an attractive approach to investing in commodities.

Some background on commodity futures basics is very helpful in this regard. Futures markets offer exchange-traded contracts, including some with pricing history in the U.S. that stretches back to the 19th century. They were originally created to give commercial producers and their customers a way to lock in prices at a future time. A wheat farmer in the spring, for example, can hedge to lock in the price he or she gets for the harvest by selling wheat futures for October delivery on the expected production. A cereal producer may find a similar value in going long wheat futures, to add certainty to near-term production costs.

Because supply and demand dynamics and holding costs differ between the futures market and the spot, the two markets usually trade at different prices. However, as any given futures contract approaches expiration, its price converges with the spot market. To see how these price dynamics can benefit a futures market investor, consider this scenario. On May 1, the spot price of a commodity is \$40, but an investor can buy the same commodity for \$37 with a futures

contract that expires Aug. 31. Let's assume that market participants are expecting seasonal factors to put downward pressure on the spot price over the next four months so that the spot price will fall from \$40 to \$38 between May 1 and Aug. 31. The difference between the futures price of \$37 and the expected future spot price of \$38 is \$1. This \$1 represents the risk premium a futures investor would expect to earn in exchange for taking on short-term price risk. The realized risk premium may be higher/lower depending upon whether the spot price on Aug. 31 is higher/lower than the \$38 forecast.

**Exhibit 2 - Term Structure of Futures Prices**



Source: Mellon Capital Management Corporation

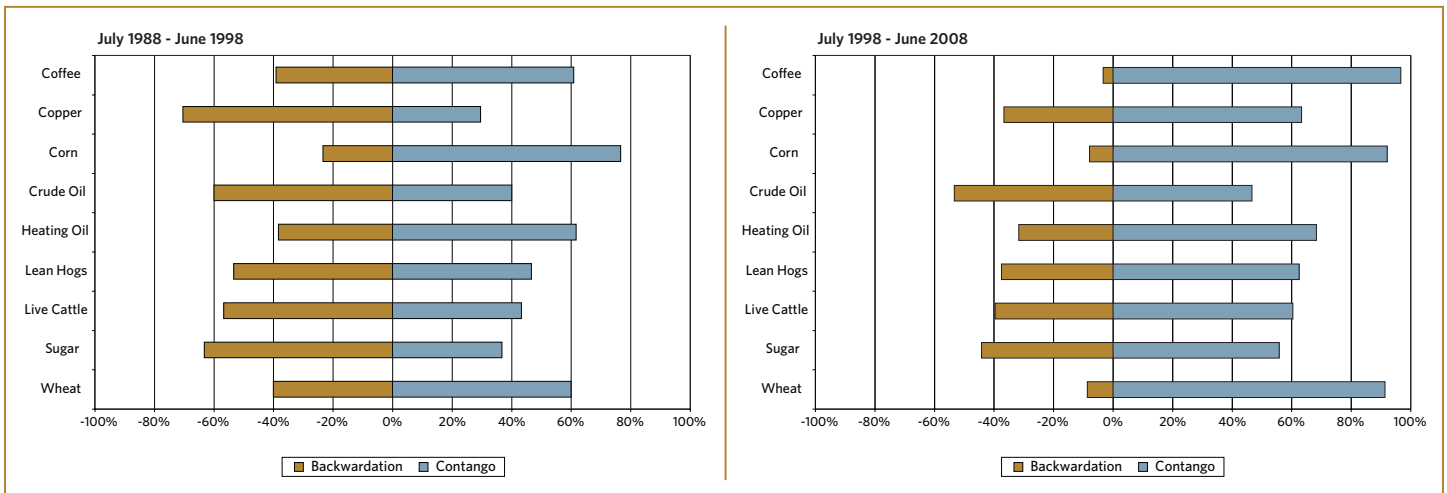
The common futures industry term for the scenario on May 1 (when the futures price is below the prevailing spot price) is “backwardation,” and is graphically depicted as a downward sloping forward price curve (Exhibit 2). John Maynard Keynes introduced the term “normal backwardation” in the 1920’s to describe the scenario where futures contracts are priced below *expected* future spot prices. If one assumes a commodity market will typically be in normal backwardation, then investors can “roll” from one expiring futures contract to the next, while reaping the premium each time. The equation for the investor is:

$$\text{Cash return (earned on a fully collateralized position)} \\ + \text{roll return} + \text{spot return} = \text{futures return}$$

The opposite case, where the futures investor pays a higher price than available in the spot market, is known as “contango” (Exhibit 2), and can result in lower returns for the futures investor versus the spot market. In other words, the roll return becomes a negative factor in the equation above.

Unfortunately, backwardated markets are becoming less common for most commodities, as shown in Exhibit 3, which compares the past 10 years with the previous 10 years. The earlier period shows a roughly even breakdown for periods in backwardation and contango. The more recent period shows a distinct migration for most commodities toward a greater percentage of time spent in contango.

**Exhibit 3 - Frequency of Backwardated and Contango Markets**



Source: Commodity Research Bureau Monthly Returns.

Bars may not sum to 100% because unclear months have been excluded.

**Given the historical track record of commodities as a volatile “path to nowhere,” there is little reason to expect a return in excess of cash over the long term. The increasing prevalence of contango markets (upward sloping forward price curves) reinforces this view for today’s futures investor.**

If we examine the return of the commodities in the S&P GSCI over the past 5.5 years, we see that the roll has been a negative factor for the past four (Exhibit 4). It is shaping up to be negative once again in 2008, although only modestly so (-1% through June 30, 2008).

**Exhibit 4 - S&P GSCI Return Decomposition**

	2003	2004	2005	2006	2007	1H 2008
Excess Return	19%	16%	22%	-19%	27%	40%
Spot Return	11%	19%	39%	0%	41%	41%
Roll Return	9%	-4%	-17%	-20%	-14%	-1%

Source: Goldman Sachs

What explains the trend toward contango? The most commonly accepted explanation is the entrance of more non-commercial, speculative interests (mostly on the long side), relative to commercial users, who tend to be on the short side. Recall our wheat farmer, who uses the futures market as a source of insurance to hedge, or lock in, the crop’s price down the road. To the extent the farmers are more prevalent in the market than long-side buyers, the premium for that insurance will tend to increase and help produce a backwardated market — the futures price will be below expected spot.

However, as we noted at the start of this paper, commodities have drawn tremendous interest in recent years from the investment community. Assets allocated to commodity index strategies increased from less than \$10 billion in 2001 to well over \$200 billion in 2008, according to industry estimates. This is a significant commitment and represents something close to one-third of total commodity futures open interest. Index investor positions are almost entirely long and will tend to bid up the price of futures, potentially contributing to contango.

The bottom line is that commodities investors who look to passive futures allocations to consistently add some “pop” to expected returns are likely to be disappointed. They may, in fact, witness the reverse — a persistent drag on performance relative to spot returns due to negative roll returns.

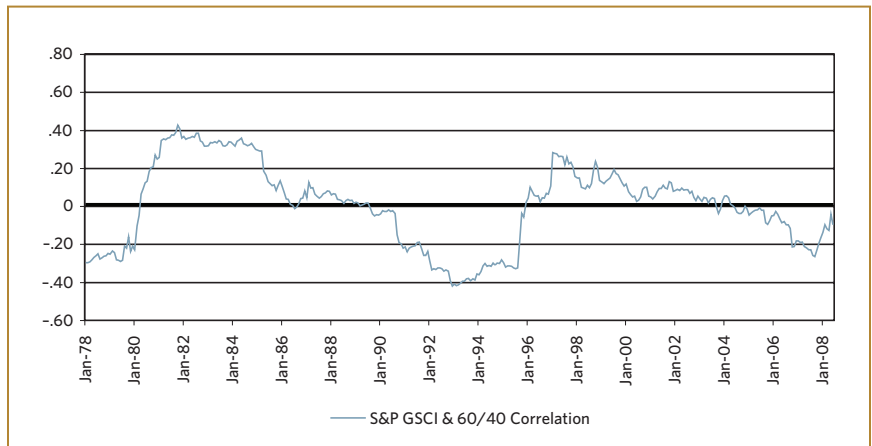
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### **Commodities as a Diversifier**

The role of commodities in a modern, diversified portfolio is a more positive story. Consider the rolling five-year correlations between the S&P GSCI and a domestic 60% S&P 500 / 40% Lehman Aggregate portfolio (Exhibit 5). The greatest degree of positive correlation over the past 35 years was 0.40. Most of the correlations are significantly lower than that, reaching negative 0.40. Energy commodities exhibit the most consistently negative correlations with stocks and bonds.

**Exhibit 5 - Rolling 5-Year Correlations Between the S&P GSCI and a Domestic 60% S&P 500 / 40% Lehman Aggregate Portfolio**

**Historically, commodities have tended to perform well during periods of increasing inflation and times of geopolitical unrest, such as when tensions are rising in the Middle East.**



Source: Goldman Sachs

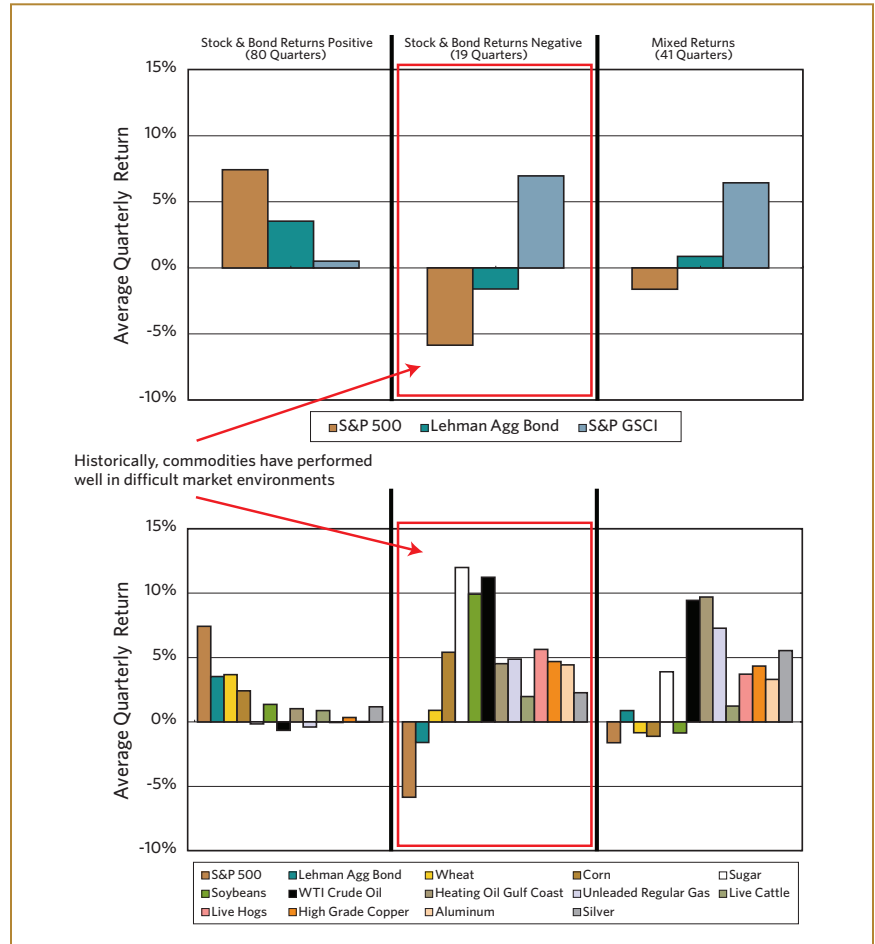
The good news, which is not reflected in aggregate correlation statistics, is that commodities tend to be negatively correlated when you *want* them to be. Over the past 140 quarters (35 years), there were 19 showing negative returns for both stocks and bonds. During those 19 quarters, the S&P GSCI total return index posted a positive return of about 7% on average (Exhibit 6). During the 80 quarters when stocks and bonds posted positive returns, the S&P GSCI was flat. It should be noted that the S&P GSCI total return series is based on the *futures* returns of the underlying index constituents. Therefore, roll returns are factored in as well as changes in spot prices.

The bottom half of Exhibit 6 shows the same period, displaying individual spot commodities. Given that we are referencing spot returns here, any influence due to roll returns or futures mispricing relative to spot is taken out of the equation. Each of the commodities had positive performance during the quarters when both stock and bond returns were negative. The positive performance ranged from just below 1% for wheat to 12% for sugar. The bottom line is that commodities added significantly to portfolio performance during the down quarters for stocks and bonds, while imposing negligible drag on the portfolio during the up ones — in other words, they served as a great protective diversifier.

Much of this can be explained by asset class behavior during periods of increasing inflation. Stocks and bonds generally respond poorly to increasing inflation, while commodities perform well in this environment. That said, inflation is not the whole story. Historically, commodities have tended to perform well during periods of geopolitical unrest, such as when tensions are rising in the Middle East.

## Exhibit 6 – Commodity Returns in Different Market Environments, 1973-2007

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Source: Goldman Sachs

The divergence in asset class performance highlighted above is not historical happenstance. Since commodity price behavior often serves as a leading indicator of broader inflation, central banks around the world institute policy decisions in response to these price movements in an attempt to dampen inflationary pressures. As central banks tighten and interest rates increase, this usually prompts a sell-off in both stock and bond markets.

The financial turmoil we have experienced since August 2007 is a good case study in what can be reasonably expected of commodities as a diversifier. Recall that during the initial stages of the crisis in September 2007, issues of creditworthiness and solvency of major financial institutions were of paramount concern. Gold, as a classic “store of value,” advanced from about \$700 an ounce to over \$1,000. Copper fluctuated in the fall of 2007 from a base of about \$300 an ounce until it peaked in July at about \$400.

By July 2008, as the global liquidity crisis became more acute and concerns regarding the severity of the economic downturn escalated, commodity returns became much more highly correlated with the broader equity market as a flight to safety drove down prices on risky assets *en masse*. Recessions are deflationary, so it is reasonable to expect commodities to lose value in this environment, along with financial assets. This does not undermine, in our minds, the value commodities are likely to provide as a diversifier in the future, as they have done so frequently in the past.

## Conclusion

Nothing in the long-term history of commodity prices — up to and including recent experience — suggests that, as a group, they will produce equity-like returns going forward. To the contrary, the strong performance of recent years made near-term mean reversion more likely. Additionally, the impressive roll returns earned by commodity futures investors in the past are likely to be less rewarding going forward as more speculators enter the marketplace.

Commodities are best used in a modern diversified portfolio as a strategic protective asset against the various shocks that periodically buffet financial markets. From a broader perspective, we believe that diversification with commodities should be considered as part of a strategic portfolio mix that goes beyond the traditional 60/40 stock/bond allocations and achieves exposure to a wider set of risk premiums. We will explore this kind of portfolio in a subsequent paper.

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