



Cracking the Commodities Code:

A Fundamental Approach to
Harvesting Alpha Opportunities

By

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Introduction

For most of modern investing history, commodities have made just minor inroads as a mainstream institutional investment. On the periphery, there have always been some who were comfortable with the jargon of crop, crack, and spark spreads and crushes. But for the most part, commodities traditionally have been seen as an asset class that is too volatile and speculative for prudently managed portfolios, with dubious potential as a consistent source of alpha.

The skepticism of the traditional view is understandable. At times, commodities are volatile and have suffered from extended periods of low returns. However, even skeptics acknowledge that an unmanaged index of commodities can be a good portfolio diversifier with a record of uncorrelated performance during equity market downturns, and of consistent performance as an inflation hedge.¹

Mellon Capital has developed a systematic, fundamental approach to commodities investing that we believe can enhance the attractiveness of the asset class while mitigating its drawbacks. We believe that commodity-portfolio returns potentially can be improved by over and under weighting (or, when appropriate, short selling) commodities based on a set of economically grounded attractiveness scores. These scores take into account inventory shortage, hedging pressure, smart money flow, price and macroeconomic trends, the shape of the futures curve, and other factors. This approach can be implemented through a number of methods, such as providing an improved beta hedge in diversified portfolios, or as a way to seek alpha opportunities in stand-alone strategies.

The Problem with Passive Approaches

Before discussing the potential of active commodities management, we first need to consider what is reasonable to expect from index investing. For commodity indices, the track record is unambiguously disappointing. As stand-alone passive portfolios, *long-only* commodity indices have high volatility and low Sharpe² ratios (Exhibit 1). Almost any long-only passively weighted index — such as the S&P Goldman Sachs Commodities Index (GSCISM), or the Dow Jones-UBS Commodities Index (DJ-UBSCI) — has a 20-year Sharpe ratio of less than 0.5.

¹ For an in-depth discussion of the potential benefits of commodity beta, see *The Role of Commodities in a Modern, Diversified Portfolio*, (November 2008) by Mellon Capital Management.

² For a description of Sharpe ratios please see page 14.

Exhibit 1: Passive commodity indexes have poor risk-adjusted returns.

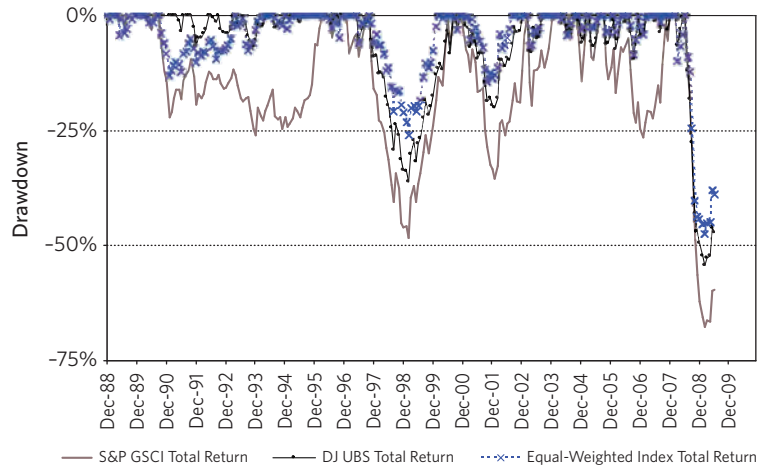
Returns	1 yr	3 yrs	5 yrs	10 yrs	20 yrs
S&P GSCI	-78.3%	-10.3%	1.3%	9.8%	7.5%
DJ UBS	-56.8%	-5.0%	2.4%	8.8%	6.5%
Equal wgted long-only	-44.2%	3.2%	8.0%	11.8%	8.4%
Standard Deviation	1 yr	3 yrs	5 yrs	10 yrs	20 yrs
S&P GSCI	41%	32%	29%	25%	22%
DJ UBS	30%	24%	21%	17%	15%
Equal wgted long-only	30%	24%	20%	16%	13%
Sharpe Ratio	1 yr	3 yrs	5 yrs	10 yrs	20 yrs
S&P GSCI	-1.94	-0.44	-0.07	0.25	0.15
DJ UBS	-1.96	-0.36	-0.05	0.31	0.17
Equal wgted long-only	-1.54	-0.02	-0.23	0.53	0.31

Data Source: Thomson Reuters Datastream, Bloomberg, and Mellon Capital Management calculation ending 6/30/2009.

Some investors attribute the volatility of the commodity indices to the energy sector, but the facts show otherwise.

The commodities indices have also been prone to big up and down cycles that have produced large, prolonged losing spells, with recovery periods that take years. For example, GSCI had one downturn that started in 1989 and lasted until 1995, and another from 1998 to 2000 (Exhibit 2). The recent tailspins of both the GSCI and the DJ-UBSCI, each in excess of 50%, are fresh in many investors' memories. Low points for the GSCI have gotten progressively lower: -25% in 1992, -50% in 1998 and -70% in 2008.

Exhibit 2: Over the past 20 years, losing periods of most passive long-only commodity futures indices have been substantial and long-lasting.



Data Source: Thomson Reuters Datastream and Mellon Capital Management calculation.

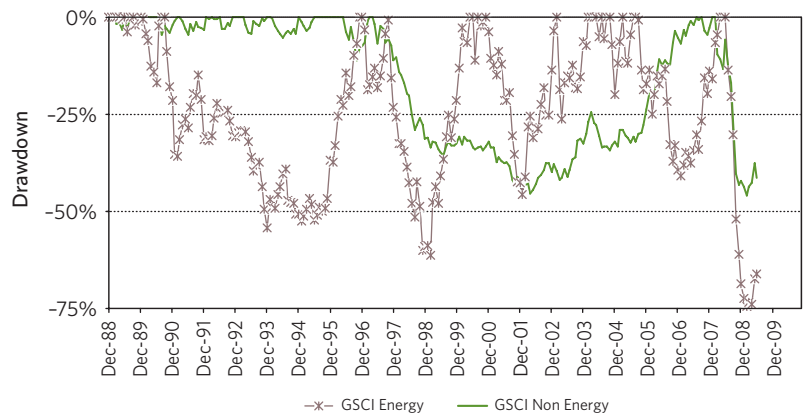
Some investors attribute the volatility of the commodity indices to the energy sector, but the facts show otherwise. The GSCI Non-Energy Index exhibits similarly deep and prolonged downturns (Exhibit 3). Taking the drastic step of excluding energies altogether from the GSCI does not mitigate the painful losing stretches. For example, from 1996 to 2006, the GSCI Non-Energy Index, had a miserable decade that started in 1996, bottomed out at -45% in 2001, and didn't recoup its losses until 2006.

This review of passive commodities investing is not meant to imply that such an approach cannot be a useful tool as a beta hedge in overall portfolio

diversification — our earlier study (footnote 1) demonstrated otherwise. But clearly, an active strategy that could mitigate some of the downside volatility, while preserving the countercyclical pattern, would be of great value.

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Exhibit 3: Even excluding the volatile energy sector, commodities still have suffered large downturns.



Data Source: Thomson Reuters Datastream and Mellon Capital Management calculation.

Going Active in Commodities

In his classic 1965 paper, Nobel Prize winning economist Paul Samuelson issued a famous paean to market efficiency:

*"[T]here is no way of making an expected profit by extrapolating past changes in the futures price, by chart or any other esoteric devices of magic or mathematics. The market quotation already contains in itself all that can be known about the future and in that sense has discounted future contingencies as much as is humanly possible."*³

It isn't our intent to rebut Samuelson, or to otherwise wade into the academic debate about market efficiency. We raise the topic simply to acknowledge that there is good reason to be skeptical about an active strategy that purports to uncover alpha opportunities on a consistent basis. We address this skepticism at the "nuts and bolts" level: first by outlining indicators that we believe help capture alpha, and then by reviewing some of the unique characteristics of commodities markets that help produce — and sustain — these opportunities.

One issue to keep in mind is that the distinction between commodity "alpha" and skillfully harvested commodity risk premium (sometimes called "beta") is one of semantics. In this paper, we refer to all returns that require active skillful rebalancing as "alphas" even if they may be a form of risk premium that can only be unlocked by positioning portfolios properly to track the seasonal ebbs and flows of commodity-level production or consumption.

Because they rely on skill and expertise to harvest, such alpha returns should not be lumped together with beta returns from passive indexation even if both enjoy the benefits of earning risk premium.

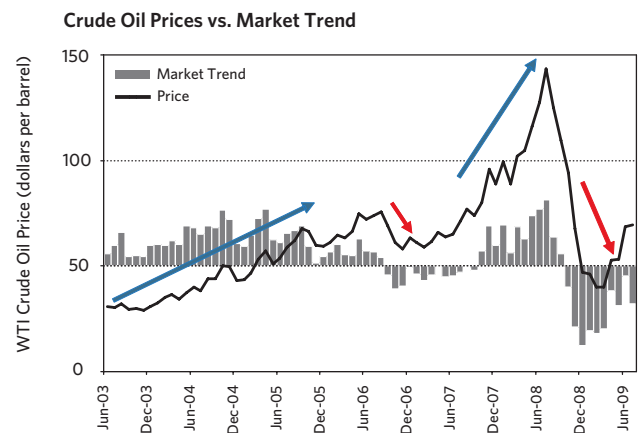
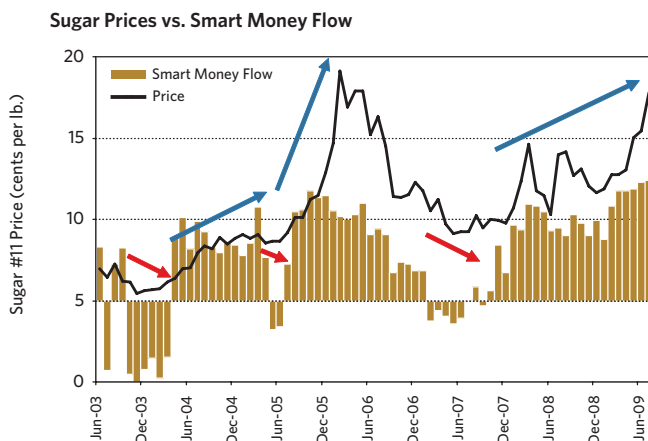
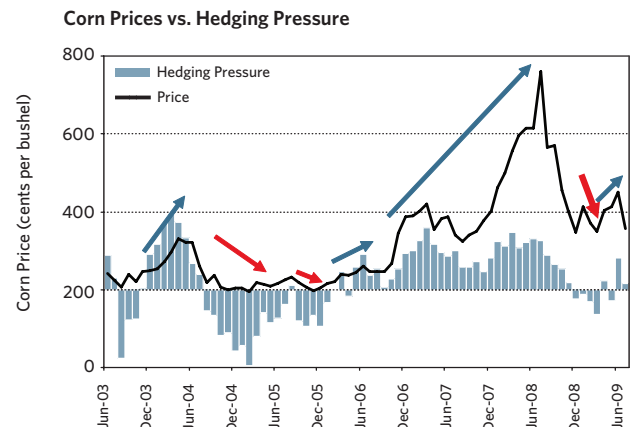
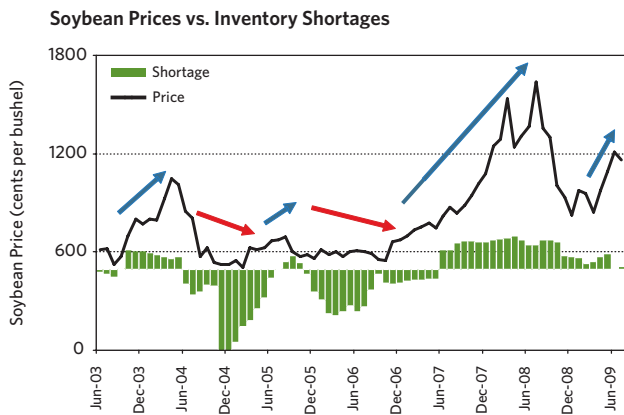
³ Paul Samuelson, "Proof that Properly Anticipated Prices Fluctuate Randomly," *Industrial Management Review* 6.2, 41-49 (1965).

We will focus on strategies that involve taking active commodity positions based on economic information about individual commodities. For the purposes of this article, “economic information” consists of news about supply and demand imbalances in commodity spot markets as well as commercial and speculative activity in the commodity futures markets.

Anticipating intermediate- or long-term commodity price trends is a formidable task that is tied to production and consumption dynamics, which fluctuate with global business cycles. Fortunately, in our view, one can sidestep the need for accurate long-run projections by seeking to anticipate short-term relative price movements and rebalancing portfolios once a month based on one-month-ahead expectations.

Our research indicates that a small set of fundamental and market-based indicators can potentially be month-ahead leading indicators of commodity-price movements with sufficient accuracy to capture some potential alpha. This article focuses on four representative indicators: inventory shortage, commercial hedging pressure, smart-money flow, and 12-month price trend. We have found that, historically, these indicators, both individually and collectively, have correlated well with the price movement of most commodities.⁴ To illustrate individual relationships, we picked four commodities and paired each one, more or less at random, with an indicator as shown in Exhibit 4.

Exhibit 4: (Blue up arrows indicate when the indicator forecasts rising prices and red down arrows indicate when the indicators anticipate downward price pressure.)



Data Source: Proprietary Mellon Capital Management calculations using data from Thomson Reuters Datastream, Bloomberg, and the Commodity Futures Trading Commission.

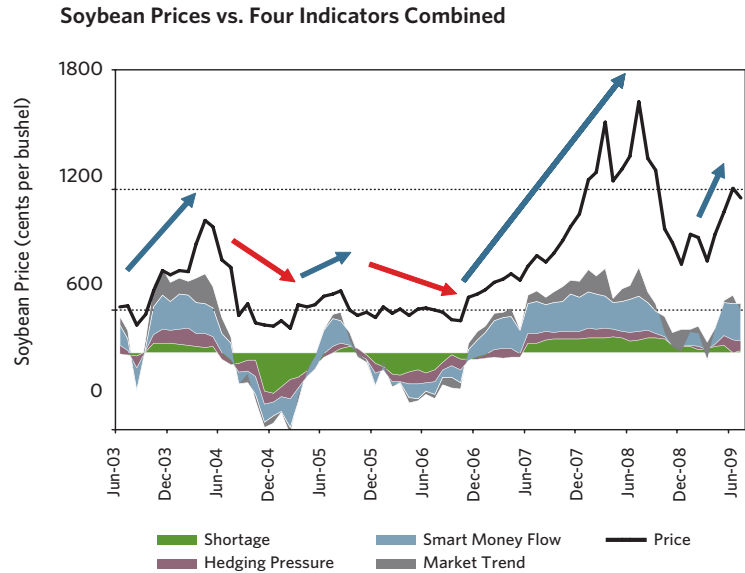
⁴ The inventory shortage indicator is based on warehouse data and U.S. government statistics. We compute the commercial hedging pressure and smart money flow based on the CFTC’s weekly commitment of trader’s reports. The 12-month price trend indicator is estimated from historical futures prices, and helps to identify when prices are moving in response to underlying disequilibrium in the commodity market.

As noted, there is nothing special or unique about the pairings shown in Exhibit 4. Despite the disparate economic origins of the indicators, our research finds that they have generally agreed with each other a majority of the time for most commodities, as we illustrate for soybean prices (Exhibit 5). In our research, all four indicators have agreed in their directional information roughly 80-90% of the time over extended periods. Combining these indicators yields an aggregate “attractiveness score” that has been more reliable than the component indicators individually.

Next we turn to a review of the economic underpinnings of the commodities markets, to help explain not just why the indicators have been effective, but why we believe they will continue to be so in the future.

Exhibit 5

The four indicators have usually agreed on price direction, and combining them produces an “attractiveness score” that has been more reliable than any one individually.



Data Source: Proprietary Mellon Capital Management calculations using data from Thomson Reuters Datastream, Bloomberg, and the Commodity Futures Trading Commission.

Why Do Alpha Opportunities Persist in Commodities Markets?

There are three structural aspects of the commodities markets that set them apart from most financial assets, and create opportunities for alpha:

1. Commodity **spot** prices are determined by producers and consumers transacting in physical commodities — not financial exchanges.
2. Inventory shortages caused by a demand surge or a production shortfall require a substantial adjustment period, which can take as long as one or more production and consumption cycles to correct.
3. Commodity **futures** provide alpha opportunities to investors because large commercial players in these markets transact commodity futures primarily to hedge operating risks, not to seek alpha or beta.

We will elaborate on each, in turn.

Any supply or demand shock that unexpectedly draws down inventories will typically cause and sustain higher spot prices until production or demand destruction corrects the inventory shortage.

Spot Markets

Spot markets are where merchants buy and sell physical commodities for immediate delivery. Five economic factors determine commodity prices in spot markets:

- a. **Contemporaneous** supply and demand.
- b. Anticipated **future** supply and demand.⁵ If a commodity is storable, then owners would not sell at a price (net of storage costs) lower than what they can get later.
- c. **Storability.**⁶ Storability determines whether producers can build up reserves to buffer against future shortages. For example, storage capacity limits how much crude and refined oils can be stored.
- d. **Substitutability.** When the price of a commodity rises sufficiently above a substitute, consumers begin to switch out of the initial commodity into the substitute. Mutual substitutes include cattle and hogs; heating oil and natural gas; and crude oil and bitumen from the Canadian tar sands.
- e. **Depletability.** When owners of storable but depletable resources like fossil fuels and metals sell today, they surrender the opportunity to sell later at potentially higher prices. To entice owners to sell sooner, such resources command a “depletion premium.” Even if actual depletion may be decades away, today’s prices may incorporate a depletion premium analogous to how expected long-run growth potential affects today’s stock prices.

If inventory holders believe that their commodity holdings will rise in price faster than the cost of storage, it would make sense for them to store and sell the commodity later at a higher price. Hence, a commodity’s degree of storability links expected future supply and demand to its current spot price. Accordingly, sometimes a spot price may rise, not because of a current shortage, but because of an expected shortage in the future. Shelf life limits and storage costs dampen the size of this type of forward-looking storage arbitrage. Commodities are storable to varying degrees. Agricultural, livestock, softs, and some energies have limited shelf lives while electricity cannot be stored at all.

Inventory Shortages

Shortage-rooted price spikes may persist for months. While holders of physical commodities (i.e., those who are long the physical) can choose to store surplus inventory, there is no symmetrical short position — even in the presence of a shortage, they cannot borrow non-existent inventory from the future to sell in the current spot market. As a result, any supply or demand shock that unexpectedly draws down inventories will typically cause and sustain higher spot prices until production or demand destruction corrects the inventory shortage.

5 For example, David Hirshleifer, “Hedging Pressure and futures price movements in a general equilibrium model,” *Econometrica* 58.2, 411-428 (1990).

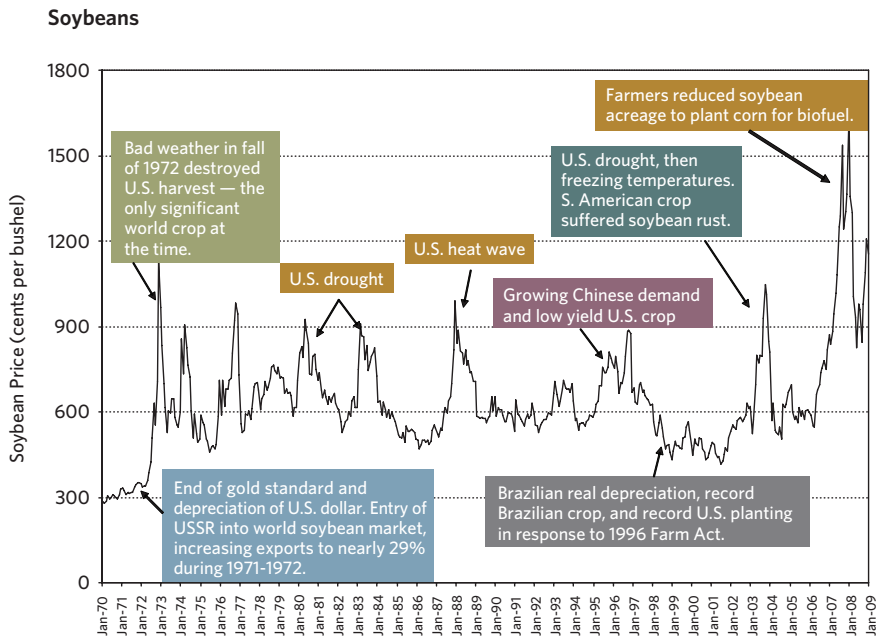
6 For example, Angus Deaton and Guy Laroque, “Competitive Storage and Commodity Price Dynamics,” *Journal of Political Economy* 104.5, 896-923 (1996).

Since demand for many commodities like basic foodstuffs, raw materials, and fuel rarely declines significantly, it is usually up to production to alleviate shortages. If production is seasonal or costly to adjust — as is the case for all drilled, mined, or farmed commodities — alleviating shortages and restoring pre-shortage price levels could take months or, in extreme cases, even years.⁷

Following price spikes, soybean prices tend to revert back to pre-spike levels after an adjustment period, often lasting one or two production cycles.

If we examine the price history of the front soybean futures contract back to 1970, we see price spikes that are attributable to shortages caused by either harvest shortfalls or demand surges (Exhibit 6). The ability for consumers to substitute out of soybeans into wheat or corn places a soft ceiling on the size and duration of price peaks. Following price spikes, soybean prices tend to revert back to pre-spike levels after an adjustment period, often lasting one or two production cycles. Noticeably absent from Exhibit 6 are price valleys where soybean prices drop substantially below about \$5 per bushel. Sharp price valleys are rare because producers, quite rationally, would choose to store soybeans rather than give away inventory below the marginal cost of production and storage. Because price peaks occur more frequently than price valleys, the return distribution of soybeans is leptokurtic — i.e., the curve is peaked due to the greater frequency of higher values.

Exhibit 6: Price spikes of the front soybean futures contract are attributable to a variety of events. Following a spike, soybean prices tend to revert back to pre-spike levels.



Data Source: Mellon Capital Management calculation based on futures prices from Thomson Reuters and information from USDA, Economic Research Service.

7 For example, Sherwin Rosen, Kevin Murphy, and José Scheinkman, “Cattle cycles”, *Journal of Political Economy* 102 (3), pp. 468-492 (1994).

Because production and adjustment periods are cyclical and seasonal and vary on an individual-commodity basis, passive long-only commodity futures portfolios are unable to fully capture such operating risks.

Futures Markets

In commodity futures markets, the large participants — producers, processors, and consumers — trade futures contracts to hedge their own inventory risk or to procure physical deliveries. For example, farmers sell futures contracts to lock in a price for their crops. Airlines and food processing companies buy futures contracts to lock in the price of fuel and raw materials. These participants use futures markets as a supply chain and risk management tool, not to capture alpha or beta. As a result, their futures trading activity transfers operating risks from their product market into futures markets.

Keynes and Hicks suggested early in the 20th century that commodity futures prices reflect a risk premium that commercial participants pay to speculators to entice them to become counterparties. That is, by sharing in some of the operating risks faced by producers, processors, and consumers, speculators in commodity futures might earn a risk premium. In this sense, commodities futures portfolios — at least those that are properly constructed to share operating risks — are a potential new source of risk premium returns. Because production and adjustment periods are cyclical and seasonal and vary on an individual-commodity basis, passive long-only commodity futures portfolios are unable to fully capture such operating risks. Only skillfully managed futures portfolios can unlock and fully capture this source of risk premium.

Economics of Commodity Positions

Mellon Capital has decades of experience in global tactical asset allocation using a variety of assets, including stocks, bonds, and futures, more recently, commodity futures. Our experience teaches that a variety of key global and local economic factors can move asset prices. Exhibit 7 indicates that metals, meat, and energy are strongly linked to macro- or business-cycle factors while agricultural and soft-commodity prices are more affected by commodity-specific factors. This is because demand for basic foodstuffs — necessities of life — does not vary as much from year to year as demand for discretionary “luxuries” like jewelry, meat, investment in new housing, or business activity. While variable demand for biofuels and other indirect channels do cause demand for agricultural and soft commodities to vary somewhat with business cycle fluctuations, supply shocks (such as bad weather or disease) play a greater role in determining the prices of agricultural and soft products.

Exhibit 7: Commodities vary in their exposure to different economic factors and events.

Commodity Sectors	Examples	Economic exposure to:
Industrial metals	aluminum, copper, nickel, lead, zinc, silver, palladium, platinum	Construction, housing starts, industrial activity and China growth, infrastructure investment, consumer spending
Precious metals	gold, silver, palladium, platinum	Inflation expectations, real interest rates, U.S. dollar, central banks' gold policies, jewelry demand
Softs	world sugar, cotton, coffee, cocoa	Growing conditions (temperature, weather, political activity) in South America, Africa, southern and southeast Asia, and Australia
Agriculture	wheat, corn, soybeans, soy meal, soy oil	South-American, Asian, and American weather, bio fuel demand, disease, insects, government farm subsidies and import-export restrictions
Livestock or meat	feeder cattle, live cattle, lean hogs, frozen pork bellies	Business-cycle-rooted consumer meat demand, seasonal cost of farm feed and heating, disease and weather
Energy	WTI crude oil, Brent crude oil, natural gas, heating oil, RBOB gasoline, gas oil (distillate)	Business cycle (impact on industrial and consumer usage), China growth, consumer sentiment, credit availability (for refiners and drillers), hurricanes (impact on refineries and distribution), temperature (impact on demand) U.S. dollar, political stability of oil exporters

Data Source: Mellon Capital Management

We have seen that a variety of unpredictable macro and micro economic forces continually buffet commodities markets.

Our research shows that the indicators have worked because they are summary statistics that capture the impact of a wide range of economic factors. For example, unexpected bad weather or political instability disrupts crop development and harvesting, which causes lower inventories. Reduced industrial activity or consumer spending reduces demand and causes inventory builds. Thus, the inventory-shortage indicator acts as a proxy for events that affect supply and demand. Similarly, the hedging pressure, smart money, and market trend indicators are proxies for the response of futures-market participants to weather, politics, disease, and other underlying developments.

Popular Designer Trades

We have seen that a variety of unpredictable macro and micro economic forces continually buffet commodities markets. Those forces, combined with the physical constraints and structural peculiarities unique to different commodities, provide an ongoing source of potential alpha opportunities and Keynesian risk premium. These opportunities seem resistant to being completely “arbitraged away” as typically happens in reference to financial assets. It is not surprising, then, that many “designer trades” have evolved to make it easier for commodity-market participants and speculators to take positions on these opportunities. Mellon Capital will normally implement diversified portfolios of such trades with timing and execution guided by such indicators as those we have reviewed. The trades can be sophisticated, but the details aren’t the main point of our discussion. We simply wish to highlight the numerous possibilities for investors.

Exhibit 8 starts with a simple one — a one-contract long position on gold futures. A long position might be established to hedge against expected inflation or major-currency depreciation.

More typical of designer trades are spread positions, in which the investor simultaneously goes long one commodity while shorting another. The goal is to profit from the change in the relative prices of the two commodities. The long-short feature of the spread position hedges the investor against one or more shared economic risk factors. Some examples should help clarify this point.

Exhibit 8: Some representative commodity trades. This is not a comprehensive list and excludes spark spreads, frac spreads, and spread options and is shown only for illustration purposes.

Positions	Example	Potential economic exposure
futures contract	Buy 1 gold	Expected inflation or U.S. dollar depreciation
WTI – Brent spread	Buy (sell) 1 WTI crude oil, sell (buy) 1 Brent crude oil	U.S. crude oil supply and demand relative to world supply and demand
crack spread	Buy 1 heating oil, sell 1 crude oil	Profitability of refining crude oil
	Buy 1 gasoline, sell 1 crude oil	
1:2:3 crack spread	Buy 1 heating oil and 2 gasoline, sell 3 crude oil	
1:1:1 soybean crush	Buy 1 soy meal and 1 soy oil, sell 1 soybean	Profitability of soybean processing
8:4:3 cattle crush	Buy 8 October live-cattle, sell 4 May feeder-cattle and sell 3 July corn	Profitability of fattening feeder cattle
bull calendar spread	Buy 1 near soybean, sell 1 deferred soybean	Near-term spot price spikes caused by inventory shortages or hedging activity
old crop – new crop calendar spread	Buy 1 Nov soybean, sell 1 August soybean	Inventory shortage of old crop prior to harvest of new crop

Data Source: Mellon Capital Management analysis and *Derivatives and Risk Management in the Petroleum, Natural Gas, and Electricity Industries*, publication of the Energy Information Agency, U.S. Department of Energy.

Investors who are bullish on the near-term prospects for a commodity, but want to reduce the risk from factors that might affect its long-term price, can use calendar spreads.

West Texas Intermediate (WTI) crude oil is an important source for meeting U.S. domestic demand, and its price is typically more sensitive to the U.S. economy than oil produced elsewhere, such as Brent crude, which comes from the North Sea. Going into 2009, an investor with the view that the U.S. crude inventories were likely to build up more than international inventories could have played the WTI-Brent spread by shorting WTI and going long Brent. WTI is slightly easier to process and usually trades at a slight premium above Brent. Such a trade could have indeed been profitable, as the WTI-Brent spread actually became negative in 2009 (i.e., the shorted WTI lost value and/or Brent, the long position, gained value).

An important point here is that the investor in this spread was indifferent to economic factors that affected the global price of oil, because they would have affected both long and short positions equally. Thus, the investor has hedged against broad exposure to oil, while seeking to profit from the changing relationship between WTI and Brent.

Another oil play — the “1:2:3 crack spread” (launched by Nymex in 1994) — seeks to capitalize on changing relationships between the price of oil and refined products. A long position on this crack spread is equivalent to buying 10,000 barrels of heating oil and 20,000 barrels of gasoline and selling 30,000 barrels of crude oil. The trade is designed to profit from an improvement in oil refineries’ profit margins (the difference between the price of crude oil and the prices of refined products). Like the WTI-Brent spread, the investor would be indifferent to oil-related economic factors that affect both crude and refined products.

Investors who are bullish on the near-term prospects for a commodity, but want to reduce the risk from factors that might affect its long-term price, can use calendar spreads. A “bull spread” involves buying a near futures contract and simultaneously selling a farther out contract on the same commodity. Near contracts are more sensitive than deferred contracts to short-term spot price moves, so the bull spread is essentially a bet that spot prices will run up before the near contract stop trading. (A bear calendar spread can be established by reversing the positions.) Also, because bull and bear spreads are exposed to only short-term price movements, they tend to be less sensitive than one-contract futures positions on the same commodity.

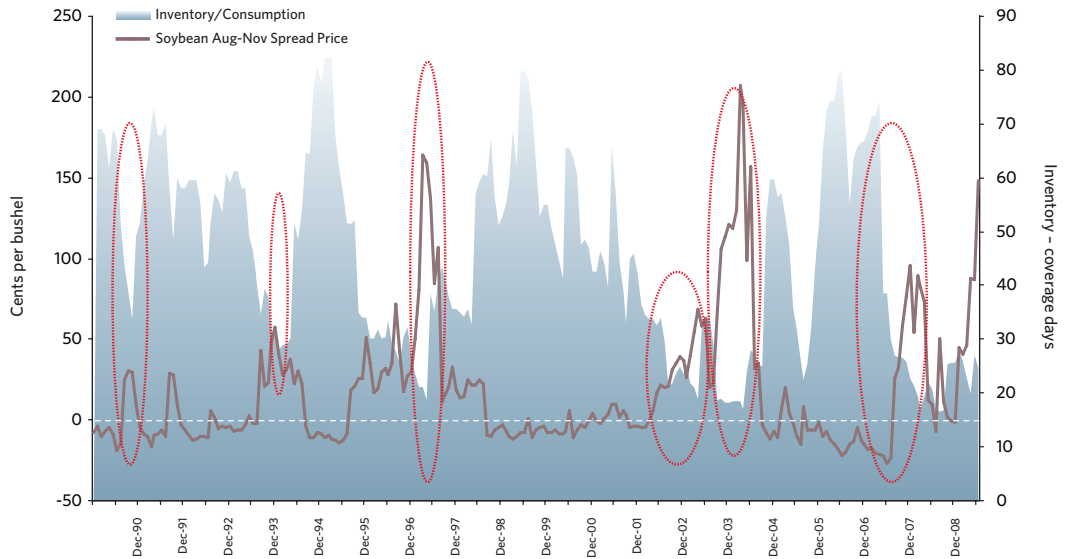
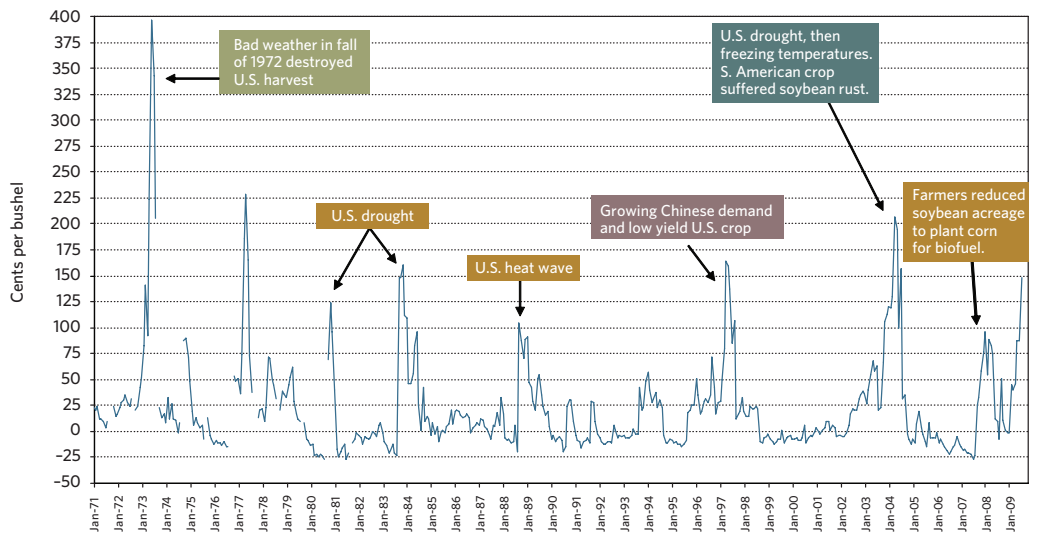
“Old crop — new crop” is an especially popular calendar bull-spread trade, which we will explain in the context of soybeans. Since most of the U.S. soybean crop is harvested during August and September, we can create a typical calendar spread with a long soybean leg expiring in August and the short leg expiring in November.

We can use the soybean old crop — new crop chart to tie together two of the key themes we have discussed in this report (Exhibit 9). First, compare the top half of Exhibit 9 (the value of the soybean old crop — new crop spread) with Exhibit 6, which depicts the price of soybeans. It is apparent that the pattern is the same as Exhibit 6 but the volatility is much reduced — a benefit possible through active management, but outside the scope of a simple passive position in soybeans.

Exhibit 9

The “old crop - new crop” soybean calendar spread provides a way to get exposure to inventory shortages while being (partly) hedged against longer-term soybean spot price moves. The upper chart shows the same pattern as unhedged soybeans in Exhibit 6, but with less volatility. Circled periods in the lower chart show how events that lead to price spikes are correlated with inventory shortages.

Price of Soybean Aug-Nov Calendar Spread



Data Source: Mellon Capital Management calculations using data from Thomson Reuters and Bloomberg.

We believe modern portfolios can benefit from the alpha and beta diversification and inflation hedging that commodities historically have provided.

Furthermore, the bottom of Exhibit 9⁸ shows the value of the inventory shortage indicator. Note how inventory surpluses or shortages tend to lead or coincide with the price changes of the calendar spread (which move in the opposite direction from inventory). The top figure shows that price spikes occur near supply or demand shocks. The impact of “storability” is also nicely illustrated, with the fact that the old crop — new crop spread price has never dipped below minus 25 cents. This is because old crop inventory holders can choose to store rather than sell whenever old crop prices dip below the futures price of new crops, indicating that 25 cents is the implied cost for transforming old soybean crops into new ones. Traders refer to this implied cost (here, 25 cents) as the “full carry” amount for August-November soybeans.

A final designer trade — the 8:4:3 cattle crush — illustrates how far along investors and hedgers have gone to try and capture operating risks. (A crush position is an elaborate spread position involving futures contracts on raw materials and their processed forms and by-products.) The 8:4:3 cattle crush involves constituents from both the agricultural and livestock sectors. Short positions are established in four May contracts on feeder cattle (the calves) and in three July corn contracts (sufficient to feed said feeders), and a long position is taken in eight October live cattle contracts. Much as the 1:2:3 crack spread discussed earlier is a play on the profitability of crude oil refining, the 8:4:3 cattle crush is tied to the profits of fattening feeder cattle for slaughter. Interestingly, this crush also takes into account that “feeders are the leaders.” That is, feeder cattle require six months to mature into live cattle. So, a properly designed cattle crush should use live cattle contracts that deliver at least five months after the feeder cattle contract expires.

Conclusion: Commodities Investing is Enhanced Through Active Management

We believe modern portfolios can benefit from the alpha and beta diversification and inflation hedging that commodities historically have provided. Passive, long-only commodity indices can function as hedges in a typical diversified portfolio, but are not optimal — their track records reveal sharp and prolonged downturns that have produced disappointing Sharpe ratios.

These drawbacks can potentially be mitigated through an active investment approach that is grounded in economics. Active investors can capitalize on three basic, enduring characteristics of commodity markets: the fundamentals-driven nature of prices; length of adjustment periods necessary to correct shortages; and the alpha-neutral motives of merchants to share operating risk with speculators. We believe that commodities offer novel sources of alpha and skill-based risk premium opportunities for investors seeking diversification, inflation hedging and returns.

⁸ The price series is formed by rolling over both the August and September positions to the next-year contracts every August when the front August contract stops trading.



Kenton K. Yee

Kenton K. Yee, Senior Research Analyst in Multi-Asset Research, joined Mellon Capital Management in 2007 after six years on the full-time faculty at Columbia Business School, where he taught advanced MBA electives on securities selection. At Mellon Capital, Ken focuses on developing innovative techniques to manage active commodity

futures portfolios. His current responsibilities build on years of experience in futures markets. From 2004 to 2007, Ken served on the Academic Advisory Board of HedgeStreet Exchange.⁹ From 2000 to 2004, Ken co-authored patents with the founder of HedgeStreet and advised extensively on issues related to futures-market design and regulation. Ken earned a PhD from Stanford Business School, a JD from Stanford Law School, and a PhD in theoretical physics from UCLA after majoring in mathematics at MIT and theoretical physics at Caltech. Ken has over twenty articles published in top academic journals in topics ranging from financial forecasting and asset pricing to elementary particle physics and statistical mechanics.

⁹ HedgeStreet Exchange was the United State's first CFTC-sanctioned Internet futures exchange. In 2007, U.K.-based IG Group Holdings PLC purchased HedgeStreet and renamed it the North American Derivatives Exchange.

The S&P GSCI® is a composite index of commodity sector returns representing an unleveraged, long-only investment in commodity futures that is broadly diversified across the spectrum of commodities. The returns are calculated on a fully collateralized basis with full reinvestment. The S&P GSCI® Energy Index is a component of the full S&P GSCI® Index, representing about 71% of its value as of November 2009. The S&P GSCI® Non-Energy Index is a component of the full S&P GSCI® Index, representing about 29% of its value as of November 2009. The Dow Jones-UBS Commodity Index (DJ-UBSCI) is designed to be broadly representative of the commodities market, comprising 19 commodities that qualify according to liquidity and production criteria. The equal weighted long-only index is a monthly-rebalanced, equal-weighted index consisting of up to 24 exchange-trade commodity futures, compiled by Mellon Capital Management.

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A Sharpe ratio is the annual portfolio return minus the risk free interest rate divided by the standard deviation of the annual return. It is a commonly used measure of portfolio performance.

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Commodities Industry Concentration: The energy, metals, and agriculture industries can be significantly affected by commodity prices, world events, import controls, worldwide competition, government regulations, and economic conditions.

Alpha is a measure of the residual risk that an investor takes for investing in a fund rather than a market index. It represents the difference between a mutual fund's actual performance and the performance that would be expected based on the level of risk taken by the fund's manager. Beta coefficient measures an investment's relative volatility or impact of a per-unit change in the independent variable (market) on the dependent variable (portfolio), holding all else constant.

Past performance is no guarantee of future results.

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