



# MFA Reporter

September 2001

Reporting on issues for investment professionals in futures, hedge funds and other alternative investments

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MANAGED FUNDS ASSOCIATION

Dear Members:

On behalf of all of us in the alternative investment industry, we offer our heartfelt sympathy and condolences to the many families, friends and colleagues around the world who have been harmed and saddened by the recent outrageous terrorist acts.

We thank the dedicated firemen, police officers, medical professionals, rescue workers and volunteers for their unselfish devotion to saving lives. We hope for an end to the suffering caused by these appalling acts in New York, Washington D.C. and Pennsylvania.

Sincerely,  
Managed Funds Association

## MFA in Washington

### The Agenda on Capitol Hill after the Terrorist Attacks

*By Patrick J. McCarty, MFA General Counsel*

The September 11 terrorist attacks, which demolished the World Trade Center and damaged the Pentagon, are having a profound effect on Capitol Hill. The tone is quite different. Gone for the time being is the partisan rhetoric. The Hill – Democrats and Republicans – is pulling together behind the President to come up with a united response. The first step is \$40 billion in emergency aid, which was put together in less than a week, and is already signed into law. The two sides are now talking with each other and the Administration about what to do about terrorism as well as an economic stimulus package. The focus and agenda have changed dramatically, as it should. It appears that true bi-partisanship has a chance of springing from this terrible tragedy.

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# Systematic Strategies in the Commodity Futures Markets

By Hilary Till, Principal, Premia Capital Management, LLC

**Author's note:** This is an updated version of an article, which was originally published in the Fall 2000 Derivatives Quarterly journal

Since the Goldman Sachs Commodity Index (GSCI) was launched in 1992, the arguments for why a basket of long commodity futures contracts should have positive returns have been well chronicled. What has not been very well publicized is that there are additional, unrelated return opportunities in the commodity futures markets, which can be discovered empirically and understood theoretically.

This article will begin by discussing which particular commodity futures contracts one can expect systematic positive returns from a long investment. The article will then discuss return opportunities in other commodity futures markets whereby one shorts systematically overvalued futures contracts. The article will conclude by noting that the lack of correlation among these strategies means that one can potentially set up surprisingly low-risk portfolios of futures strategies.

## Systematic Long Commodity Futures Program

The explanation for there being returns in a long commodity futures program usually starts with Keynes' *A Treatise on Money*. Keynes [1935] wrote that spot commodity prices are so volatile that a producer will sacrifice returns in order to hedge himself against the:

“risk of price fluctuations during his production period. Thus in normal conditions the spot price exceeds the forward price, i.e., there is *backwardation*. In other words, the normal supply price on the spot [market] includes the remuneration for the risk of price fluctuations during the period of production, whilst the forward price excludes this.”

The Keynes hypothesis holds that substantial producer hedging pressure causes the forward price of certain commodity futures contracts to fall to a discount to the spot commodity price. One implication of this hypothesis is that an investor who buys discounted commodity futures contracts may expect to earn a return due to taking on price risk that

inventory holders wish to lay off.

The careful reader of the Keynes hypothesis may wonder whether the suggested return opportunities are limited to commodity futures contracts that normally trade in *backwardation*. To review commodity-specific terminology, a commodity futures curve is in “backwardation” if either the commodity’s spot price is trading at a premium to its futures contracts or if a near-month commodity futures contract is trading at a premium to deferred futures contracts.

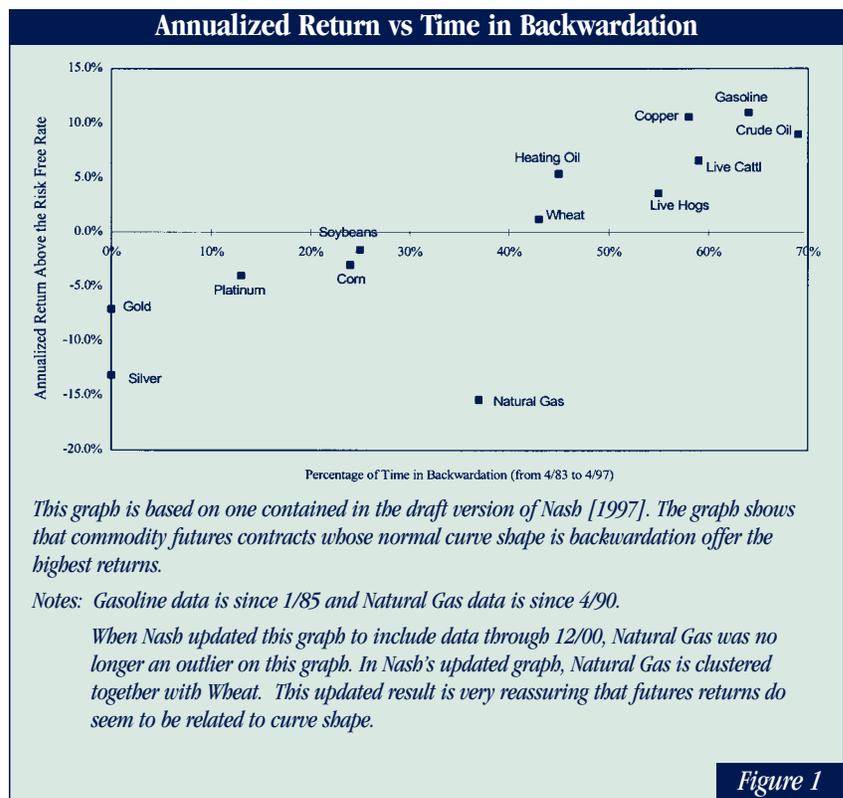


Figure 1

Based on recent historical data, Nash [1997] confirms that positive return opportunities are confined to commodity futures contracts that normally trade in backwardation:

Nash [1997] notes that the chart illustrates a further point:

“The return on a commodity index is proportional to the amount of time the commodity is in backwardation.”

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## Systematic Strategies

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From both Keynes' hypothesis and Nash's empirical study, one would conclude that an investor should confine their long investments to those commodity futures contracts that typically trade in backwardation. These are the contracts for which one is paid to take on volatile price risk. Given the lack of returns in the other contracts, it does not appear that an investor is serving an economic purpose by being systematically long non-backwardated futures contracts.

### **Systematic Short Commodity Futures Program**

We have found that a careful empirical study of commodity futures price patterns can reveal systematic return opportunities among a number of commodity futures contracts that are *not* normally backwardated. Moreover, one earns these returns by systematically shorting these contracts during well-defined times of the year.

In order to discover this class of trades, we had to first have a framework for understanding the economic function of commodity futures markets. Having access to substantial computing power was not enough to make this discovery. Mehta [2000] quotes the co-founder of the Prediction Company, Doyne Farmer, about the difficulties in relying solely on quantitative techniques to discover investment opportunities:

“We started out assuming that simply using sophisticated time-series techniques would give us a clear advantage that would allow to make profits,” Farmer says now. “But we found there were no magic bullets. We had to think harder about how the markets worked and structure our models to make the data to speak to us. The data didn't speak to us automatically.”

In our case, we examined whether weather-sensitive commodity futures contracts exhibit any detectable empirical regularities around key weather events. We found that they did, and that they are systematically overvalued at particular times of the year. This means that an investor has been able to earn statistically significant profits by being short these commodities preceding key weather events for these commodities. The weather-sensitive contracts for which such return opportunities are available include the grains, cotton, coffee, and natural gas futures markets.

In another article (Till [2000]), we called this class of trades, “the weather fear premium” strategy:

“A futures price will sometimes embed a fear premium due to upcoming, meaningful weather events. One cannot

predict the weather, but one can predict how people will systematically respond to upcoming weather uncertainty.

In this class of trades, a futures price is systematically too high, reflecting the uncertainty of an upcoming weather event. We say the price is too high when an analysis of historical data shows that one can make statistically significant profits from being short the commodity futures contract during the relevant time period. And further that the systematic profits from the strategy are sufficiently high that they compensate for the infrequent large losses that occur when the feared, extreme weather event does in fact occur.”

Our hypothesis for why these empirical regularities exist is as follows. Particularly for the grain and natural gas markets, the economy cannot tolerate threats to either the food or energy supply, so the market adds a premium to the futures price around the time of potential weather shocks to ration demand. Further, the commercial commodity trade can be well aware of this return opportunity with no danger of it disappearing. This is because in order to take advantage of these positive expected-value opportunities, they would have to absorb volatile price risk that would impair their ability to carry out essential business planning.

The following will discuss several examples of weather-premium trades.

### **Coffee**

Starting about May, there are fears of a frost in Brazil, which would adversely affect coffee production. A systematic trade is to short coffee futures from late May to late June. The historical likelihood of a frost increases from

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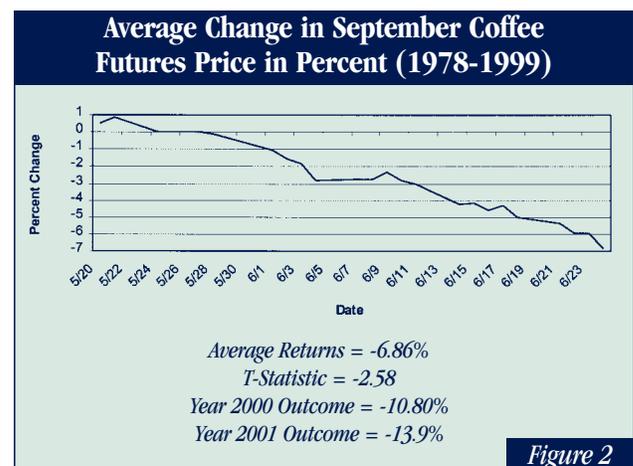


Figure 2



## Systematic Strategies

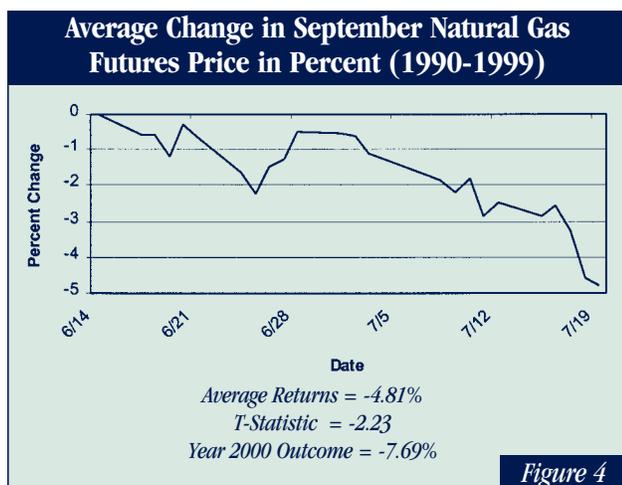
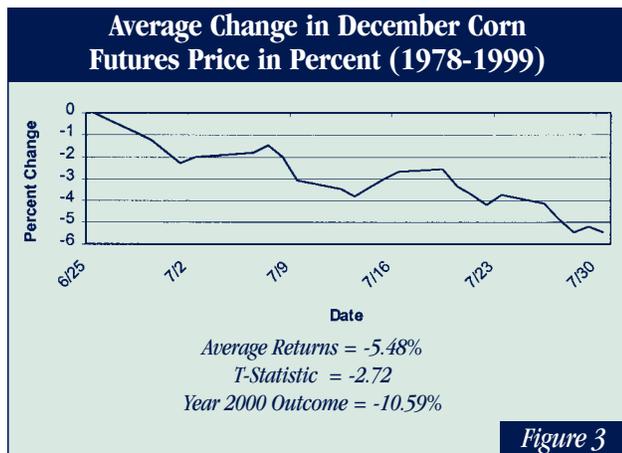
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late June. This trade has been very consistent historically, indicating that its historical profitability is unlikely due to randomness. And in fact, we believe that its consistent profitability is due to the weather fear premium being embedded in the futures contract, which erodes day by day as the feared weather event does not occur.

### Corn

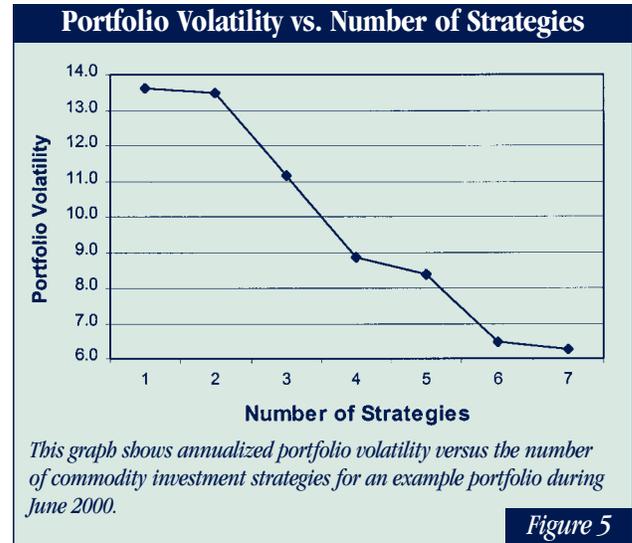
A second example is corn. Its key pollination period is about the middle of July. If there is adverse weather during this time, new-crop corn yields will be adversely affected. This means that the new-crop supply would be substantially lessened, dramatically increasing prices.

A systematic trade is to short corn futures from June through July. Historically there has been too high a premium embedded in corn futures contracts during the pre-pollination time period.



### Natural Gas

A third example is natural gas. In July, there is fear of adverse hot weather in the U.S. Northeast and Midwest. Air conditioning demand can skyrocket then. From June to mid-July, a systematic trade is to short natural gas futures contracts at the height of a potential weather scare.



### Portfolio of Unrelated Commodity Strategies

An investor can potentially take advantage of these opportunities because of the portfolio effect of combining many unrelated risks. Conversely, an undiversified, commercial commodity entity that is solely exposed to the riskiness of an individual commodity market probably cannot take full advantage of this type of trade.

A recent commodity portfolio from June 2000, which combined long, hedge-pressure trades with short, weather-fear-premium trades, illustrates the effect of incrementally adding these unrelated trades on portfolio volatility:

### Conclusion

As in all strategies that exploit structural phenomena, one can certainly choose to passively invest in the weather-premium strategy, expecting to earn a positive return over time. Alternatively, one can also create quantitative models, incorporating fundamental and technical data, so that one can judge if weather-sensitive futures contracts are especially over-valued, if at all, in a particular year. One would certainly do this in an actively managed commodity futures program.

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## Systematic Strategies

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We also note that there are other active decisions for pursuing the type of strategies mentioned here. A manager must decide how much to leverage the strategy, how many reserves to set aside in the event of a catastrophic event, and whether to give up any returns by hedging out some of the strategy's extreme risks.

We conclude by noting that we believe that there are undoubtedly other systematic return opportunities in the commodity futures markets, waiting to be identified, classified, and, of course, monetized. The contribution of this article is to identify one additional source of systematic return besides what has been well documented by proponents of systematic investments in long commodity futures contracts.

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## Impetus Behind Huge Hedge Fund Growth

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The objective of the Japanese investor is generally to have assets noncorrelated to the Japanese market where institutions have considerable exposure. Many of the Japanese institutions view alternative investments as a fixed income substitute. The institutions are looking for a low-risk, low-volatility product that has a simple strategy and is transparent.

Many of the Japanese institutions are taking a fund of funds route due to time zone differences, complexity of information required and difficulty in running such a program from Japan. It is estimated 85% of the business is done through fund of funds.

Sumitomo Life is the most active insurance company in hedge funds. It is estimated the current allocation is about \$2.5 billion to \$3.0 billion. Sumitomo Life has allocated about \$100 million each to 25 gatekeepers i.e. U.S. and European fund of funds which in turn allocate to hedge funds. In total, it is estimated about 300 hedge funds have received allocations from Sumitomo Life.

Other life insurance companies allocating to hedge funds are Daido Life Insurance Company, Tokio Marine & Fire Insurance Co, and Nippon Life Insurance.

The newest institutional investors to be interested in hedge funds are Japanese regional banks who have been less affect-

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