

## Gold And Crude Oil Are Unrelated

*“A woman without a man is like a fish without a bicycle.” – Gloria Steinem*

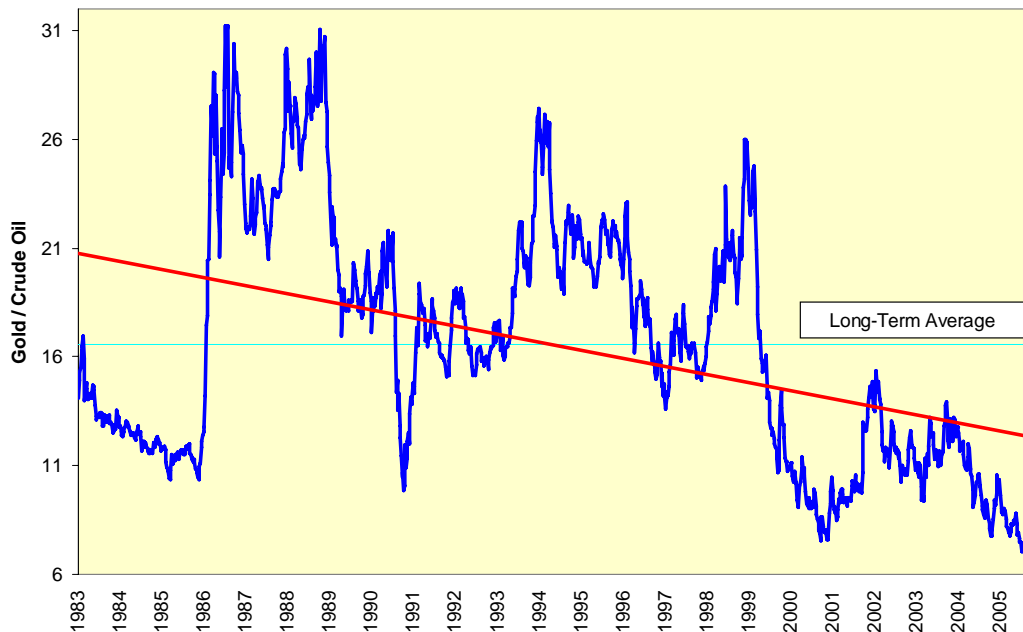
Neophyte futures traders in the 1970s were told to trade silver off of soybeans, or vice-versa depending on who was doing the mentoring. Both were seen as representatives of the inflationary scourge then upon the land. You certainly would not hear that today, and the paths of the two commodities separated long ago and for good reason: They are completely unrelated.

The subject of the relationship between crude oil and gold arose during a [Columnist Conversation](#) last Friday. I offered a group of reasons for why crude oil and gold should be treated separately. One of the most powerful reasons, surely of interest to market technicians, is the long-term ratio of the spread: Its very history provides the best reasons to ignore it.

### Spread Characteristics

The chart below depicts the ratio of the weekly average of cash gold expressed in dollars per ounce to the weekly average of cash West Texas Intermediate crude oil expressed in dollars per barrel. The history chart begins with the advent of crude oil futures in 1983; this assures us the underlying prices are the result of market-based decisions. Cash prices are used instead of futures prices to avoid the problems associated with rolling contracts and with the convergence between cash and futures. Weekly averages are used to sidestep the anomalies associated with a single price point.

**The Modern Oil-Gold Relationship**



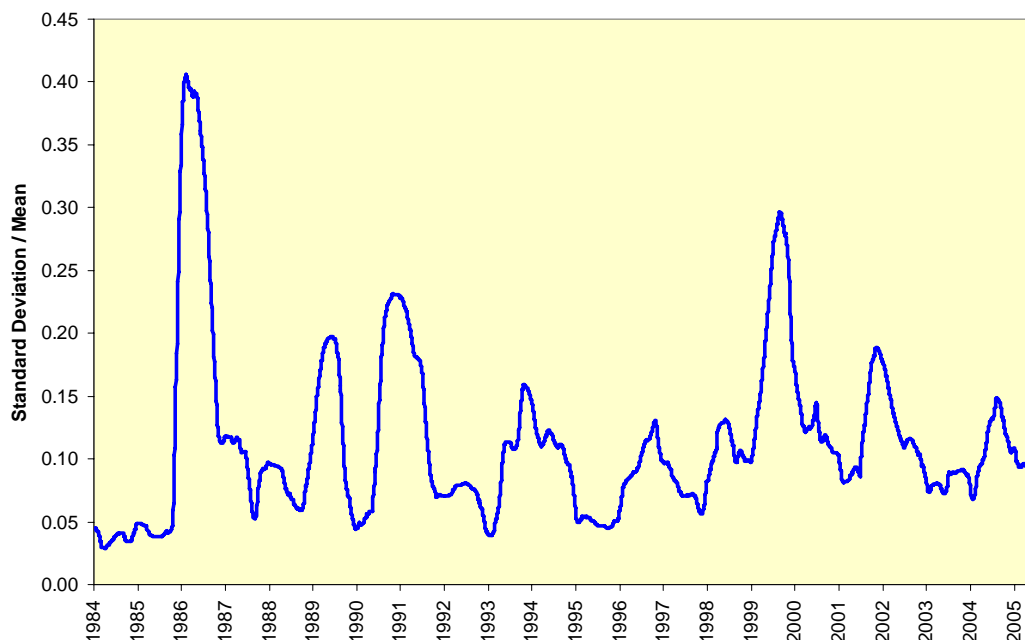
First, let's stipulate the obvious: The ratio clearly is at the low point in its history. But does this argue for a mean-reverting trading strategy, one in which you buy low and sell high hoping for a regression to the long-term average, here 16.56? No: Mean-reversion implies a normal state, one defined by an underlying economic relationship such as substitution. Without such an “attractor” or natural state of affairs operating, we should expect to see a spread with strong and persistent trends defined by the price action of the more volatile asset.

This appears to be the case. The long-term trend of this relationship, marked with a trendline, clearly is lower. This confirms the presence of an underlying economic process, in this case a long-term bull market in crude oil, a resource which is consumed and depleted. Indeed, the only interruptions in the long-term trend, such as those in 1986, 1993 and 1998, are produced by price declines in crude oil, not price increases in gold.

Two other components argue against a mean-reverting process here. The first is the requirement for stable variance over time in the spread's history. Briefly, unstable variance indicates either a non-relationship between the two

assets or a different response by the two assets in question to external economic factors. We will see evidence of the latter below. The next chart depicts a rolling one-year standard deviation of the gold/crude oil ratio divided by its one-year mean using daily cash market data. The rolling one-year timeframe was selected to obscure any seasonal effects. The ratio hardly appears stable over time.

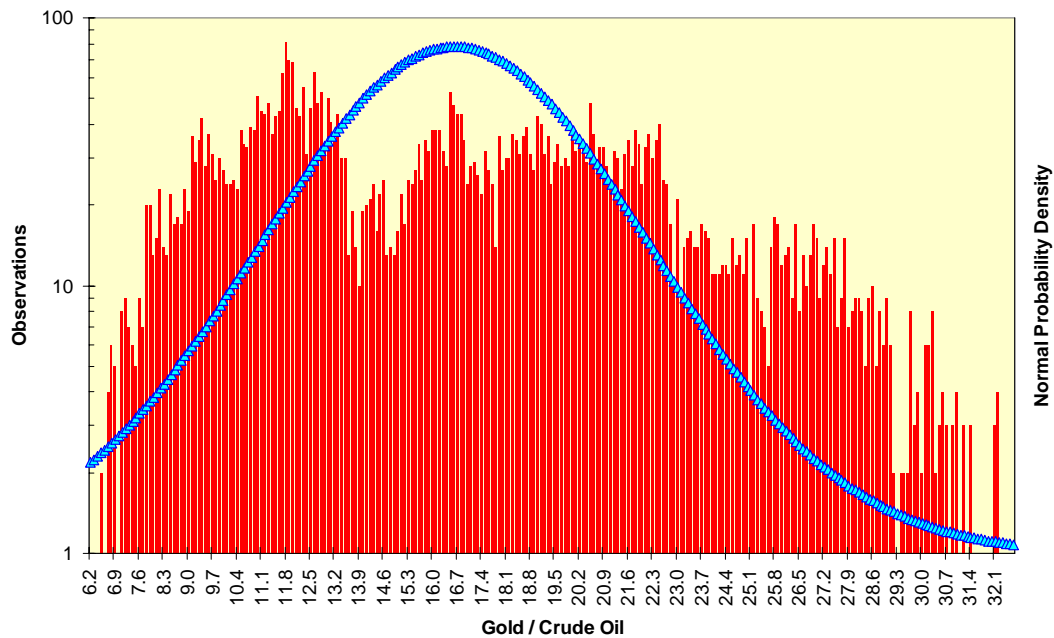
**One-Year Rolling Normalized Standard Deviation Of Gold/Oil Ratio**



### Spread Distribution

A second and more esoteric argument is the distribution of the spread's values. A series unconstrained by an economic relationship should not be distributed normally under a familiar bell-curve or have the "fat tails" observed in most financial time series, but rather in a flattened, or "[platykurtotic](#)" curve. In addition, it should be skewed toward values defined by its more volatile component, in this case crude oil. This distribution is visible in the chart below; the present gold/crude oil ratio is on the extreme left of the chart. The bell-curve overlaid on the actual number of distributions is what we should expect if the series was in fact distributed normally.

Daily Distribution Of Gold/Crude Oil Ratio, 1983 - 2005



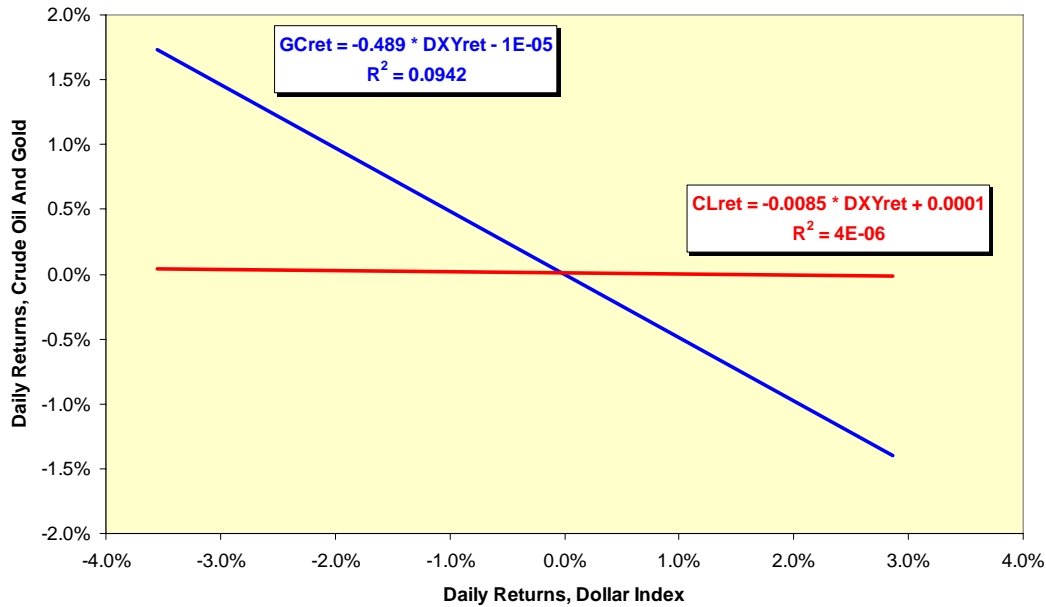
### Common Response To Factors

Gold, as was noted here in [May 2003](#), generally can be modeled well using only two variables, the relationship between expected inflation and expected short-term interest rates and the strength of the dollar. If [inflationary expectations](#) rise, as they have been doing in the aftermath of Hurricane Katrina, gold prices should rise unless short-term interest rates rise faster. And, all else held equal, a weaker dollar should mean the price of gold will rise in dollar terms.

Modeling the price of crude oil is far more complex; it would be correct to say that everyone who has undertaken the endeavor has either been wrong or refuses to admit defeat. But if crude oil prices were in fact related to gold as much as some claim, we should expect to see common responses in the crude oil market to changes in the dollar and inflationary expectations as we do in the gold market.

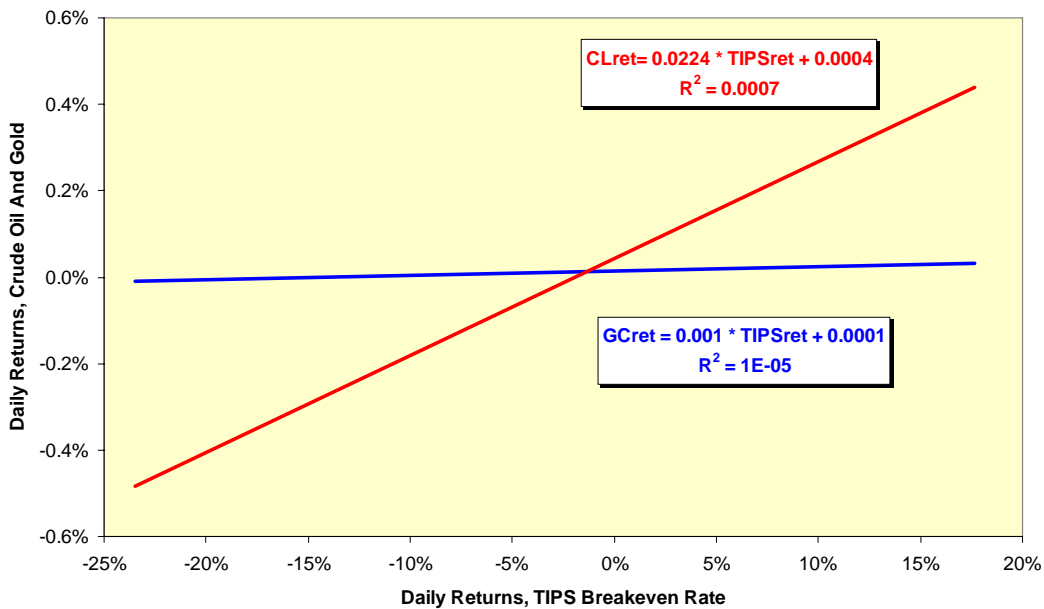
If we take the daily returns for both crude oil and gold going back to 1983 and make them a function of the daily returns on the dollar index, we see the expected response for gold, a strongly negative coefficient of  $-.489$ . The corresponding coefficient for crude oil is statistically indistinguishable from zero, a weakly negative  $-.0085$ . Like Lucy Ricardo, proponents of commonality have some 'splainin' to do.

**Impact Of Dollar On Crude Oil And Gold, 1983 - 2005  
(Only Trendlines Depicted For Clarity)**



What about inflationary expectations as measured by the TIPS market? Here the answer is a little counterintuitive; the returns on crude oil are more strongly related to returns on inflation expectations than are the returns on gold. But the difference is readily explained: TIPS measure changes in the Consumer Price Index, and refined products are part of the CPI. Gold is not part of the CPI. Neither market has a strong dependency on inflation expectations.

**Impact Of Inflation Expectations On Crude Oil And Gold, 1997 - 2005  
(Only Trendlines Depicted For Clarity)**



Will these demonstrable non-relationships change the mental connections between oil and gold? Not a chance; this is an error so powerfully ingrained in the human mind that no set of facts can dislodge it. As Marc Chandler pointed out in the Columnist Conversation thread, a Google search of “oil + gold” produced 23.7 million responses in less than 15 seconds. By way of comparison, a search of “Paris Hilton” produced 12.7 million responses in less than .11 seconds. There’s hope yet.