Sources of Return in the Commodity Futures Markets

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This digest article describes potentially persistent sources of return in the commodity futures markets due to (1) hedge pressure, (2) scarcity, and (3) weather-fear premia. But the article also notes that active commodity futures strategies can be limited in scalability and can potentially lose their potency due to structural breaks or popularization.

Potentially Persistent Sources of Return

The key to understanding why there should be structural returns in the commodity futures markets is to realize that futures markets are not zero-sum games. When one only focuses on the narrow realm of commodity futures markets, it is obvious that for every winner there must be a loser. But this simplifies away the fact that each commodity futures market is embedded within a wider scheme of profits, losses, and risks of its physical commodity market. Commodity futures markets exist to facilitate the transfer of exceptionally expensive inventory risk. Moreover, commodity futures markets allow producers, merchandisers, and marketers the benefit of laying off inventory price risk at their timing and convenience. For this, commercial participants will tolerate paying a (slight) premium so long as this cost does not overwhelm the overall profits of their business enterprise.

Hedge Pressure

One source of structural return is from hedge pressure. In certain commodity futures markets, there tends to be an excess of commercial entities that are short hedgers. Therefore, in order to balance the market, investors must be willing to take up the slack of the long side of these markets. And in order to be persuaded to enter these markets, investors need a return for their risk-bearing.

In some commodity futures markets, producers are in a more vulnerable position than consumers and so will be under more pressure to hedge than consumers. This leads to a "congenital weakness" on the demand side for some commodity futures contracts, which causes these contracts' futures prices to be downwardly biased relative to future spot prices, which in turn leads to generally positive returns for holding the futures contract. Live cattle and gasoline are examples of two commodity futures markets where there appears to have historically been a systematic positive return due to a "congenital weakness" on the demand side for hedging.

For the grain markets, there have historically been seasonal times when commercial hedging tends to be long rather than short. Therefore, one might expect that in order to capture the gains from being on the other side of commercial hedge pressure, there are times when an investor's positioning needs to be from the short side rather than from the long side. In other words, when commercial hedgers are net long, we would expect that the corresponding futures price would have a tendency to be biased upwards, leading to systematic profits for an investor taking a short position in the contract. Conversely, when commercial hedgers are net short, we would expect the corresponding futures price would have a

tendency to be biased downwards, leading to systematic profits for an investor taking a long position in the contract.

Scarcity

Another source of return in the commodity futures markets results from buying commodities when they are scarce. This sounds as simple as saying that a source of return in the stock market results from buying equities when they are cheap. The complications arise when one needs to define the technical indicator for when commodities are scarce or when equities are cheap. In the case of commodities, one either directly examines the commodity's supply/usage situation or indirectly examines its futures curve to determine whether a commodity is scarce or not. In the latter case, if the near-month futures contract price is trading at a premium to deferred-month contracts, one has a reliable indicator of scarcity: market participants are willing to pay a premium for the immediately deliverable commodity futures contract.

Weather Premia

Another source of systematic returns in the futures markets is due to "weather premia." A futures price will sometimes embed a fear premium due to upcoming, meaningful weather events that can dramatically impact the supply or demand of a commodity. 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.

One example is from the coffee futures market. The uncertainty of weather in Brazil appears to have historically created a built-in weather premium in coffee futures prices during certain times of the year because of Brazil's susceptibility to frosts and droughts.

Scalability

The main limitation of active commodity strategies is admittedly scalability, which arises from two sources. First, one can argue that all strategies, which exploit inefficiencies, are by definition capacity-constrained. If funds are exploiting inefficiencies, this means that other investors are supplying those inefficiencies. And unfortunately, we can't all profit from exploiting inefficiencies since in that case, nobody would be supplying inefficiencies. A second factor that limits the size of active commodity strategies is unique to the futures markets. Unlike investors in the securities markets, traders of futures contracts in certain markets may not exceed the speculative position limits (spec limits) set for those markets.

Sustainability of Risk-Premia Strategies

One concern in identifying obscure strategies to monetize risk premia is that by their very identification, one will popularize these strategies to a sufficient degree that future returns may be dampened or even eliminated. For example, Siegel (2003) pointed out that "high-beta stocks beat low-beta stocks until William Sharpe discovered beta in 1964; [and] small stocks beat large ones until Banz and Reinganum discovered the size effect in 1979." Furthermore, Rosenberg *et al.* (1985) described how one could have earned abnormal returns in the stock market by buying stocks with a high ratio of book value to market price and selling stocks with a low book/price ratio. The authors' study was over the horizon, January 1973 through September 1984. The authors said, "we felt that the book/price ratio was an intriguing candidate for study. Since it had not been heavily described in the quantitative literature, it might possibly serve as an as-yet unspoiled instrument." Fourteen years later, Cochrane (1999) wrote that "the size and book/market premia [in the equity markets] seem to have diminished substantially in recent years. If this is permanent, it suggests that these opportunities were simply overlooked."

One can also point to other market "inefficiencies" that have been published and yet continue to exist. For example, Hicks (1939) developed the widely known "liquidity premium" hypothesis for bonds. In this hypothesis, Hicks notes that all things being equal, a lender would rather lend in short maturities since they are less volatile than longer-term-maturity bonds. On the other hand, an entrepreneur would rather borrow in a long maturity in order to fix his costs and better plan for the future. In order to induce borrowers to lend long, they must be offered a "liquidity premium" to do so. The result is that bond yield curves have tended to be upwardly sloping.

Like the hedging pressure hypothesis for certain commodity futures contracts, the central idea behind the "liquidity premium" hypothesis is that commercial entities are willing to pay premiums from the profits of their ongoing businesses in order to hedge away key volatile price risks. Hicks' identification of there being a liquidity premium in long-maturity bonds has not prevented the U.S. yield curve from continuing to usually be steep nor has it prevented both mutual funds and hedge funds from designing trading strategies that have historically monetized this premium.

Regarding weather-fear premia strategies, these risk premia could obviously be reduced if improvements in forecasting reduced weather uncertainty. It does not appear though that weather forecasting has improved sufficiently just yet to reduce the uncertainty surrounding key weather times. While weather uncertainty should remain a fundamental factor in commodity trading, there is another way that these strategies can become obsolete. For decades the United States had been the dominant soybean producer. It is now the case that Latin American countries produce a majority of the world's soybeans, which means that trading strategies, which focus on U.S. weather, no longer have the potency they once had in the past. Also, to the extent that Vietnam becomes a more significant coffee producer, one may see coffee futures strategies that are timed around Brazilian weather events lose their potency as well.

Conclusion

While a number of superior trading strategies have historically been quite fleeting, especially once they are popularized, one should add the following about the commodity strategies discussed in this digest article: they have all continued to exist, but sometimes, in addition, require careful timing and sophisticated trade constructions.

Endnotes

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