Research from Yale on Commodities
November 19, 2013
by Robert Huebscher

Many would consider the practice of placing assets in a commodity fund to be speculation rather than investing. That perception was amplified by a recent Bloomberg article, which reported the dismal performance of many managed-futures funds and commodity-trading advisors (CTAs). Contrary to that image, Geert Rouwenhorst, a Yale University professor, claims he has found a way to construct a commodity-based fund that earns a significant premium over inflation.

Indeed, Rouwenhorst says his research supports a return "somewhere in the 7% range."

Rouwenhorst spoke at the 2013 Schwab Impact conference held in Washington, D.C. In addition to his position at Yale, he is also a partner at SummerHaven Investment Management, a Connecticut-based commodities-futures manager.

Rouwenhorst's approach rests on two findings, which he claimed are supported by extensive historical data: "Non-renewable" commodities perform better than renewable ones, and scarcer commodities –those that trade in backwardation – perform better than more plentiful ones.

Rouwenhorst did not provide a copy of the slides from his presentation, because he said it was still in the process of publication.

I'll review Rouwenhorst's research and the basis for the return projections for his fund. I'll also present my counterargument and why I remain un-persuaded that his approach is anything other than the latest incarnation of commodity speculation.

Two centuries of commodity returns

Rouwenhorst's research has sought to answer three questions: How well do commodities keep up with inflation in the long run? How well do commodities track inflation from year to year? How does one think about the expected return for commodities?

With regard to the first question, Rouwenhorst looked at studies showing that commodities have not keep pace with inflation since the Civil War. This would seemingly make them undesirable as investments, but Rouwenhorst argued that these results will not be repeated in the future, at least with respect to agricultural commodities, since we have become much more efficient at growing crops.

Rouwenhorst was not satisfied with the data in those studies, so he collected his own and constructed an index of more than 100 commodities going back to approximately 1800. He adjusted for the mix of commodities over time, since items like plaster of Paris were once more commonly used than they are today.

He found that his index beat inflation when the data were annually rebalanced and when it was kept at fixed percentages. He also noted that during most of its history, the U.S. has experienced deflation or very low inflation. It was not until the creation of the Federal Reserve Bank in 1913 that we experienced moderate or high inflation.

Roughly half of the commodities in his sample beat inflation. Most of those were what Rouwenhorst called "non-renewable" metals and natural resources. Renewable agricultural commodities did not beat inflation.

Rouwenhorst cited academic research that explained why this occurred. That research claimed that one would not extract non-renewable resources too fast, because the oversupply would depress prices. The optimal strategy would be to extract it slowly over time, keeping prices high enough to keep extraction profitable. That rate includes inflation and a real rate of return.

Rouwenhorst then turned to the second question — how well do commodities track inflation from year to year? he showed a scatter diagram that measured the annual return on commodities against inflation. A regression on this data, he claimed, showed that commodities had a "beta" against inflation of 1.27 plus a constant of 0.02. The constant represented the real

rate of return for commodities. He stated that the average correlation for individual commodities against inflation was 32% and that this correlation held in periods of high and low inflation.

Stocks and bonds, he said, had "essentially zero" correlation with inflation on a yearly basis. "Stocks are pretty poor inflation hedges," he said. His explanation was that, in inflationary periods, companies "don't run on all six cylinders" and underperform on a cyclical basis.

Even when looking at the data since World War I, rather than at the full 200 years, Rouwenhorst found the same patterns.

Turning to the third question — how does one think about the expected return for commodities? — Rouwenhorst showed how he would construct a forward-looking estimate for commodity returns. To do this, he looked at the sources of return for a typical commodities-futures index, such as the GSCI or the Dow Jones UBS index. Those returns consist of a collateral component, a roll component and a spot component.

In this respect, Rouwenhorst said he was not trying to make monthly or even annual predictions, but rather a "longer-term forecast." He said that investors could expect the collateral component to resemble the return on U.S. Treasury bonds, roughly equal to the current level of interest rates. The roll component was based on conditions in the futures market. He said that commodities in "backwardation," meaning that the spot price exceeds the prices of future-dated contracts, indicate scarcity of the commodity (a lack of supply today relative to the future). In those cases, the roll return would be positive. He went on to claim that the spot component should roughly equal the rate of growth of real GDP, since those two variables have been highly correlated over time.

Over a 10-year horizon, he assumed a collateral return of 2.75% (based on 10-year Treasury yields), a roll component of -15 basis points and a spot return of 5.1% (consisting of 2.5% inflation and 2.6% real growth). Combine those, and you get a forecasted return of roughly 7%.

A counterargument

Rouwenhorst's presentation was not persuasive.

At this year's Schwab conference, each presenter was asked to provide a five-word summary of his or her presentation. Since I don't have Rouwenhorst's slides, I don't know exactly what his was, but my paraphrasing would be, "When unsure, get more data."

That smacks of data mining. In fact, Rouwenhorst's presentation could be seen as a grand exercise in mining historical data to obtain results that further his investment thesis.

Moreover, his thesis was not internally consistent. He claimed that stocks and bonds have a zero correlation to inflation on an annual basis and commodities provide a better year-by-year hedge against inflation than those asset classes. But his forecast was based on a 10-year horizon, and it is well-known that stocks and bonds both outpace inflation over this time horizon – both on a theoretical and an empirical basis.

Advisors are less concerned with how an asset class performs against inflation on a yearly basis than on a longer-term basis. Treasury inflation-protected securities provide a risk-free return in excess of inflation; today, that real return is approximately 0.5% over a 10-year horizon. That comes with annual volatility, of course.

But Rouwenhorst's forecast implies that investors can earn a 4% "alpha" over that risk-free rate (Rouwenhorst's 7% forecast less 2.5% inflation and 0.5% TIPS return).

Futures markets are incredibly efficient. The commodities markets are filled with traders looking to profit off the transactions of helpless indices, which must rebalance continually. Those traders know which commodities an index will need to buy and sell at any time. That alone presents an enormous challenge to any commodity fund.

In 2010, James Montier of GMO provided an alternative and more sobering view of the expected return from commodities. Montier used the same framework that Rouwenhorst used in decomposing commodity returns into three components. Unlike Rouwenhorst, he asserted that backwardation was related to the level of speculation in the commodities market. He presented data showing that the number of commodities in contango (the opposite of backwardation) has increased along with the growing presence of speculators in the commodities market.

Half the commodities market, according to Montier, is made by those without any interest in the underlying good. Because of this, he estimated that returns in the future would be half of those in the past.

Data mining is blind to those changes in the characteristics of underlying markets. Advisors do not need to be this blind.