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Drilling Down Commodities

Investors have historically used commodities for its diversification and inflation protection benefits. The concept of commodities as an asset class, however, is not widely understood. Unfortunately, there is no single acceptable definition of an asset class or of commodities as an asset class. However, the way one chooses to define asset class is an essential part of asset allocation.

DEFINING AN ASSET CLASS

Two generally accepted asset allocation frameworks are defined by either cash flows or market factors.[1]

The first asset allocation framework is defined by cash flows and comprises three overarching asset classes:

- Capital assets, such as stocks, bonds and real estate, are designed to provide an ongoing source of value that can be measured using the present value of future cash flows technique.
- Consumable or transformable assets, like commodities, only provide a single cash flow.
- Stores of value assets, such as currency and fine art, do not generate income and are not consumed in the literal sense, but they do have monetary value.

Coupled with the fact that commodities are the basic ingredients that build society, commodities are a unique asset class and should be treated as such.

COMMODITIES AS AN ASSET CLASS

Commodities offer an inherent or natural return that is not conditional on skill. Commodities form a unique asset class, as it consists of the basic ingredients that society uses.

What is the passive return of commodities as an asset class that is not skill-based? This is an important question, especially since at first glance it may be difficult to envision noncorrelated commodities like oil, coffee, cattle and gold as constituents of the same asset class. The first link between them is that they are natural resources. The second connection is that each commodity has the same five return components when accessed by an index program that does the following:

- Constructs and calculates with a passive, specified method;
- Considers only exchange-traded futures contracts on physical commodities;
- Assumes only long positions; and
- Collateralizes each position fully.

UNDERSTANDING PASSIVE RETURNS IN COMMODITIES

Passive returns require specified rules that allow general asset class exposure. For example, the S&P GSCI is a broad basket of exchange-traded futures contracts on physical commodities that is world-production weighted, so it is considered the beta (or market exposure) of commodities as an asset class. The world production weighted metric is the closest representation to what the world of commodities looks like. Simply put, in U.S. dollar terms, there is more production of oil than corn. Other indices, like the Dow Jones Commodity Index (DJCI), allow access to commodity returns in different proportions.

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Perhaps the most important characteristic of accessing returns of commodities as an asset class is the requirement of using futures contracts. Physical commodities may be accessed through the cash market, but storage is costly and difficult. Further, some investors may consider obtaining commodity returns from equities, public or private, but this approach results in imperfect exposure.

Companies may make decisions that are in the best interest of the shareholders, but they may not be related to the underlying commodity. In fact, the company may choose to hedge out their commodity exposure in order to limit the volatility of earnings. That said, there is generally some correlation between equities of commodity producers and the underlying commodities; this varies depending on the time frame and type of commodity. Based on monthly index data since 2006, the correlation has been highest for oil and gas, at approximately 0.67, and lowest for agribusiness, at 0.38.[2] Since these correlations are not very high, equities do not give the most direct exposure to commodities. Instead, they may be best used where only equities are allowed or where there is not a highly developed futures market, such as in water, coal, timber or steel.

Exchange-traded futures contracts on physical commodities are not only the most practical and direct (0.99 correlation to the spot market) way of gaining commodities exposure, but they are necessary to access the five components of the returns of the asset class. Futures contract pricing is a direct function of spot prices by the Theory of Storage Equation.[3] This equation shows that the futures price reflects the expected future spot price, expressed in terms of the current spot price plus the cost of storage. Only from the use of futures contracts can an investor have the possibility

of accessing fundamental sources available through the relationships between producers and consumers over time.

A futures contract is a standardized agreement between two parties in which the buyer agrees to buy and the seller agrees to deliver (sell) the underlying asset at a specified price on a set future date or expiration date. Most positions are closed before expiration to avoid delivery. The futures contracts included in indices are exchange traded and regulated.

The commodity futures market exists in an effort to provide a place for commercial producers and consumers to insure their operations from the impact of price volatility on earnings. Producers sell short futures contracts to attempt to offset the risk of falling commodity prices, and the consumers (sometimes called processors) buy long futures to try and offset the potential risk of rising commodity prices.

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Since the consumer does not usually have as much of a need to hedge as the producer, there tends to be an excess of commercial entities who are short hedgers across a number of commodity futures markets. This can be supported by two economic theories; the first is Keynes' theory of normal backwardation, which claims that producers sell their production forward at a discount to expected future spot prices in order to protect against potential price drops. The other is Hicks' theory of congenital weakness, which claims that it is easier for consumers to choose alternatives, meaning they could be less vulnerable to price increases than producers may be to price drops.

For example, a food ingredient label might list a product is made from either soybean oil, palm oil or canola oil, but the reality is that the food contains the cheapest of these oils. This is done so that the processors of the food do not need to change the label every time they use different ingredients. However, it might be more challenging for an agricultural producer to switch canola bushes for palm trees. This imbalance of more producers on the short side and fewer consumers on the long side creates a gap on the long side of the commodity futures market where investors could potentially earn an insurance risk premium.[4]

The 5 Components of Returns

The insurance risk premium is the first and main component for long-term returns in commodity indices when attempting to represent the asset class. However, there are a few others that play a role. The second is collateralization. Because one must put down collateral in order to buy commodity futures, the collateral earns interest from the Treasury bill rate in which it is invested. This could provide the expected rate of inflation plus a real rate of return, but only if the index is fully collateralized; meaning for every one dollar of exposure, there is one dollar in the margin account. Both the S&P GSCI and DJCI are fully collateralized.

The third component is the convenience yield that is earned when there is low inventory compared with demand. Convenience yield is positive in indices that hold the nearest, most-liquid contracts, specifically when the price of commodities increases from a shortage, which provides a possible premium for the convenience of having the commodity at that time. For example, a refiner may be willing to pay a higher price for oil, since gas production will stop without oil—in other words, it is convenient for the refiner to have oil.

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The fourth component is expectational variance, which is caused by generally unexpected inflation (or "supply-side shocks") that may cause a spike in commodity prices completely unrelated to capital markets. Examples of this include a pipeline burst or drought. Expectational variance is positive more often than it is negative; however, one example of negative expectational variance would be from a demand shock created by mad cow disease in the cattle industry. The importance of expectational variance, other than that it can provide a source of inflation protection, is that it drives the pattern of commodity returns to vary by individual commodities. It also causes different return patterns from that of stocks or bonds, which improves diversification benefits.

The fifth component is rebalancing. Commodity indices may experience a return based on the frequency of the rebalance—essentially selling what goes up and buying what goes down. This is not unique to commodities, but it is still a component of returns.

The most unique components of returns for commodities as an asset class is that they serve to potentially diversify and protect from inflation. For more information on diversification and inflation protection, please see our Practice Essentials piece entitled "Weighing In on the DJCI and S&P GSCI" and visit our "Index Matters" video series and blog at www.indexologyblog.com.

NOTES

1. Source: Ibbotson Associates 2006, Strategic Asset Allocation and Commodities, Commissioned by PIMCO and Prepared by Thomas M. Idzorek. http://corporate.morningstar.com/ib/documents/MethodologyDocuments/IBBAssociates/Commodities.pdf.

2. Uses Historical daily data from 1/2006-5/2013 of S&P Commodity Producers Gold Index TR, S&P GSCI Gold Index Total Return, S&P Commodity Producers Oil & Gas Exploration & Production Index TR, S&P GSCI Energy Index Total Return, S&P Commodity Producers Agribusiness Index TR, S&P GSCI Agriculture Index Total Return sourced from S&P Dow Jones Indices.

3. Source: Working, H. 1933, "Price Relations between July and September Wheat Futures at Chicago Since 1885," Wheat Studies of the Food Research Institute.

   Theory of Storage Equation

   $F_{0,T} = S_0 \exp[(r+c-y)T]$

   where

   $F_{0,T}$ = the futures price today for delivery at time T;

   S_0 = the spot price today;

   r = the riskless interest rate, expressed in continuous time;

   c = the cost of physical storage per unit time, expressed in continuous time;

   y = the convenience yield, expressed in continuous time.

4. Source: Till, H. and Gunzberg, J., 2006, “Absolute Returns in Commodity (Natural Resource) Futures Investments,” Chapter 3 in I. Nelken (ed), *Hedge Fund & Investment Management*.

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