



REVISITING AN EXPOSURE TO COMMODITIES

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EXECUTIVE SUMMARY

We invest in commodities to improve the risk adjusted returns in our portfolios. To gain this exposure we invest in futures contracts rather than the physical commodity. In recent years (excluding 2016 to date) returns in commodities have lowered overall portfolio returns. A new paper discusses the possible reason why returns have disappointed: the fact that commodities are now generally in contango (the futures price is greater than the current price) instead of backwardation (the futures price is less than the current price), and explores the implications for future commodities investors.

We found the returns on commodities when they are, as a whole, in contango or backwardation to be statistically the same. In other words, investors cannot simply use contango or backwardation of the commodities market as a signal to invest or divest.

OVERVIEW / OBJECTIVE

We devote a portion of our growth assets to commodities based on our own internal research, as well as research performed by external firms, demonstrating the improvement to risk adjusted returns due to the inclusion. However, because of the volatility of the asset class, it is often a source of frustration.

Historically, commodities have had little correlation to traditional asset classes. As a result, a small exposure to commodities has reduced overall portfolio risk even though commodities, as an asset class, are very volatile.

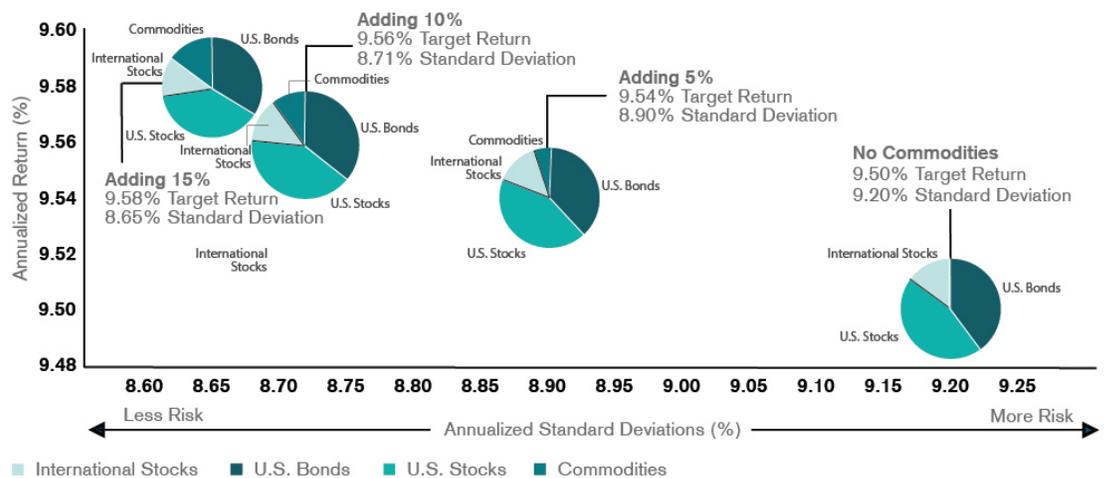


¹ *Washington Trust Bank Wealth Management & Advisory Services*

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Adding Commodities for a More Complete Portfolio (01/01/1970 - 12/31/2014)



Sources: Credit Suisse Asset Management, Ibbotson, Bloomberg. Risk measured by standard deviation, a statistical measurement of dispersion around an average which depicts how widely returns varied over a certain time period. Allocation: Initial allocation: 40% U.S. bonds, 45% U.S. stocks, 15% international stocks. As commodities were added, other asset classes were reduced proportionately. Commodities measured by: S&P Goldman Sachs Commodities Index. U.S. Stocks: S&P 500 TR Index. International Stocks: MSCI Daily TR Net EAFE Index. U.S. Bonds: Represented by the Ibbotson Intermediate-Term Government Bond Index TR from 1/1/1970 to 12/31/2010, and BofA Merrill Lynch U.S. Treasury Current 5 Year Index from 12/31/2010 through the end of the period. Historical performance indications and financial market scenarios are not reliable indicators of future performance.

Another benefit is the inflation hedge commodities can provide. A Yale University study looked at commodity prices from 1914–2011 and found commodities have an average positive correlation to inflation of .59. During this same period, stocks had a negative correlation of .04 and bonds had a negative correlation of .17. Gold, which is generally considered a good inflation hedge, had a correlation of only .25, highlighting its lack of hedging capability when compared to a basket of commodities. In addition, during periods of unexpected inflation, commodities have historically outperformed stocks and bonds.

Finally, commodities can reduce risk brought about by geopolitical shocks. Geopolitical shocks generally have a negative effect on risky assets as investors flock to safety. Commodities, on the other hand, can provide a hedge. For example, unexpected conflicts in the Middle East generally cause stocks to decline, but those travails usually bolster precious metal and oil prices.

For these reasons we devote a portion of our assets to commodities. We do not make active bets on which commodity will outperform, but rather hold a basket of commodities. Due to storage and transaction costs, we do not invest in or hold any physical commodities, but gain exposure via futures contracts covering commodities. A futures contract is an agreement to buy the physical commodity at a stated price at a specified future date. For us, the commodity is not actually purchased, but the contract is rolled to the next period before expiration. As a result, the return is based on more than the simple movement of the commodity. It can be broken down into three components: changes in the price of the commodity, the roll yield, and the return on the collateral securing the futures contract.



The current price, or spot price, of the commodity is dictated by supply and demand and varies over time. Since futures contracts are purchased on margin, the collateral backing the purchase can also be invested, and to reduce risk the collateral is invested in Treasuries. Subsequently collateral returns are determined by interest rates. Since those rates have declined, so too has this part of the return.

The remaining component, roll yield, is determined by the difference in the spot price of the commodity and the futures price. In the past, commodity future prices were consistently cheaper than the spot price. This relationship—where the spot price is more than the future price—is called backwardation. Keynes's theory behind this relationship as the standard presumes the idea that speculators, who buy futures contracts, need to be compensated for taking on the risk, and therefore buy when the future price is below the spot price.

In “normal backwardation”, the futures' price will naturally rise to equal the spot price as the futures contract gets closer to expiration. As a result, during periods of backwardation, investors earn a profit by rolling the expiring futures contract into the next futures contract, earning a positive roll yield. However, when speculators outnumber hedgers, or those producing the commodity, the demand for the futures contract causes its price to rise above the spot price.

When the futures' price is above the spot price, the relationship is called contango. Since 2000, commodity prices have been largely in contango. In fact, the commodities market has been in contango over 80% of the time since the turn of the century. One theory behind this change postulates that investors like us are the cause. To broaden diversification, many investors today include commodities in their portfolios. They, like us, buy a fund that invests in a broad basket of commodities via futures contracts instead of the physical commodity. As a result, the demand for futures contracts now outweighs the demand for the commodity itself.

The returns from commodities over the last few years (2016 excluded) have been disappointing and have detracted from overall portfolio performance. Slower global growth, dollar appreciation, stimulative monetary policy, and oversupply have all factored in to the negative returns.

All asset classes go through periods of under performance and out performance. A new paper written by John Gabriel, a Morningstar strategist, suggests that commodity exposure through futures may no longer offer the same diversification benefits, however, since commodity markets are now normally in contango. Because of this, the roll yield will be negative, and low interest rates mean the yield on the collateral will be minimal as well.

Our goal is to determine if there is any merit to his argument. If there is, then our goal would be to create a tactical strategy to improve risk adjusted returns using contango and backwardation as buy and sell signals.

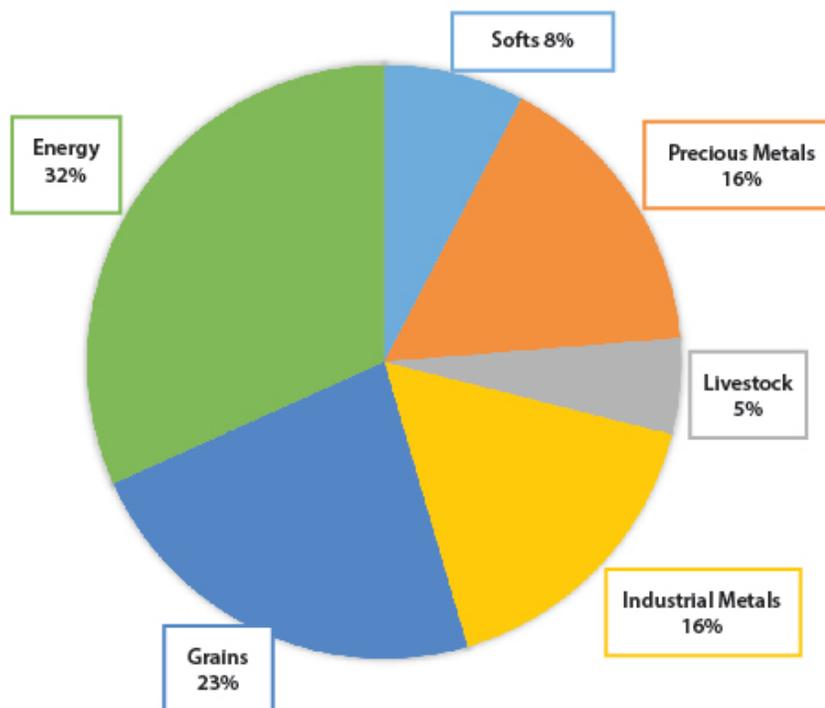


STUDY

As stated earlier, we invest in commodities to broaden diversification and provide the portfolio with a source of noncorrelated returns. The research into the benefits of commodity futures as a portfolio diversifier is extensive. As far back as 1980, Bodie and Rosansky (1980) analyzed commodity futures and stock prices from 1950 to 1976 and found that a 60% stock and 40% futures portfolio provided similar returns to an all stock portfolio, but reduced volatility by a third. Gorton and Rouwenhorst (2006) extol the benefits of investing in commodities futures and discuss the positive risk premium to be consistent with Keynes's theory of "normal backwardation."

Unfortunately, these benefits could be lost if Gabriel (2016) is correct and "normal backwardation" is no longer the normal state. In his paper he cites Vanguard's study of the different sources of return for the S&P Goldman Sachs Commodity Index from 1983 through September 30, 2008. The Vanguard study breaks down the return as follows: total annualized return for the index was 7.1%; of that, 6.4% came from the collateral return, 3.3% from the roll yield, and a -2.6% came from the spot return. Therefore, if the return from the roll yield continues to be negative as it is currently, and the return from the collateral is minimal, the benefits of commodities for diversified investors will be lost.

To test Gabriel's hypothesis, we looked at the returns of the Bloomberg Commodity Index (BCOM) during periods of contango and backwardation to see if there were differences during those periods. BCOM Index provides a broad-based exposure to commodities. The exposure to each commodity is determined by economic significance, diversification, continuity, and liquidity. The target weights as of 2015 are shown below:



In order to conduct this study, we first had to discern when commodities were in contango and when they were in backwardation. Each commodity trades with a



distinct futures contract, so some commodities may be in contango when others are backwardated. To determine whether commodities in general were in contango or backwardation, we looked at 21 of the 22 commodities that make up the BCOM Index (Data Courtesy of Credit Suisse Asset Management). The only contract missing from the study was Soybean Oil due to the unavailability of data. The roll yield returns on each commodity were added daily. When the combined roll yield was negative, commodities were in contango. When the roll yield was positive, commodities were in backwardation. We then compared the returns when the Index was in contango to the returns of the Index when in backwardation. To make the comparison, we conducted a two sample t-test, which compares the average daily returns of the two different samples, to determine if there is a statistical difference. We analyzed data going back to the beginning of 2000.

RESULTS

Our analysis shows that there is no statistical difference in the returns of the Index when in contango or backwardation. Any variation is simply due to random chance.

The table below highlights the results of the t-test in which we compared the two samples, the first sample being the average daily return when in backwardation, the second being the average daily return when in contango.

	<i>Backwardation</i>	<i>Contango</i>
Mean Daily Return	-0.00033458	0.000292968
Variance of Daily Return	0.000124263	0.000184455
Observations	543	2311
Hypothesized Mean Difference	0	
df	959	
t Stat	-1.129550937	
P(T<=t) one-tail	0.129473973	
t Critical one-tail	1.646444087	
P(T<=t) two-tail	0.258947945	
t Critical two-tail	1.962440749	

Line 3 shows the number of days included in each sample. As you can see, the data highlights the fact that commodities have been in contango most of the time since 2000.

Line 1 shows the average daily return of each sample. Line 2 shows the average variance in the daily returns. For there to be statistical evidence that the backwardation returns were higher than the contango returns, the positive value of the t stat (line 6), has to be larger than the t critical one-tail (line 8). As you can see, it is not ($1.129 < 1.646$); therefore, there is no statistical evidence that the index underperformed during times of contango versus backwardation. In other words, the difference in the mean daily return is simply due to random chance.



CONCLUSION

While roll yield is a significant component of the return from investing in commodities futures, using roll yield or contango vs. backwardation of the commodities market as a determinant to invest does not provide better returns. Roll yield is only one component in the return, and as the data indicates, using the roll yield of the commodities market is not a useful indicator to predict future returns.

The results of our research are disappointing, for we cannot develop a strategy to exploit a difference if that difference does not exist. However, our research will not stop here. Recent studies into the state of commodity inventories and on the difference in returns based on monetary policy suggest that a tactical strategy might be possible. We will pursue these possibilities in our continual effort to improve our risk adjusted returns.

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