Thoughts on Investing in Commodities

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Commodities consist of the basic natural resources that we use to power our lives:

- Energy: oil and natural gas
- Industrial metals: aluminum, copper, lead, nickel and zinc
- Precious metals: gold and silver
- Agriculture: wheat, corn, soybeans, cotton, sugar, coffee and cocoa
- Livestock: cattle and hogs.[1]

These materials serve as the building blocks for our global economy. Over the years our society has figured out ways to use them more efficiently, but we have not yet devised meaningful, effective substitutes.

Nearly seven years ago, we laid out our thesis that commodity prices were poised to rise sharply in the face of depleting natural stocks and population growth in emerging markets. Since that time, the price of oil has increased from $35 per barrel to $100 (with a brief visit to ~$150 in between), the price of copper has gone from $1.30 per pound to over $4.00, and central Appalachian coal prices have gone from $30 to $70.[2]

Longer-term, it appears that the core drivers of this thesis remain intact. It seems possible that we will soon reach the "peak oil" inflection point. Even if this is not the case, it is clear that new fields coming online will cost much more to tap than those going offline (it costs a lot more to pump oil at 500 feet below sea level in the Gulf of Mexico than in a barren field in West Texas). Populations in China and India continue to grow and, more importantly, each incremental dollar of income earned there is much more commodity-intensive than one found in developed nations.

This is not to say that there aren't threats to this thesis. In the short-term, a slowdown in global economic growth would no doubt have an impact on commodity prices. With Europe likely entering a recession and China flirting with the potential collapse of a credit bubble, near-term declines in the demand for commodities could be imminent. China has been a large accumulator of commodity resources over the past couple of years and any pause in their activity could have a meaningful impact on commodity prices. We also continue to believe that broader inflationary pressures are more of a longer-term concern than near-term as the world continues to de-lever (a deflationary phenomenon).

We also hope that today's and tomorrow's engineers and scientists can devise innovative solutions that make resource shortages much less concerning. Yet while we are still optimistic that innovation will continue to bear fruit in the future as it has in the past, the challenges will not be minor. Even if the world economy slows down and science is successful with new energy and resource technologies, the world of cheap hydrocarbons and metals has likely passed and higher prices in the future remain a likely outcome.

[1] Components of the S&P Goldman Sachs Commodity Index. This list is not inclusive of all commodities.
[2] Sources: U.S. Energy Information Administration, U.S. Geological Survey. Oil is West Texas Intermediate Crude, coal is bituminous coal.

This creates a challenge for society at large. For consumers, it means potentially higher prices. For investors, it means headwinds for bond portfolios where nominal coupon payments do not adjust for inflation and difficulties for stock portfolios where corporate valuation multiples and margins may be pressured by higher input prices.

As a result, investors have increasingly looked to diversify their core stock and bond portfolios with "real assets," which include commodities as well as real estate and timber. Research has shown that commodities have historically served as an effective portfolio diversifier that:

(a) Generated returns on par with stocks at risk levels between stocks and bonds
(b) Exhibited low correlations with stocks and bonds, leading to positive effects on portfolio risk and return characteristics when combined with stocks and bonds
(c) Performed better than stocks and bonds during periods of unexpected inflation.[3]

The average endowment commits north of 10% to real assets, with even higher allocations at major universities.[4] From 2002 to 2010, the amount of funds invested in broad based commodities programs rose nearly 20% per annum, a phenomenal growth rate.[5] Over that time period, the Pimco Commodity Real Return Strategy Fund, a flagship fund in the space with approximately $24 billion in assets under management currently,[6] returned 9.9% per annum versus just 3.5% for stocks.[7]

Unfortunately, while there is a strong case to be made for including an allocation to commodities in investment portfolios, investing in commodities presents investors with more complexities than other asset classes. This white paper outlines our current thinking on relevant issues. The concepts involved can be a bit challenging to dissect and the discussion is quite technical. Our conclusion, though, is rather straightforward: the most popular way to access commodity exposure today – through mutual funds and exchange-traded funds (ETFs) that purchase futures contracts on underlying commodities – has become a victim of its own success.

More specifically, the massive flow of assets into this particular investment strategy has fundamentally altered its investment characteristics, rendering it a much less attractive way to gain exposure to commodities. During the dot-com craze, there were many fundamentally sound companies that turned out to be horrible investments because investor enthusiasm for the stocks drove their prices to unjustifiable levels. While the issues we identify in commodity futures mutual funds and ETFs don't rival the dot-com bubble, they present their own set of challenges, specifically because retail and in some cases even professional investors seem to have basic misunderstandings about how these investments work. Crowded investment ideas may give the investor comfort, but rarely do they produce stellar investment returns.

Note that we are not saying commodity prices are too high, but that the most popular way to gain access to commodities appears to have some serious drawbacks that have become more acute recently. In other words, we believe that these investment vehicles could perform poorly *even if* commodity prices continue to rise.

Accordingly, we have altered our approach to the investment class. We still believe that the investor should strive to maintain commodity exposure in their portfolio, but only if the investments made produce acceptable returns even in a world of flat commodity prices.

We have therefore exited commodity futures investments, which served us well over the past decade, and have opted instead to focus on purchasing resource-based companies to gain commodity exposure. We believe that this approach will continue to provide protection against rising commodity prices while producing a superior intrinsic rate of return. In the words of David Swensen, Chief Investment Officer of Yale University:

> In order to gain commodity exposure without betting exclusively on prices, savvy investors structure portfolios around value-added purchases of well-defined energy reserves operated by superior management teams.[8]

The discussion that follows provides the details of our reasoning for this move for those with interest. We also want to remind investors that commodity exposure is not the only way to protect portfolios against inflation. Other real assets, including TIPS and real estate, also have historically performed well in inflationary periods. And while stocks have turned in a mixed performance during

[3] See *Facts and Fantasies about Commodity Futures*, Gorton and Rouwenhorst, 2005. These conclusions are based on a long-only commodity futures strategy.
[4] *The Yale Endowment 2010*. Yale is targeting 20% in Real Estate and 9% in Natural Resources for 2012. Notre Dame targets 17.5% in real assets, which includes real estate, energy and commodities.
[5] Based on commodity futures programs, private source.
[6] Morningstar report dated November 30, 2011.
[7] As defined by the S&P 500. *Bloomberg Financial Markets*.
[8] *Pioneering Portfolio Management*, David F. Swensen, Simon & Schuster 2009, p. 212.

such episodes, we believe companies that (a) are purchased at attractive valuation multiples and (b) combine a strong degree of pricing power with high margins, attractive returns on capital and modest required capital expenditures will do quite well in the face of higher inflation.[9] While we don't see inflation as a near-term threat, we nonetheless want to build portfolios that can withstand any potential storm. You don't want to buy flood insurance after it starts raining.

Technical Discussion – A Review of Different Approaches to Commodity Investing

There are three basic ways for investors to gain exposure to commodities:

1. Invest directly in commodities or commodity-producing assets.
2. Invest in portfolios of long-only futures contracts on underlying commodities.
3. Invest in publicly-traded stocks of companies that produce commodities.

Direct Ownership

For the vast majority of commodities, it is impractical for investors to gain access by directly buying and storing them. For example, we are incapable of purchasing barrels of oil, storing that oil (at a cost) and later selling it back into the market at a time of our choosing. With oil around $100 per barrel, we would have to own tens of thousands of barrels to make a meaningful investment. And this is ignoring the fact that we would want a diversified basket – i.e. exposure to a number of different commodities. For those of you who have visited our office, you can imagine that it wouldn't be very practical to have hogs or cattle in the backyard and coal stored in the basement.

The exception to this rule is precious metals, such as gold and silver, whose high value to weight ratios make it possible to store a meaningful dollar amount in a small space. Indeed, the advent of ETFs like the SPDR Gold Trust (GLD) allow investors to purchase fractional interests in physical gold stored in vaults the same way they buy stocks on the open market.[10] That being said, precious metals are just a small part of the overall commodities landscape and are driven by different factors than the other "industrial" commodities.

Now it is possible for investors to purchase private ownership interests in natural resource projects, such as oil and gas wells, mines and occasionally even bulk storage concepts. We have experience in such areas and hope to expand our efforts here in the future. However, it is difficult for most investors to participate in these projects as investment minimums are typically large and investment commitments are not liquid. Further, investors must be sure that they fully understand the terms and conditions of the projects they are participating in and we would also suggest caution around more speculative projects that haven't established proven productive capacity. In conclusion, direct ownership can be an attractive avenue for gaining commodity exposure, but it is typically only accessible by large, institutional investors.

Futures Strategies

As mentioned earlier, the most popular way to access commodity exposure is through mutual funds and ETFs that purchase futures contracts on underlying commodities. At the end of 2010, one source estimated approximately $350 billion was managed under such programs.[11] Futures contracts sometimes scare investors. But the futures contracts included in these strategies have several notable differences from the ones portrayed as extremely risky and opaque in the popular press.

A futures contract is simply an agreement to buy or sell something at an agreed upon price on a specified future date. For instance, if I buy ("go long") a $100, one-month futures contract on oil, I am agreeing to purchase a barrel of oil from someone in exactly one month for $100. If the price of oil goes up to $105 or down to $95, I still pay $100, thereby either profiting or losing $5. (In practice, I would sell the contract just before the expiration date to avoid actually taking delivery of the oil.)

These contracts have several notable differences with the futures contracts that make headlines:

- First, the contracts are standard, exchange-traded contracts with very deep and liquid markets. Many of the derivative contracts that got people

[9] (a) Lower inflation typically corresponds with lower risk-free interest rates which translate into lower discount rates and accordingly higher valuation multiples. When inflation increases, so do interest rates and discount rates, leading to lower valuation multiples and providing a discrete shock to stock market returns; (b) Companies with pricing power, higher margins and modest re-investment requirements are at much less risk of being hurt by inflation, as there exists less threat to cash flows from growth rates in costs outpacing growth rates in revenues.

[10] Indeed, the advent of the SPDR Gold Trust ETF (GLD) in 2004 seems to coincide nicely with the subsequent rise in the price of gold. It is unclear to what degree GLD has been a causal factor, but we would expect this "financialization" of the metal to lead to much more volatile price movements in the future. In the past, investors would have to lug their gold from their local safe-deposit box and find a place to sell it; now they can just click a button on the computer.

[11] Private source.

into trouble during the financial crisis were opaque, over-the-counter (customized) contracts with illiquid markets and complex details. The basic commodity futures contracts trade in huge, deep markets under simple, standardized terms. There is a centralized clearinghouse that acts as a middleman for all trades, helping reduce systemic risk. The contracts are also marked-to-market daily, meaning that gains and losses are recognized immediately (and counterparty risk therefore greatly reduced).

- Second, and most important, the contracts are fully collateralized, meaning that for every dollar of notional contract value there is a dollar of cash or high-quality securities backing it. For instance, if I enter into a futures contract for $100 oil, I have $100 in my account at the trading firm in cash or highly liquid, low-risk securities. Every story we have heard of huge losses in futures or commodities involves investments made on margin, i.e. backed with less than the full amount of the contract, which greatly magnifies gains and losses (just like investing with borrowed money).

These characteristics make the mutual fund and ETF securities that trade commodity futures a bit confusing but nonetheless standard and we believe safe in terms of asset security. At the end of the day, such fully-collateralized futures contracts resemble a buy and hold strategy in the underlying security, whether it be oil, copper or IBM Corporation (which also has standardized futures contracts on it). However, in terms of return, there are some subtle, yet important differences between owning the commodity directly and purchasing it via the futures market. The futures approach has three basic components of return:

- *The spot price*: To the extent that the underlying price of oil changes, the futures contract will record gains or losses. (Spot price refers to the current price of the commodity; e.g. oil is currently priced at a spot price of $103.[12])
- *The yield on collateral*: The futures contracts are fully collateralized, typically through short-term Treasuries or other bonds. Accordingly, the investor earns interest on these bonds.
- *The roll yield*: This can be a confusing concept, but we think the simplest way to think about it is as an "insurance premium" for providing price guarantees to people on the other side of the futures contract.[13]

John Maynard Keynes explained the insurance premium in 1930:

> [A] world in which producers of commodities would seek to hedge the price risk of their output. For example, a producer of grain would sell grain futures to lock in the future price of his crops and obtain insurance against the price risk of grain at harvest time. *Speculators would provide this insurance and buy futures, but demand a futures price which is below the spot price that could be expected to prevail at the maturity of the futures contract*. By "backwardating" the futures price relative to the expected future spot price, speculators would receive a risk premium from producers for assuming the risk of future price fluctuations. [emphasis added][14]

Historically, futures-based strategies significantly outperformed buying and holding the underlying commodity because both the interest earned on collateral and the insurance premium were strong positive contributors to return. The insurance premiums in particular provided a notable tailwind to commodity futures investments. Yale professors Gary Gorton and Geert Rouwenhorst found that over the time period 1959-2004, a basket of commodity futures investments outperformed the comparable spot (i.e. physical) investments 3-to-1.[15] However, over the last several years, two things have occurred:

(a) Interest rates have collapsed so that the yield earned on collateral is effectively 0%.
(b) The large flow of assets into commodity futures appears to have greatly depressed insurance premiums and indeed perhaps turned them negative. Like any insurance market, the more capital competing to provide insurance the worse the returns, possibly even pushing them into negative territory. While these insurance premiums aren't directly observable, the presence of significant "contango" in the market, where futures prices are consistently *higher* than current spot prices, suggests positive insurance premiums have contracted or disappeared.

GMO, a value-based institutional investment management firm, has estimated that over the last several years negative insurance premiums have detracted around 10% from commodity futures returns cumulatively (not including

[12] West Texas Intermediate as of January 9, 2012, U.S. Energy Information Administration.
[13] This is an oversimplification but serves the purposes of this paper.
[14] See *Facts and Fantasies about Commodity Futures*, Gorton and Rouwenhorst, 2005.
[15] Ibid.

2011).[16] So even if one is correct in predicting that commodity prices will rise in the future, the popular "commodity" ETFs and mutual funds that so many investors rely upon may still produce disappointing returns, as the collateral yield will provide no return boost and negative insurance premiums may offset rises in commodity prices.[17] Due to this phenomenon, we believe that such investment programs have lost their appeal for prudent, long-term investors.

Publicly-Traded Resource Stocks

Commodity bulls have tended to not embrace the idea of purchasing publicly-traded stocks of natural resource companies. They argue that:

- This introduced company-specific risk factors into the investment thesis. For instance, oil prices may rise but shareholders may nonetheless fail to benefit if company-specific factors get in the way (e.g. BP oil spill).
- Portfolio diversification benefits would be reduced relative to direct commodity investments as resource stocks showed relatively higher correlations to broader equity markets than futures-based commodity investments.
- It can be difficult to understand many publicly-traded resource stocks, including what natural resource assets they actually own, how politically safe those assets are and to what extent they are "short" other natural resources required to produce/mine their assets.

When we originally established our thesis for investing in commodities, we were still weighing the validity of these arguments. We did invest in a handful of resource companies that we felt we understood, were operated by strong management teams and had meaningful positive exposure to commodities that we thought were attractive. Over the past decade, these companies have returned between 13-21% per year.[18] Indeed, resource stocks in general have shown an ability to benefit from rising commodity prices, as the energy sector of the S&P 500 outperformed the broader S&P 500 by nearly 10% per annum over the same period (12.6% per year versus 2.9%).[19]

Yes, investing in individual companies does introduce company-specific risk factors, but we believe we can offset this through our fundamental analysis and holding at least a couple of different resource stocks. Second, while short-term portfolio diversification does appear to suffer, the last 10 years illustrate that resource stocks can provide meaningful *intermediate*- to *long-term* diversification, which we believe is more important. Finally, we focus our efforts on companies that we believe we can understand and assess. We agree that some of the super-large, global resource companies can be difficult to properly understand and value. However, there are a number of smaller, understandable companies with assets in politically safe regions. For instance, this past year we purchased shares in an economically-advantaged domestic coal producer at prices we found attractive. The company is just north of $1 billion in market capitalization and should benefit from rising coal prices in the future. We purchase such companies targeting attractive rates of return assuming only modest increases in commodity prices; sizable price increases would drive returns higher.

Accordingly, we have altered our commodities investment strategy – we have completely exited our commodity futures program in favor of investments in resource companies that we feel we can understand and value. We believe that this approach will still help protect our portfolios from the risk of rising commodity prices while providing adequate returns even if the threat turns out to be less serious than previously thought.

[16] *Back to Basics: Six Questions to Consider Before Investing*, Inker, October 2010.

[17] There have been certain "second and third generation" mutual funds and ETFs launched in the last few years that attempt to overcome these challenges by introducing more flexibility into what futures contracts can be purchased, both by month and underlying commodity, relative to first generation funds, which focus on front-month contracts and rigid allocation weights. These funds have produced initial successes, do appear superior to first generation funds and we believe may perform well in the future. But as GMO writes, "[A] number of companies have come up with new commodity indices to try to avoid this problem. Some of them may succeed in this, at least until they too become popular enough to destroy the effect they are trying to exploit. In the absence of a compelling reason for the participants to accept the negative returns associated with taking the other side of a particular commodity strategy, none of these strategies can be considered a source of long-term returns." *The Hidden Risks of Risk Parity Portfolios*, Inker, March 2010.

[18] We did not own each stock during the entire time period; *Bloomberg Financial Markets*.

[19] XLE versus the SPX Index, *Bloomberg Financial Markets*.