

# Journal of Indexes

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# Commodities Still Make Sense

With or without the supercycle

By Sal Gilbertie



Recent headlines proclaiming the end to the commodity supercycle have justifiably led some financial advisors to ask if we are in a “new” commodities environment, and if a re-examination of the role of commodities in an index-based portfolio might be warranted.

Supercycles, often referred to as supercycle expansions, are quite well defined in Erten and Ocampo’s 2012 treatise<sup>1</sup> as:

“...decades-long, above-trend movements in a wide range of commodity prices.”

The authors further state:

“Super cycles differ from short-term fluctuations tied to microeconomic factors in two ways. First, they tend to span a much longer period of time with upswings of 10-35 years, generating 20-70 year complete cycles. Second, they are observed over a broad range of commodities...”

Given the long time horizons and varying ranges associated with the empirical analysis of supercycles, the relevance to an investor of predictions stating that the current commodity supercycle is over is open for debate; but such debate may be unwarranted and nonessential when viewing the use of commodities as a diversifying agent in a portfolio. Any investor exempting commodities from his or her portfolio for a period of 10 to 35 years (the empirically defined downswing in a supercycle) certainly does so at their own risk. Long-term investors should closely consider the potential benefits of allocating to commodities before dismissing the asset class altogether.

The fact that supercycles are often “observed over a broad range of commodities” lends credence to the widespread use of broad-basket commodity indexes by investors, initially popularized in the 1990s by early indexes like the Goldman Sachs Commodity Index (“GSCI”)<sup>2</sup> and the Dow Jones-AIG Commodity Index (“DJ-AIGCI”)<sup>3</sup> as a means to obtain commodities exposure.

And, in fact, more than \$1.2 billion of new investment dollars flowed into multicommodity exchange-traded funds<sup>4</sup> this past July alone—after multiple claims of the death of the commodity supercycle.<sup>5</sup>

## Continuing Demand Growth For Commodities

What might be driving the continued demand for commodities in a portfolio? A cursory look into the world of commodities reveals that the ever-growing interest in commodities as a viable investment class should come as no surprise; the present commodities environment is driven by very significant global-macro supply and demand factors, of which investors are becoming increasingly aware.

On the demand side, major long-term fundamental trends such as global population growth, economic growth in developing countries, and an increasing diversity of use for agricultural commodities—to name only three—require commodity supply to not only expand, but to become more consistent and reliable over time.

Population growth alone provides a compelling argument for including commodities in a portfolio. An increasing population naturally requires more commodities: more energy, more food, more construction materials, more land and more water.

The global population increases by about 78 million people per year.<sup>6</sup> Further, based upon the USDA estimates for 2013-2014, current annual demand per person is approximately 5.2 bushels of corn, 1.4 bushels of soybeans and 3.6 bushels of wheat for every man, woman and child on Earth.<sup>7</sup> Therefore, at current yield per acre and demand levels, there is the need for about 26 total additional acres of arable land every minute for these three grains—nine acres for corn production, six for soybeans and 11 for wheat. This translates to an additional amount of arable land twice the size of Massachusetts needed every year to keep pace with demand and grow these three crops alone.<sup>8</sup>

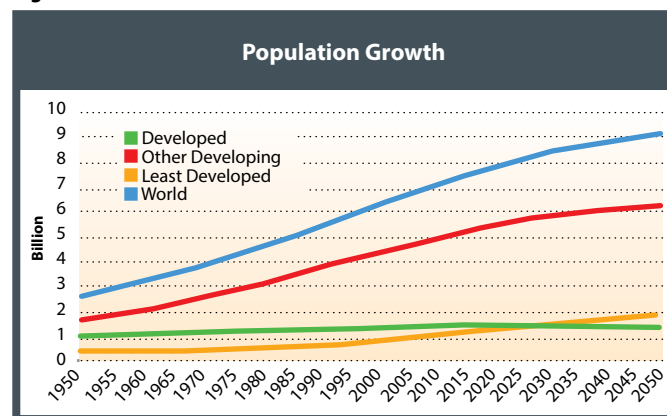
Population increases also result in growing demand for sugar, coffee, rice, cocoa and all other agriculturally related commodities. In fact, there is an interesting corollary event to an expanding population in economically emerging countries. One of the changes people make in their lifestyle with their first bit of disposable income is to increase the amount of protein in their diet. This increase in protein consumption raises demand for meat, and most meat-based protein requires some form of agricultural products as a food source.<sup>9</sup>

Incredibly, in 2011, the Brookings Institution, by broadly defining “middle class” in 145 different countries using relative versus absolute definitions of spending power of between \$10 and \$100 per day, projected the global middle class will rise in number from around 2 billion in 2009 to almost 5 billion by 2030.<sup>10</sup>

The combination of steady global population and economic growth (Figures 1 and 2) establishes the foundation for expanding demand across virtually all major commodity classes. Expanding economies, particularly those in developing and emerging nations, require vast amounts of resources just to “catch up” to developed countries’ per-capita use of commodities. This occurs because in developing economies, those persons rising up from simple base-subsistence living to a position where they have some disposable income available for quality-of-life improvements, i.e., a growing middle class, tend to use commodities at a much higher rate than previously.<sup>11</sup>

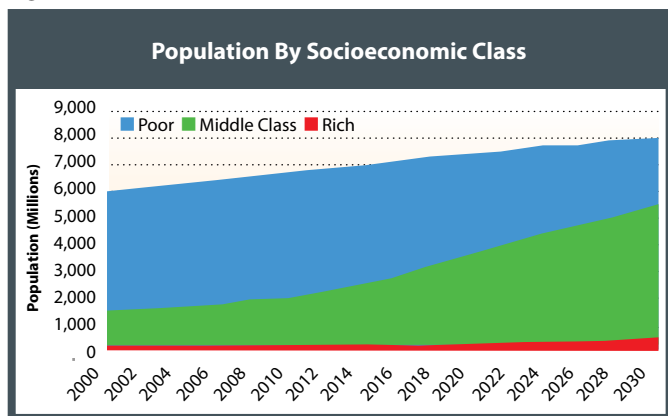
An increase in demand for goods such as energy, base metals and lumber comes from building out physical

Figure 1



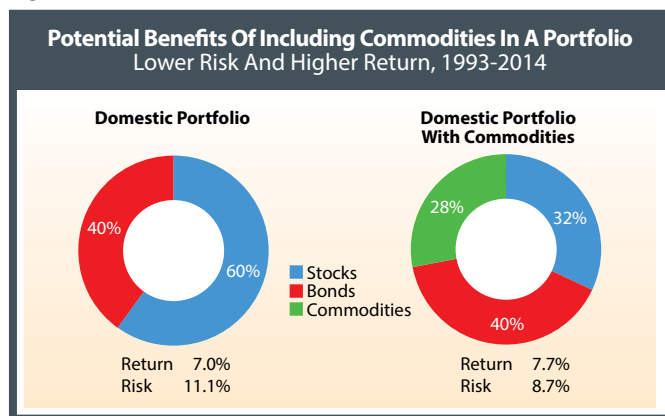
Source: UN Population Division, from van der Mensbrugge et al. 2009

Figure 2



Source: Brookings Institution

Figure 3a



Sources: Teucrium Trading LLC and Bloomberg as of Aug. 1, 2014 **Past performance does not guarantee future results. Not representative of any Teucrium product.**

Figure 3b

	Potential Benefits Of Including Commodities In A Portfolio Lower Risk And Higher Return, 1993-2014					
	10-Year			20-Year		
	Return	Risk	Sharpe Ratio	Return	Risk	Sharpe Ratio
<b>Domestic "60/40" Portfolio</b>	5.4%	9.7%	0.049	7.0%	11.1%	0.077
<b>Domestic Portfolio W/Commodities</b>	5.7%	9.0%	0.091	7.7%	8.7%	0.179
<b>% Change</b>	6.4%	-6.9%	84.0%	10.2%	-21.3%	132.9%

Sources: Teucrium Trading LLC and Bloomberg as of Aug. 1, 2014 **Past performance does not guarantee future results. Not representative of any Teucrium product.**  
**Notes:** Stocks in this example are represented by the S&P Index. Bonds are represented by the Bloomberg/EFFAS US Gov't 3-5 Year Total Return Index. Commodities are represented by Morningstar Long-Only Commodity Index. All portfolios were rebalanced annually based off the closing prices from the final trading day of the calendar year. In this particular study, risk is defined as the standard deviation of annual returns for the corresponding portfolio. The Sharpe ratio describes how much excess return an investor receives for the extra volatility, or risk, they endure for holding a riskier asset. The ratio is calculated by subtracting the risk-free rate from the rate of return for a portfolio and dividing the result by the standard deviation of the portfolio returns.<sup>14</sup>

infrastructure like cities, transport and housing. Later, as developing economies continue to expand and disposable incomes rise further, the new middle class creates demands on more types of commodities, such as industrial metals (manufacturing); natural gas and coal (electricity); precious metals (jewelry, electronics, automobiles); and cocoa (chocolate). Additional demands for crude oil continue with prosperity, because more refined products (gasoline, diesel, jet fuel) are needed throughout the economy.

Interestingly, over the course of the past several years, even mature economies are creating additional demand for the main agricultural crops of sugar, corn, soybeans and wheat. This is not just from the increased use of ethanol (sugar, corn, wheat) and biodiesel (soybeans) for motor fuels, but because myriad other industrial uses have become increasingly reliant on agricultural sources as feedstock for their vital material components.<sup>12</sup> For example, most people are aware that corn is used to feed animals, make ethanol and create corn-based sweetener, but most are unaware that corn's third-largest global use is to make the starch that holds paper together, and that corn is even used now to make recyclable plastic.<sup>13</sup>

### The Stocks, Commodities, Bonds Portfolio

Fundamental supply/demand factors may be reason enough to override dire predictions of the end of the com-

modity supercycle and include commodities as a diversifier in one's portfolio, but statistical analysis also proves the efficacy of portfolio diversification with commodities.

In the study outlined in Figures 3a and 3b, we compared the traditional 60/40 portfolio benchmark comprising 60 percent stocks (in this case represented by the S&P 500 Index), and 40 percent bonds (represented by the Bloomberg/EFFAS US Gov't 3-5 Year Total Return Bond Index) to a portfolio that substitutes some stock holdings with a broad basket of commodities (represented by the Morningstar Long-Only Commodity Total Return Index).

To be precise, our 32/28/40 portfolio has 32 percent stocks, 28 percent commodities and 40 percent bonds. In this way, we have left the traditionally more stable assets (bonds) untouched, and simply replaced some of one class of traditionally volatile assets (stocks) with another class of traditionally volatile assets (commodities).

The results of including a healthy allocation of commodities in a long-term portfolio are quite consistent over both 10- and 20-year time frames.

Using the 20-year example in Figure 3b, as an example, we see the absolute performance of a 32/28/40 allocation is slightly higher (+10 percent) than that of a simple 60/40 benchmark portfolio, but perhaps more importantly, there is an even greater reduction (-21 percent) in overall portfolio volatility.

The reduction in volatility, coupled with the modest increase to returns, results in a significant increase to the Sharpe ratio (+133 percent) versus the 60/40 benchmark portfolio. In our analysis, we've used standard deviation as the measure of volatility in the portfolio; use of the standard deviation as a measure of risk enables us to compute the individual Sharpe ratios of the two portfolios to gain a quantifiable comparison of returns versus risk in each portfolio. In the portfolio containing commodities, the Sharpe ratio is higher, indicating that returns relative to the amount of risk assumed by the commodities-inclusive portfolio are superior to the portfolio containing only stocks and bonds. Thus we see that the inclusion of a large allocation to commodities in a portfolio substantially improves risk-adjusted performance. Why might this be the case? The answer is more logical than one might initially suspect.

### Offsetting Volatility Improving Risk-Adjusted Returns

Many investors believe commodities are too risky, or perhaps too volatile, to have a place in a long-term portfolio allocation strategy. However, when two volatile asset classes within the same portfolio—in this case, stocks and commodities—are affected differently by the same fundamental factors, it follows that substituting a portion of one class of volatile investments with the other will likely be effective in reducing the overall portfolio volatility. In this way, commodities and securities are, in fact, quite complementary when paired together in an investment portfolio.

Specifically, if the reaction of stocks to certain fundamental inputs is opposite of what happens to commodities given those

same fundamental inputs, then the two asset classes—however volatile they each may be individually—tend to offset one another's effect on the overall volatility within a portfolio.

For example, lower energy costs often contribute to improved bottom-line results in many companies; if lower or stable energy inputs help to improve profits, then values may improve in certain securities within the portfolio, but values will decline or be stable in energy-related commodities within that same portfolio, hence offsetting volatilities between all energy-related holdings.

In another instance, rising agricultural prices could have a negative effect on the prices of food-industry-related securities. Rising coffee prices could adversely affect retail coffee purveyors, just as rising grain prices might negatively affect poultry and hog producers. Restaurant chains could be detrimentally affected by the rising price of all food inputs, from cattle to orange juice. In this case, potential increases in the value of a portfolio's agricultural commodity holdings could offset potential decreases in the value of any food-related stocks, thereby reducing total overall volatility in one's food-sector holdings within the portfolio.

The statistical risk-adjusted improvement in the long-term performance of a portfolio containing a broad basket of stocks coupled with an almost equally weighted broad basket of commodities is perfectly logical. Commodities are the basic building blocks of all products; the broad commodity sectors of energy, agriculture, industrial metals and precious metals are all produced, used and purveyed by a wide variety of companies whose securities are held in virtually every investment portfolio.

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## Figures

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## Endnotes

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## Global Population Growth & the Demand for Grains – Quick Facts

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- **Approximately 13.3 million additional acres would need to be cultivated** (about twice the size of Massachusetts) **producing a combined 800 million bushels of corn, soybeans & wheat just to supply the global population growth estimated for a full year.**<sup>1</sup>
- The global population **increases by about 2.45 persons every second, 147 people per minute** and, based on this estimate, **about 77 million people per year.**<sup>2</sup>
- Based upon the USDA estimates for 2014–2015, current annual demand per person is approximately 5.3 bushels of corn, 1.5 bushels of soybeans & 3.6 bushels of wheat for every man, woman & child on earth.<sup>3</sup>
- At current yield per acre & demand levels, this results in the need for about **26 total acres every minute in additional arable land** for these three grains alone - 9 acres for corn production, 6 for soybeans & 11 for wheat.<sup>1</sup>
- Supply is a function of yield per acre & arable land under cultivation.
- “Much of the suitable land not yet in use is concentrated in a few countries in Latin America and sub-Saharan Africa, but many countries with growing rural populations in these areas are extremely land-scarce, and much of the potential land is suitable for growing only a few crops that are not necessarily those for which there is the highest demand. Also, much of the land not yet in use suffers from constraints (chemical, physical, endemic diseases, lack of infrastructure, etc.) that cannot easily be overcome or that it is not economically viable to do so.”<sup>4</sup>

Sources:

<sup>1</sup>Teucrium Trading, LLC

<sup>2</sup>U.S. Census Bureau, World POPClock Projection, October, 2014. <http://www.census.gov/population/popclockworld.html>

<sup>3</sup>As reported per the USDA on the Nov 10, 2014 World Agriculture Supply and Demand Report

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