2024

Market Outlook

TEUCRIUM

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THE PROSPERITY PARADOX

Booms, Busts & Commodity Market Volatility

In order to make sense of markets, let alone the world, one must recognize that we are still living in the shadows of the Covid-19 pandemic. Global government lockdowns resulted in a major economic shock, leading to unprecedented monetary and fiscal support for both individuals and businesses. The moves helped blunt the immediate economic fallout, however record stimulus injections drove inflation[1] to 40-year highs and catapulted commodity prices higher.

Calendar years 2021 and 2022 were marked by a robust rebound in consumer demand that outstripped global supply chains which were slow to recover. The result was a global marketplace riddled with shortages and disruptions. In addition, increases in commodity prices affected the price of nearly all consumer products and services. These disparities fueled a climb in prices on a scale not seen in decades.

In 2023, the tide began to shift. The relentless rise of inflation and commodity prices showed signs of easing. The Federal Reserve's interest rate hikes acted as a brake on the economy, cooling the fervor of borrowing and spending. The dwindling effects of fiscal stimulus helped dampen inflation, with November 2023 seeing the lowest inflation rates since the pandemic's early days.

"...too much money chasing too few goods"

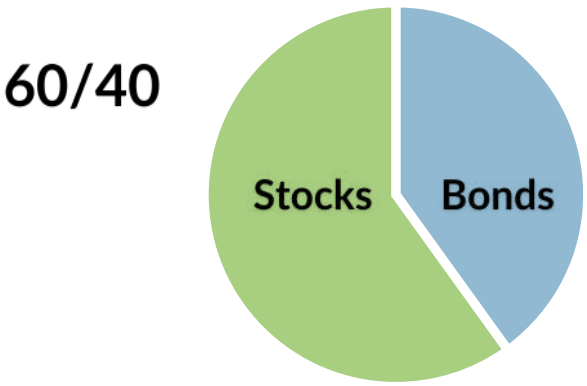
—Milton Friedman

[1] The rate at which prices climb over time.

Yet, the global economy's fate remains inextricably linked to commodity production and trade. The theme of the “Prosperity Paradox" is a reminder of the cyclical nature of economic booms and busts, and the often-volatile nature of commodity markets. Bottom–up economic stimulus creates a sense of prosperity as evidenced by increased consumer demand. However, this sense of prosperity is in peril if goods and services are not available for purchase. Supply shortages, either due to production shortfalls or to broken supply chains, mean that too much money is chasing too few goods. This, according to Milton Friedman, is the root cause of inflation.

Policymakers are walking a tightrope, tasked with supporting growth without inciting the dangers of inflation. Federal Reserve and Treasury officials will continue to be put to the test as they navigate the uncertainties of the post pandemic economy, evolving trade dynamics, and a shifting geopolitical landscape. Looking forward to 2024, the path to sustained prosperity hinges on the ability to steer through these perils, maintaining the stability that underpins both global markets and the well-being of societies at large.

Regardless of the economic outcome, commodity price volatility is likely to remain. Traders, with a keen eye on market signals and a risk appetite will embrace the volatility and look to profit from price swings.

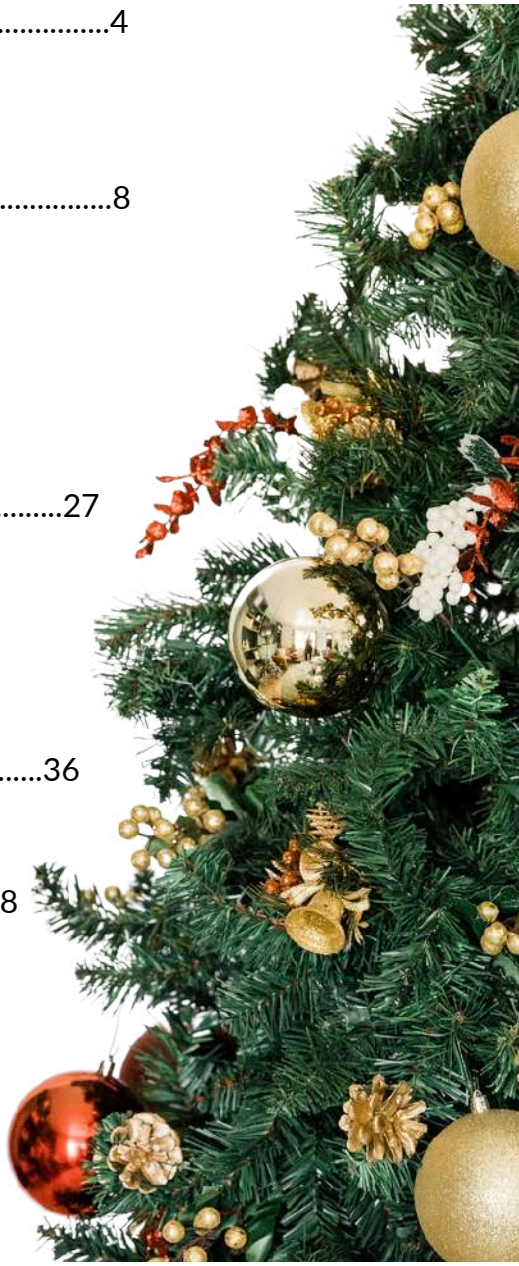


What’s more, we believe that certain long-term investors who experienced setbacks, due to the recent shortcomings of the 60/40 asset allocation framework, are presented with the imperative—and the opportunity—to recalibrate their strategies and consider alternative investments. Commodities are a popular alternative asset class historically offering low correlations to traditional asset classes.

What follows is Teucrium's 2024 commodity market outlook. We will place particular emphasis on agriculture and base metals markets. Our goal, as always, is to relate macroeconomic developments to actionable investment ideas.

First, we'd like to take a moment to thank you for your continued interest in our funds. We appreciate the opportunity to accompany you through these markets. From all of our families to yours, please accept our best wishes for a Merry Christmas, Happy Holidays, and a Joyous and Prosperous New Year!

Outline



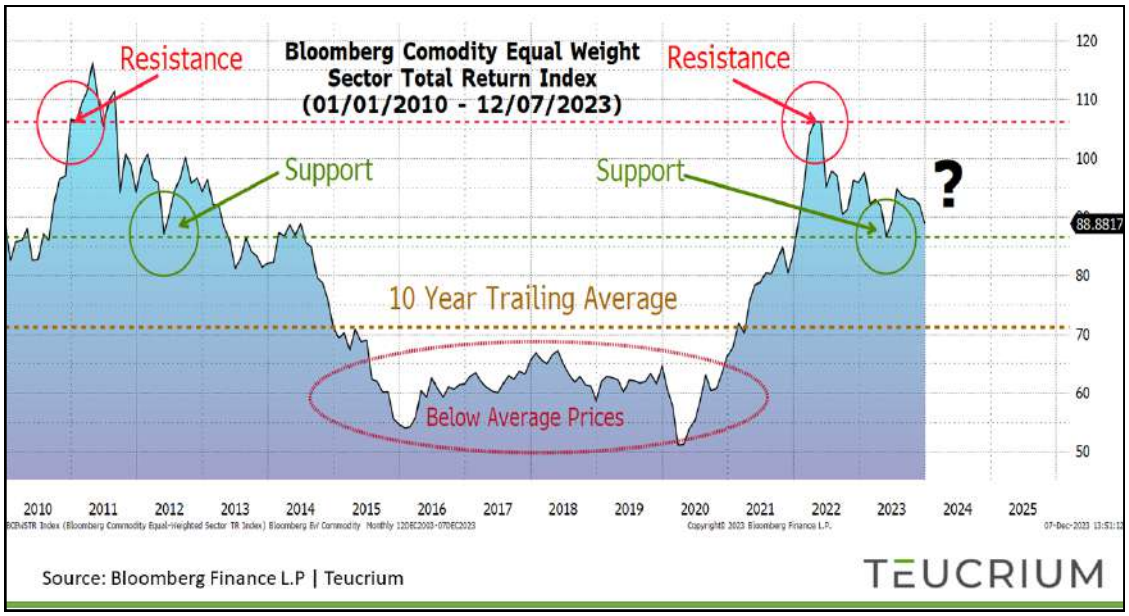
RIDING HIGH

Broad Commodity Market Analysis

As we write this commentary, commodity prices are well off their highs. Yet, persistent relatively high prices have the potential to perpetuate inflationary pressures across the economic landscape. Keep in mind that although the rate of inflation has tempered, consumer prices are still rising.

The graph below shows the Bloomberg Equally Weighted Commodity Sector Total Return Index. As an equally weighted index, all commodity prices are represented equally. Therefore, any outsized move in one commodity market, say oil for example, is not going to have an outsized impact on the index. There are 23 different commodities represented in the index, and as you can see, prices are still well above the 10-year average.

Chart #1

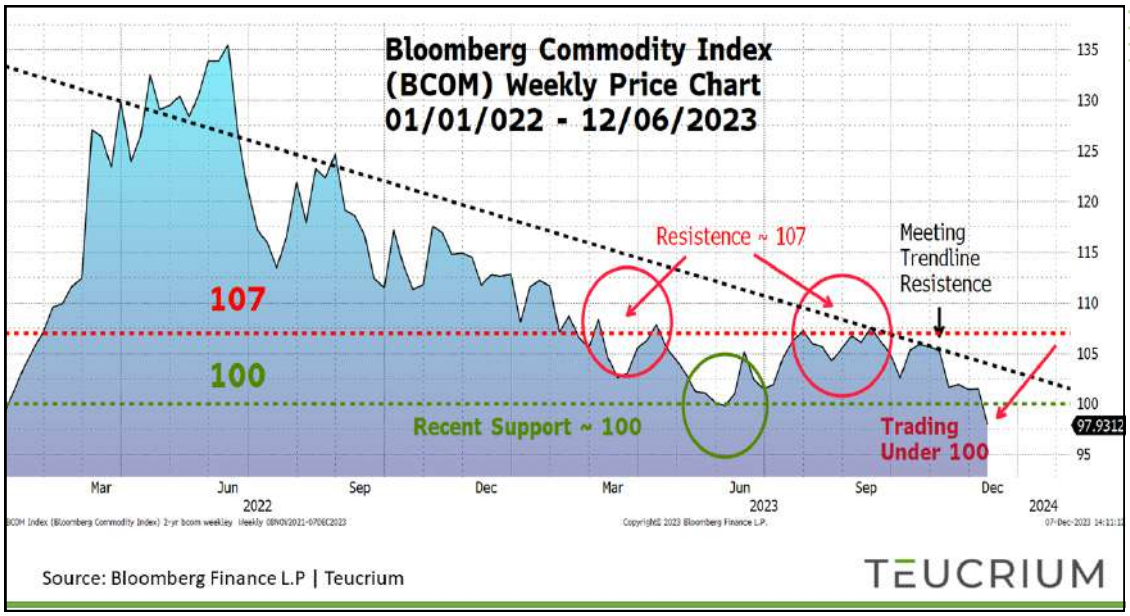


Bloomberg Equal Weight Commodity Total Return Index. - Past Performance does not guarantee future results. This chart is for informational purposes only and is not indicative of an investment in any Teucrium fund.

Even while commodity prices in general remain at historically high levels, more popular commodity indexes, such as the Bloomberg Commodity Index (BCOM) are in a clear downward trend. Note that BCOM is a production-weighted index, so outsized moves in one market, such as oil can have an outsized impact on the index level. Still, BCOM is one of the most popular and widely used commodities indexes.

BCOM is down more than 10% year-to-date (12/06/2023).

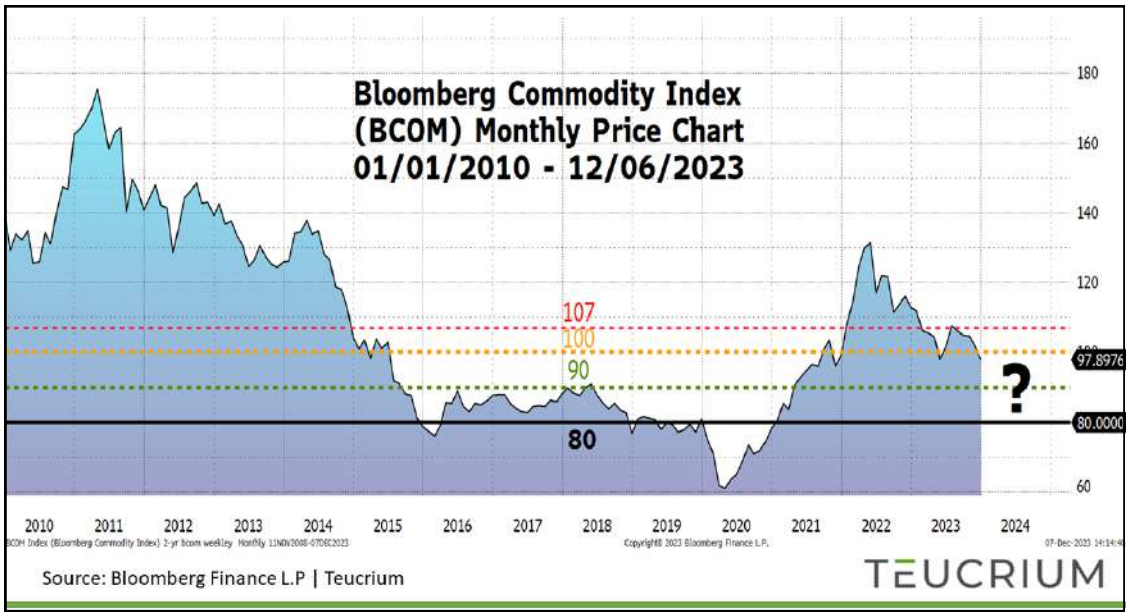
Chart #2



Bloomberg Commodity Index. - Past Performance does not guarantee future results. This chart is for informational purposes only and is not indicative of an investment in any Teucrium fund.

The recent break below 100 will likely lead to a test of the 95 level, before potentially finding support around 90. Still, BCOM spent roughly 5 years trading in a rough range between 80 and 90. The bottom line: price charts suggest that downside risks remain for commodities.

Chart #3



Bloomberg Commodity Index. - Past Performance does not guarantee future results. This chart is for informational purposes only and is not indicative of an investment in any Teucrium fund.

Funamental Drivers

The fundamentals are painting a fairly bleak picture for commodities. China, a major driver of global economic growth, has been facing a host of challenges as the country tries to recover from the infamous Zero-Covid policy. The Caixin China Manufacturing Index has spent much of the year swinging back and forth above and below the pivotal 50 level. A level above 50 signals economic expansion, below 50 an economic contraction. Year-to-date the index has averaged 50.2, equating to a “no growth” environment.[2]

It’s not just China. JP Morgan’s Global Composite PMI (Purchasing Managers Index) has been trending lower since May and currently sits at just 50.4. Still, emerging economies such as India are helping to offset the recessionary readings from developing countries. India’s manufacturing PMI is currently 56, compared to the Eurozone, for example, which reported a manufacturing PMI of just 43.1.[3]

Although emerging market economies are exhibiting resilience, it's uncertain if this vigor can offset the widely expected decline in U.S. consumer demand.

While the Federal Reserve is attempting to engineer a soft landing, i.e. slow economic growth without tipping the scales to a recession, our view is that the U.S. might, at best, expect a soft recession. Consider that total household debt has reached record levels and borrowing costs are the most restrictive they’ve been in 16 years.[4] It is clearly a question of when, not if, consumer spending will decline.

Additionally, currency market conditions, namely a strong U.S. Dollar, have the potential to exert pressure on commodity prices. A stronger dollar, all else being equal, tends to raise the price of commodities priced in foreign currencies, which therefore can depress demand and lead to lower commodity prices. While there is an increasing expectation that the Federal Reserve has finished hiking rates, maintaining rates at current levels may be enough to keep the Dollar strong relative to other currencies.

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[2] Bloomberg Finance L.P.
[3] Ibid.
[4] https://tradingeconomics.com/united-states/debt-balance-total

Chart #4

US Dollar Index (DXY). - Past Performance does not guarantee future results. This chart is for informational purposes only and is not indicative of an investment in any Teucrium fund.

There is the potential that the Federal Reserve will begin to lower interest rates over the course of 2024. In that scenario the dollar may weaken, adding support for commodity prices. However, we believe that as the Fed proves successful in moderating U.S. economic growth, and/or tipping the economy into a recession, they will err on the side of caution allowing for a prolonged downturn, even though it will be a wildly unpopular stance.

Of course, 2024 is an election year. While we like to believe that the Fed operates independent of political influence or considerations, the pragmatist in us concedes that Fed policy may be more influenced by politics than anyone cares to admit. As such, keeping interest rates higher for longer may be politically impossible.

Low, or negative economic growth, combined with a relatively strong dollar doesn't bode well for commodity prices in general. Those same factors are likely to add downward pressure to grain prices next year as well. What's more, grain prices are likely to be further impacted by increased global production and rising inventories. The fundamentals are shaping up in a way that suggests to us that 2024 will likely see grain prices enter Stage 1 of the Golden Grain Cycle.

AGRICULTURE

The Golden Grain Cycle

"Grains tend to trade at or near their cost of production until there is a supply disruption at which point prices historically have moved dramatically higher. Over time as production increases and/or demand decreases, inventories are rebuilt and prices trend back toward the cost of production once again."
– Sal Gilbertie, Founder & CEO

The Golden Grain Cycle is, at its core, cosmic. Consider that growing seasons are dictated by the tilting of the Earth's axis in proximity to the sun. As such, in the Northern Hemisphere, there is only one harvest per year.

There are years when production exceeds demand, and prices are low. Alternatively, there are years when production lags demand, and prices rise. The variability of production in the face of steady, and often growing demand, lays the foundation for the grain market cycle. This cycle has repeated throughout history, offering those who recognize the cycle an opportunity for potential profit. Hence, we refer to the cycle as the Golden Grain Cycle.

3 Stages of The Golden Grain Cycle

#1: Prices trade at or near the cost of production
#2: Prices advance amid supply/demand imbalance.
#3: Supplies build due to increased production and prices head back toward the cost of production.

Typically, grain *production exceeds demand*. Excess grain is held in storage as inventory to be drawn down in years when the reverse occurs and *demand exceeds production*.

When production exceeds demand, market prices will gravitate toward the cost of production effectively squeezing a farmer's profit margins (stage 1).[5] Lower profit margins can (and often do) result in fewer acres planted. This can lead to a situation where production may fail to keep pace with consumption in a given crop year. Historically, when grain production has lagged consumption, it has led to a reduction of inventories applying upward pressure on prices (stage 2).

[5] USDA Historical Tables are available at www.teucrium.com

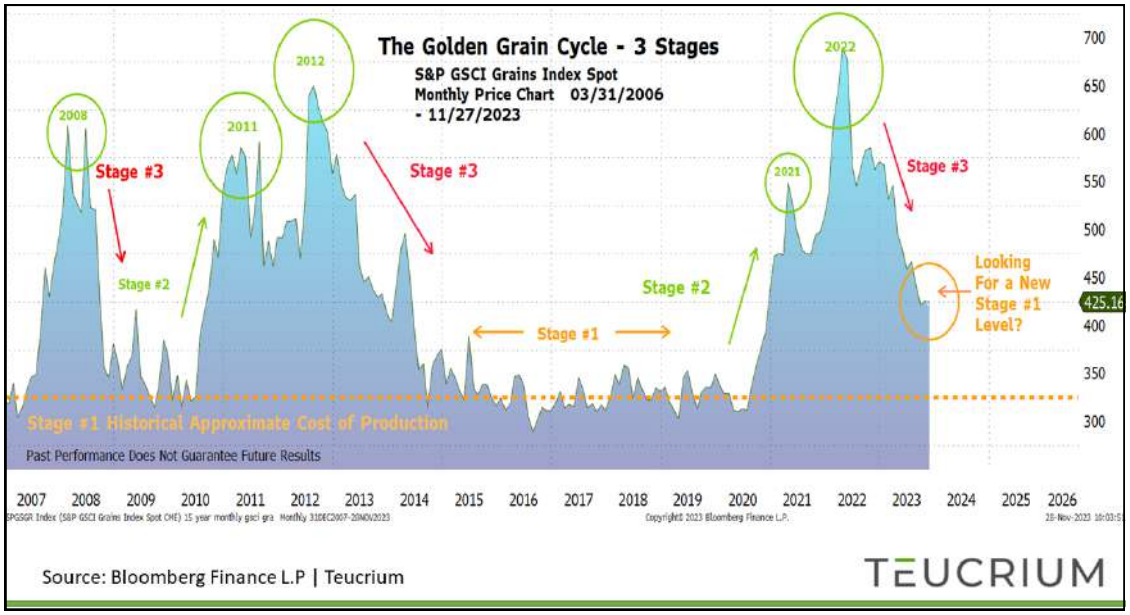
We have seen that higher prices are often the cure for high prices as farmers plant more acres in an attempt to ramp up production and capture higher prices, while end users (consumers) begin to scale back purchases out of affordability concerns related to higher prices (stage 3).

This cycle played out in textbook fashion over the previous decade (2010-2019)
In 2010 – 2012 a La Nina weather pattern led to poor growing conditions in key areas across the globe. As such, grain production lagged relative to demand and prices moved significantly higher, peaking in 2012 (see chart #5). Higher prices provided farmers with the incentive needed to plant more acres.

The additional plantings led to increased harvest and global inventories began to grow. As you can see on chart #6 below, global grain inventories grew without interruption beginning in the 2013 – 2014 crop year and going through the 2018-2019 crop year. By 2016, grain prices were back near production costs and traded sideways for the rest of the decade (Stage 1).

Then in the 2019-2020 crop year, the world consumed more corn, wheat, and soybeans than was produced. The globe didn't run out of food, but rather drew down excess inventories that had been built over the preceding 6 years (beginning Stage 2). Again in 2020-2021, for the second year in a row, the world consumed more corn, wheat, and soybeans than was produced. This led to an additional drop in inventories. Prices reacted accordingly, moving sharply higher in 2021.

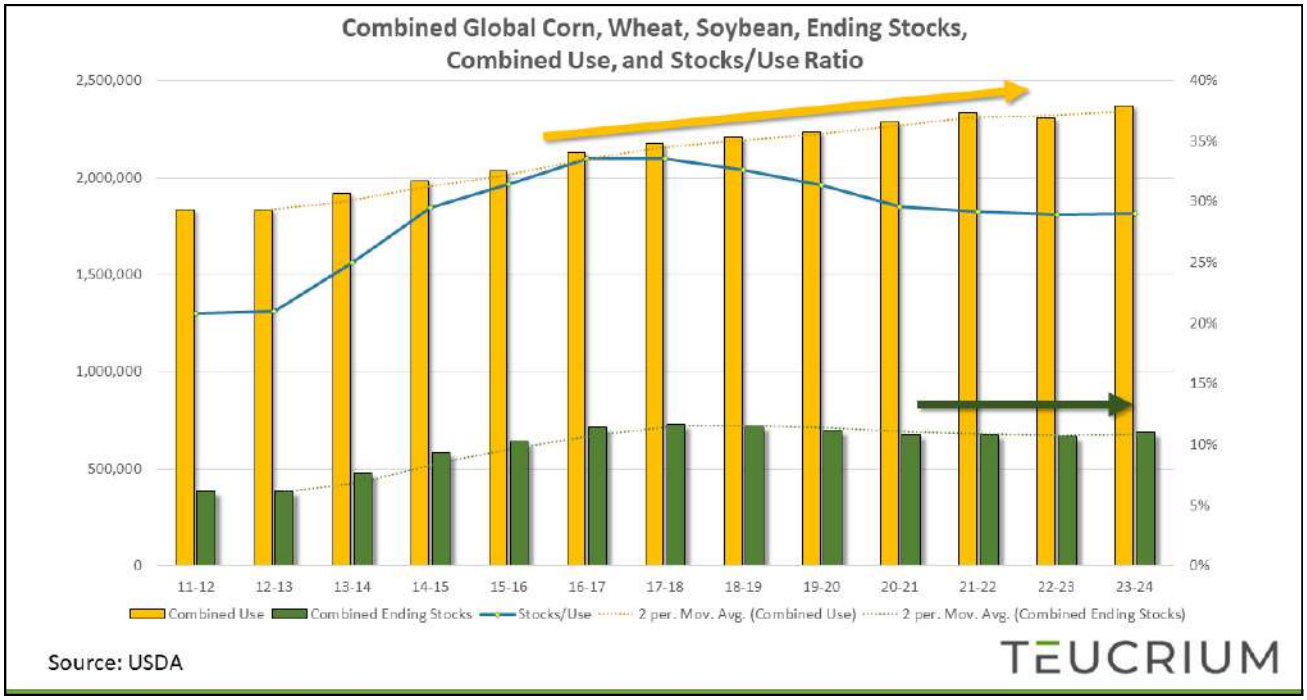
Chart #5



S&P GSCI Grains Index- Past Performance does not guarantee future results. This chart is for informational purposes only and is not indicative of an investment in any Teucrium fund.

Global ending stocks declined again in 2021-2022 while combined usage climbed to a new record high. The combined stocks/use ratio* dipped below 30% for the first time in five years (see Chart #6 below). Tight balances sheets kept markets on edge entering the 2022-2023 crop year. Prices began trending higher after the 2021 harvest and then shot significantly higher amid Russia's invasion of Ukraine.

Chart #6



Prices have since come off their highs, and the market has been in stage #3 ever since. As we enter 2024 prices will likely continue to face downward pressure before eventually stabilizing and entering the Stage #1 phase of the Golden Grain Cycle.

The price level at which prices stabilize is anyone's guess. However, in our view we're closer to that level than not. Consider that production costs in general appear to be stabilizing as is evident when looking at fertilizer prices, and energy prices more broadly. WTI crude oil is trading a mere $6 above the 10-year average, whereas natural gas prices are currently below their 10-year average. Diesel fuel, however, remains stubbornly elevated in part due to limited U.S. refining capacity, western sanctions against Russia, and a resilient American economy. Still, we believe that diesel prices will continue to face downward pressure as U.S. energy demand wanes amid softening economic conditions.

*Stocks/Use Ratio: Ending stocks divided by projected use

Chart #7

The Green Markets North American Fertilizer Price Index is a comprehensive measure that tracks and analyzes the prices of fertilizers in North America. Past Performance does not guarantee future results. This chart is for informational purposes only and is not indicative of an investment in any Teucrium fund.

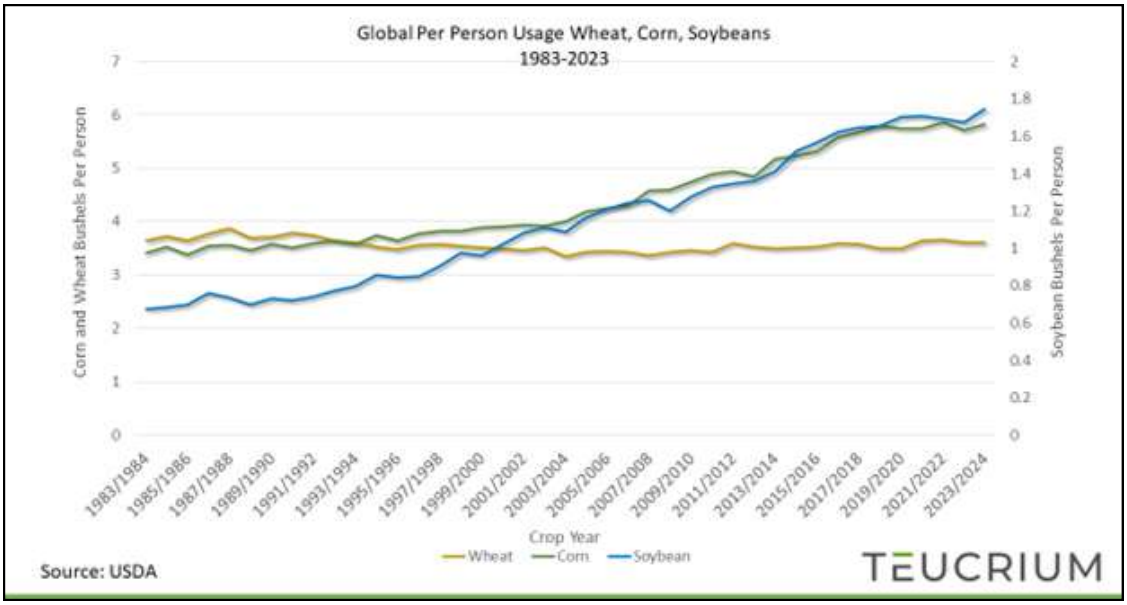
Production Keeps Up with Demand

Grain consumption has experienced steady growth over the years. However, there are periodic year-over-year decreases. For example, consumption declined in the 2022-2023 crop year versus the preceding year. However, consumption is expected to more than recover in the ’23-’24 crop year registering a new record high.

Grain consumption, fueled by demand, is largely a function of population growth and rising incomes. Consider that both corn and soybeans are primarily used throughout the world as feed for livestock, i.e. animals, which in turn are consumed by humans for protein. Consider too that animal protein is expensive relative to other food, such as bread. As such, we expect demand for corn and soybeans to increase along with the demand for animal protein spurred by rising global incomes. This is precisely what is taking place. More people (population growth) means more demand for just about everything, while increasing incomes means more demand for animal protein and therefore animal feed (corn and soybeans).

Wheat consumption has increased 70% since 1983, however per person wheat consumption has remained relatively flat, down approximately - 1%. That stands in stark contrast to soybean consumption which has more than tripled. What's more, per person soybean consumption is up 150% in 40 years. Similarly, corn consumption has more than doubled and per person corn consumption is up 70% over 40 years. More people with richer tastes suggests that global grain demand will continue to rise.

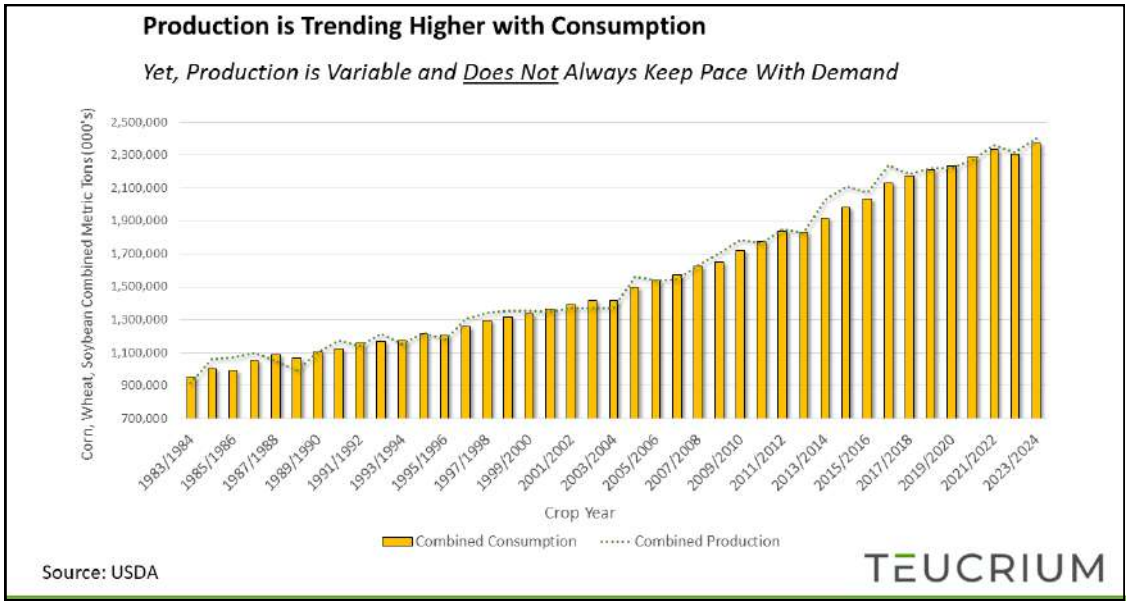
Chart #8



While global grain demand has been growing steadily, production has been erratic. In the chart below you'll notice that in some years the green dotted line (production) dips below the top of the yellow bars (consumption). This signifies years when production lags behind consumption. In such years, existing supplies (i.e. ending stocks) are drawn down to make up for the difference. Alternatively, in years when production exceeds consumption supplies are replenished as there is a build in inventories, (a.k.a ending stocks).

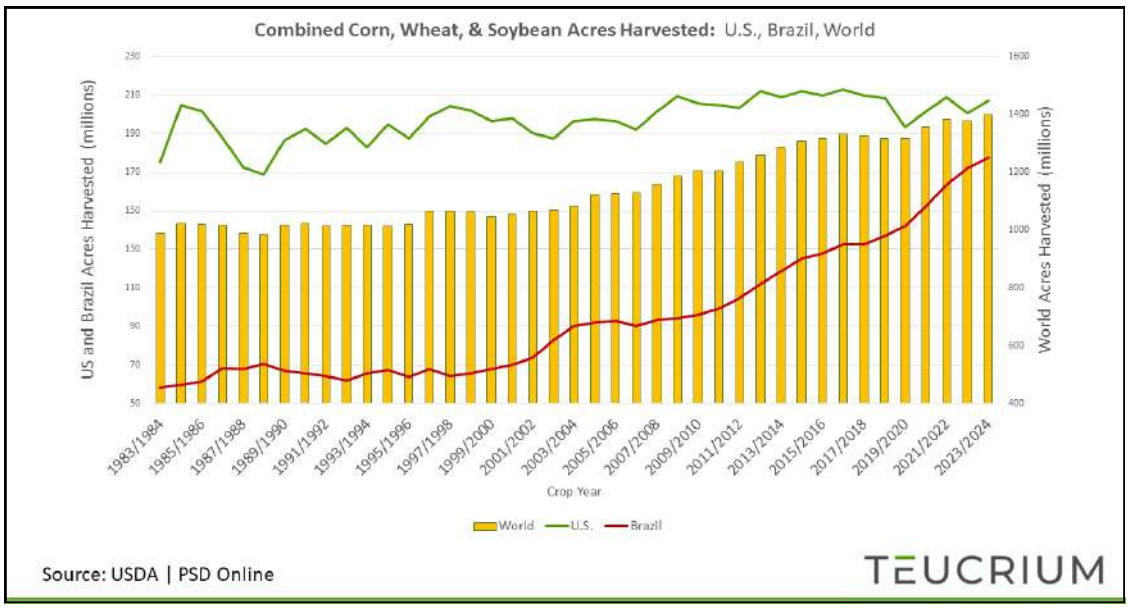
Production variability can create periods of price volatility. Still, global grain production is trending higher with consumption and has kept up over the long term. Continued production growth will depend on increased acres planted, favorable weather/climate, and technological advancements (i.e. seed, fertilizer, machinery).

Chart #9



Perhaps the most straightforward way to increase production is to plant more acres. In the U.S. it has become increasingly evident that there is little to no room to increase the number of acres planted. Consider that the U.S. harvested a record 213 million combined acres of corn, wheat, and soybeans in the 2016/2017 crop year, but has not harvested more than 210 million acres ever since. In crop year '23-'24 the U.S. is projected to harvest approximately 207 million acres. That is only 2 million acres more than what was harvested in the '84-'85 crop year. In fact, over the past 40 years, the 5-year rolling average for U.S. harvested acres has only gone up 7%. That pales in comparison to the 256% increase for Brazil over the same period.[6]

Chart #10



[6] USDA PSD Online

The U.S. represents approximately 26%, and 28% of global corn and soybean exports respectively.[7] As global demand for grains increases, the United States will need to produce higher yields to remain competitive in the global marketplace. The U.S. will certainly be a critical player in the global grain market for the foreseeable future but, with competition on the rise and the lack of new acres to harvest, U.S. farmers are likely to lose pricing power in the long term.

Trade

Wheat prices soared when Russia invaded Ukraine. At the time of the invasion Russia and Ukraine combined for approximately 30% of global wheat exports. As the shooting began there was plenty of wheat in the world. The global stocks/use ratio was approximately 34%, well above the 21st century low of 21% reached in the ’07-’08 crop year. Yet, Chicago wheat futures surpassed the ’07-’08 high of $13.345 and rose to a new all-time high of 13.40 per bushel.

Market participants were not pricing in supply concerns; they were pricing in availability concerns. War can impact supply chains and at the start of the war there was the concern that Black Sea wheat would become unavailable to world markets. At a minimum Ukraine’s trading partners had to consider the potential that they would no longer be able to depend on Ukrainian grain shipments. As the war approaches the 2-year mark, the territories currently under Russian control, including Crimea, account for about 24% of Ukraine's pre-war wheat production areas, placing the equivalent of some 166 million bushels in Russian hands.

Initial availability concerns accompanying the onset of the invasion never materialized. Russia continues to ship wheat as it normally did via the Black Sea, and Ukraine has had limited success shipping wheat through various routes, including the Black Sea, the Danube River, and via rail. But now that Russia accounts for roughly 25% of the global export market, prices are far more susceptible to the availability of Russian wheat versus Ukrainian wheat.

[7] USDA PSD Online

While war can impact global trade, peacetime politics can also disrupt markets. Tariffs and trade quotas can disrupt prices and make it harder to move food from producer to consumer. Before the outbreak of COVID-19 large cracks were emerging in the international trade arena.[8] The COVID-19 pandemic and official government responses exacerbated the issue, exposing supply chain vulnerabilities as well as cultural differences. The world has been reminded that international cooperation at times requires nations to engage as “frenemies,” that is, would-be enemies, partnering on a common objective (such as trade).

The concept of "frenemies,” especially in the context of U.S.-China trade relations, highlights the complex nature of geopolitics. During the Trump administration, the U.S. and China engaged in a trade war which negatively impacted soybeans and other markets. Yet the two nations never completely severed ties reflecting the reality of their mutual dependence. Even amid heightened competition, or even in times of conflict, nations can be compelled to cooperate on trade for mutual benefit. The U.S.-China relationship exemplifies how nations can simultaneously be adversaries and partners, navigating a delicate balance between competing interests and shared economic dependencies.

Ultimately, when it comes to food, producers have the upper hand, as no leader of any nation wants to be responsible for domestic food insecurity. That’s not to say that countries will pay any price for food; in fact, many poorer countries do often get priced out of global markets. However, there is typically plenty of corn, wheat, and soybeans available for world markets, and eventually, all grain finds a buyer. As a top 5 global producer in corn, wheat, and soybean markets, there will undoubtedly continue to be opportunities for U.S. farmers to deepen relationships with net importing countries.

Still, the geopolitical tensions underpinning the world today risk further disrupting supply chains and trade agreements. All must recognize the increased potential for further division in a *tik-tok*, sound bite world where there is no room for nuanced debate. Collectively, mankind has forgotten how to give one another the benefit of the doubt. We’ve forgotten how to approach each other as neighbors. We focus on our differences, rather than our common humanity. As such, nations and individuals alike face political pressure to identify as either pro-West or pro-Russia, pro-Israel, or pro-Palestine, etc. Ideological and religious disputes have a history of destabilizing the world and toppling markets, rulers and nations alike.

[8]Recall the U.S. “Trade-War” with China

Given the vast interdependencies of the global economy, the stakes are higher now than they ever have been. Consider that the combined global grain trade has grown more than 200% in the past 40 years. Between 1983 and 2003, global grain exports grew by only 27%. Between 2003 and 2023 the global grain export market grew more than 140%![9] It's critical to recognize that both producers and consumers suffer when supply chains break. Importers (consumers) rely on food imports to meet their needs. Exporters (producers) depend on the revenue from selling their crops. Trade benefits both the buyers and the sellers. Prosperity relies on cooperation.

The bottom line is that the geopolitical situation lends a significant amount of uncertainty to supply chain logistics and the governing trade agreements that provide for international cooperation. In financial markets, uncertainty commands a price premium.

Finally, a discussion about supply chain resilience would be incomplete without mentioning weather-related risks. Agricultural production is of course weather-dependent. One poor growing season can significantly impact the amount of food available for export.

[9]USDA PSD Online

WEATHER

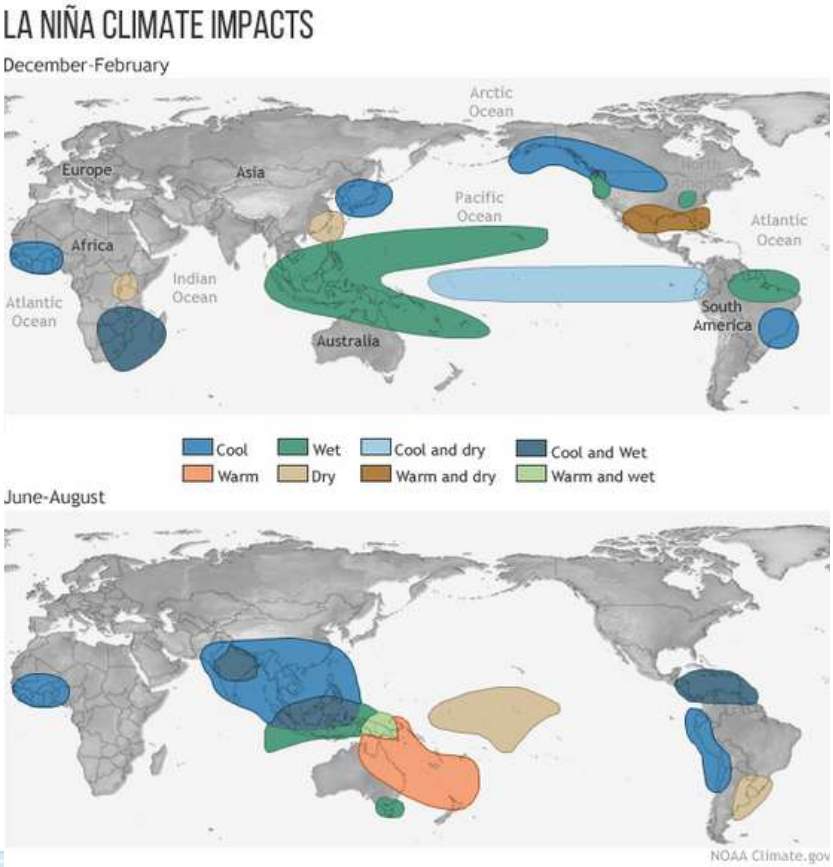
The Climate Effect

Agricultural production is intrinsically tied to weather. While short-term weather forecasting presents considerable challenges, climate pattern analysis offers a more reliable means of predicting conditions. Pertaining to agriculture, understanding climate patterns such as La Niña and El Niño is critical as these anomalies can have a dramatic effect on crop production.[9]

Following three consecutive years of La Niña, Earth has swiftly transitioned into an El Niño phase.

The recent La Niña event brought drought conditions to Argentina and southern Brazil, adversely impacting corn and soybean production.

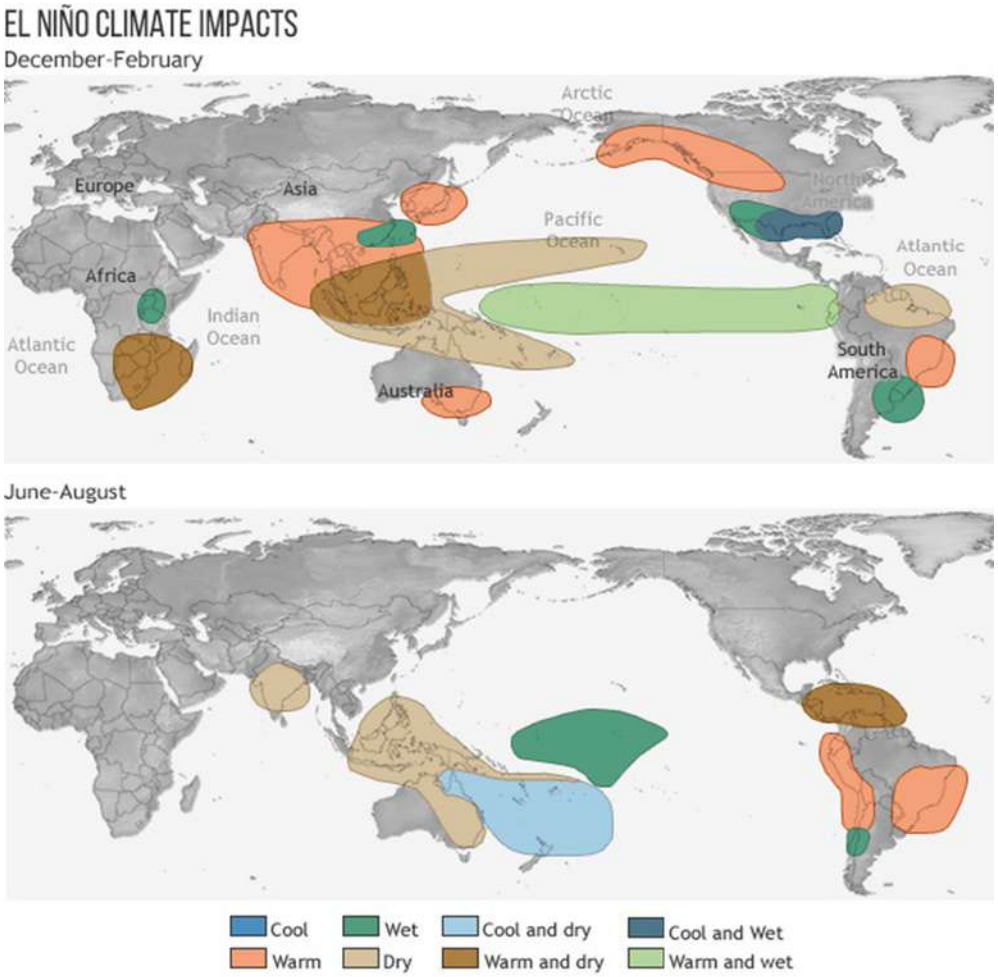
Argentinian soybean production was hardest hit experiencing a year over year decline of 43% between the '21-'22, and '22-'23 crop years.[10]



[9] El Niño is a climate pattern characterized by unusually warm ocean temperatures in the Equatorial Pacific, while La Niña is characterized by unusually cold ocean temperatures in the same region. El Niño and La Niña are anomalies because they deviate from the Pacific's normal ocean temperature patterns. El Niño leads to global weather disruptions like increased rainfall and warmer temperatures in some areas, while La Niña causes opposite effects like cooler temperatures and drier conditions in various regions
[10] USDA PSD Online

Southern Brazil's big hit came in the '21-'22 crop year, with final soybean production trailing initial USDA estimates by 10%. In contrast, central and northern Brazil experienced favorable conditions, with production in areas of Mato Grosso, a major agricultural state, helping to offset losses in the South. As we enter the El Niño phase marked by unusually warm Pacific Ocean temperatures, the global agricultural landscape faces a different set of challenges.

El Niño typically induces hotter, drier conditions in some Northern and Central regions of Brazil, posing risks of wildfires and drought, while increasing rainfall in the South can potentially lead to floods. In fact, the southern region has experienced excessive rains, while central and northern areas face drought, affecting soybean and corn planting. These conditions are likely to lead to uneven rainfall and dryness across key states, potentially causing yield losses. Moreover, planting delays for soybeans may impact the subsequent safrinha[11] corn crop, crucial for Brazil's agricultural economy.



[11] The "safrinha" corn crop refers to the second corn crop planted and harvested within the same year in Brazil, typically after the soybean harvest. This practice allows for more efficient use of land and resources, as it takes advantage of the remaining soil moisture and nutrients following the main agricultural season. The safrinha crop is usually planted in late summer and harvested in the winter, and it has become increasingly important for Brazil's total corn production.

The forecasted below-average rainfall in central and northern Brazil, coupled with above-average rainfall in the Center-South, presents a mixed picture for soybean and corn production, highlighting the complexity and regional variability of El Niño's impact on the country.

El Niño's global impacts extend beyond the corn and soybean markets. For example, Chinese wheat production is believed to be suffering from El Niño related weather impacts. Heavy rains have reduced the quality of the wheat harvest in China's major growing regions, leading to an increase in the use of domestic wheat for animal feed. This situation is expected to boost China's wheat imports, as the loss of high-quality domestic wheat could increase demand for food-grade wheat sourced from imports. This situation has prompted Chinese buyers to actively inquire about importing more grain, notably from the Americas, including the U.S.

What's more, El Niño's influence extends to sugarcane, a crop highly sensitive to water availability. Excessive rainfall can lead to waterlogging and disease outbreaks, while drought conditions result in reduced yields. Such impacts are currently being felt in Thailand and India, major sugar-producing nations. Weather-related production issues underpinned a rally in sugar prices over much of 2023. However, year-over-year gains in Brazilian cane sugar production are largely expected to offset the losses in Thailand. Additionally, as commodities traders know all too well, high prices are often a cure for high prices. In simple terms, demand tends to retreat as prices rise. The USDA's recently released World Markets and Trade report included downward revisions to consumption estimates. As such, sugar prices have recently come down from 52-week highs.

Yet, weather can disrupt more than just crop production. For example, drought can lead to low water levels in key rivers. Whether it's the Mississippi here in the United States or the Amazon in Brazil, low water levels have led to reduced cargoes and higher shipping costs.

In conclusion, the shift from La Niña to El Niño exemplifies the profound influence of climatic patterns on global agriculture. While La Niña's cooler temperatures posed challenges for South American corn and soybean production, the warmer El Niño phase brings a different set of challenges and opportunities for crops like wheat, sugarcane, and soybeans. Understanding these impacts is crucial for agricultural planning, global food security, and economic stability throughout the world.

CURRENCIES

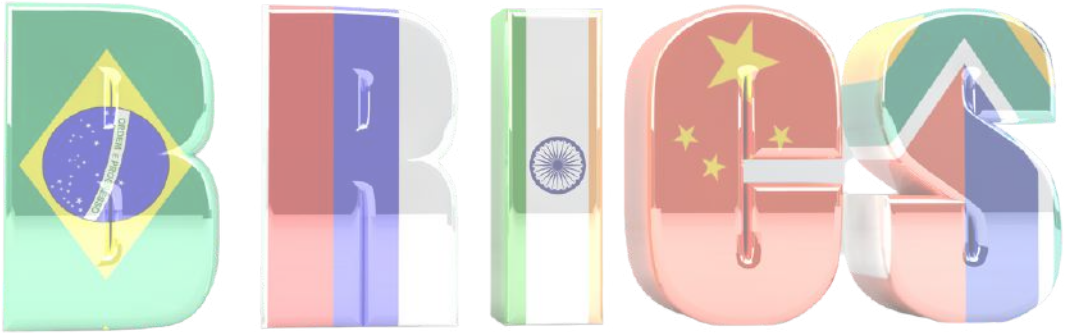
The Almighty Dollar

The term "almighty dollar" reflects the U.S. dollar's dominance in global finance. This status stems from the U.S.'s robust economy, political stability, and the dollar's role as the world's primary reserve currency.

However, the U.S. dollar's "almighty" status faces multiple challenges. The U.S. economy is under pressure. Few, if any, would describe the U.S. political condition as stable. What's more the weaponization of the dollar and the increasing use of economic sanctions (for example removing Russia from the SWIFT payments system in response to the invasion of Ukraine) have incentivized nations hostile to Western ideals to seek an alternative international currency system.

If the world gradually moves away from a dollar-based system, initial evidence will appear in the treasury market, characterized by measured selling of U.S. debt. This selling would initially boost dollar demand as treasuries are exchanged for dollars. However, for a successful transition away from the dollar, these dollars must be converted into other currencies, ultimately decreasing dollar demand. Lower demand suggests a weaker USD.

The strength of a country's currency is largely tied to the strength of its economy. Unfortunately, the sugar high from the bottom-up COVID stimulus effort is wearing off. U.S. households are holding record levels of debt, and the labor force participation rate has failed to reclaim pre-pandemic levels. U.S. consumers will soon likely feel the pinch.



As goes the U.S. consumer, so goes the economy. In this scenario, the potential exists for a dovish Federal Reserve interest rate pivot, which would present additional headwinds for the Dollar.

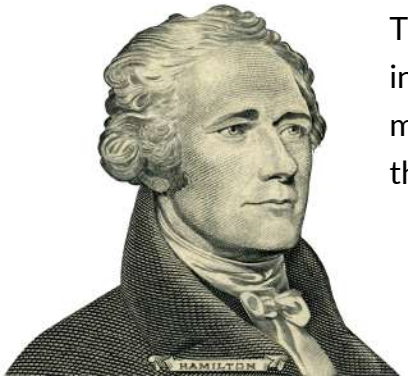
Furthermore, 2024 is an election year. Perhaps we will see the country rally around a unifying candidate, one that restores hope and pride in all Americans. However, that seems to be a long shot. Instead, we are likely to experience more of the same. That is, power-hungry self-interested parties and candidates attempting to profit by fanning the flames of discontent; combined with the meddling of hostile nations as they wage an influence campaign, sow the seeds of resentment and seek to create deeper division.

The potential loss of the U.S. dollar's status as a global reserve currency could have profound impacts on American society, a topic that extends beyond the scope of this discussion. On the brighter side, a depreciating U.S. dollar is fundamentally advantageous for American exports. As the dollar's value declines against other currencies, U.S. products become more competitively priced internationally.

It's important to note that the U.S. dollar losing its global reserve status is not an immediate concern, but rather a longer-term possibility more likely to play out in the 2030s versus the 2020s. Nevertheless, as demand for the dollar diminishes over the years, the effects will initially manifest as minor disturbances, eventually growing into significant shifts in the global economic landscape.

Near-Term: Trend Under Pressure?

Near-term U.S. Dollar strength largely depends on central bank policy divergence. The Federal Reserve (Fed) is closer to the end of the rate hiking cycle and perhaps is already finished. That suggests that the next move in rates could be lower. Japan, however, is largely expected to continue hiking rates through 2024.



This is notable given that the U.S. Dollar Index holds a 13.6% weighting in the Japanese Yen. The largest weighting however is the Euro. Overall market expectations suggest that the European Central Bank (ECB), like the U.S., is also nearing the end of its rate hiking cycle.

Importantly, signs of a global economic slowdown are emerging. Take for example JPMorgan's global composite PMI index is hovering around 50 as of November (a reading above 50 suggests positive economic growth, a number under 50 suggests an economic contraction). As a global economic contraction materializes, which we fully expect, policy responses will likely be staggered. Some countries may move faster to cut rates or undertake stimulus efforts. The discrepancy in response rates and magnitudes will create opportunities for currency traders.

Chart #11

dollar Index (DXY)- Past Performance does not guarantee future results. This chart is for informational purposes only and is not indicative of an investment in any Teucrium fund.

A global economic slowdown occurring in the next 12 months would likely be supportive for the Dollar amid a flight to "quality." However, should the U.S. lead the way into recession we would expect near-term dollar weakness.

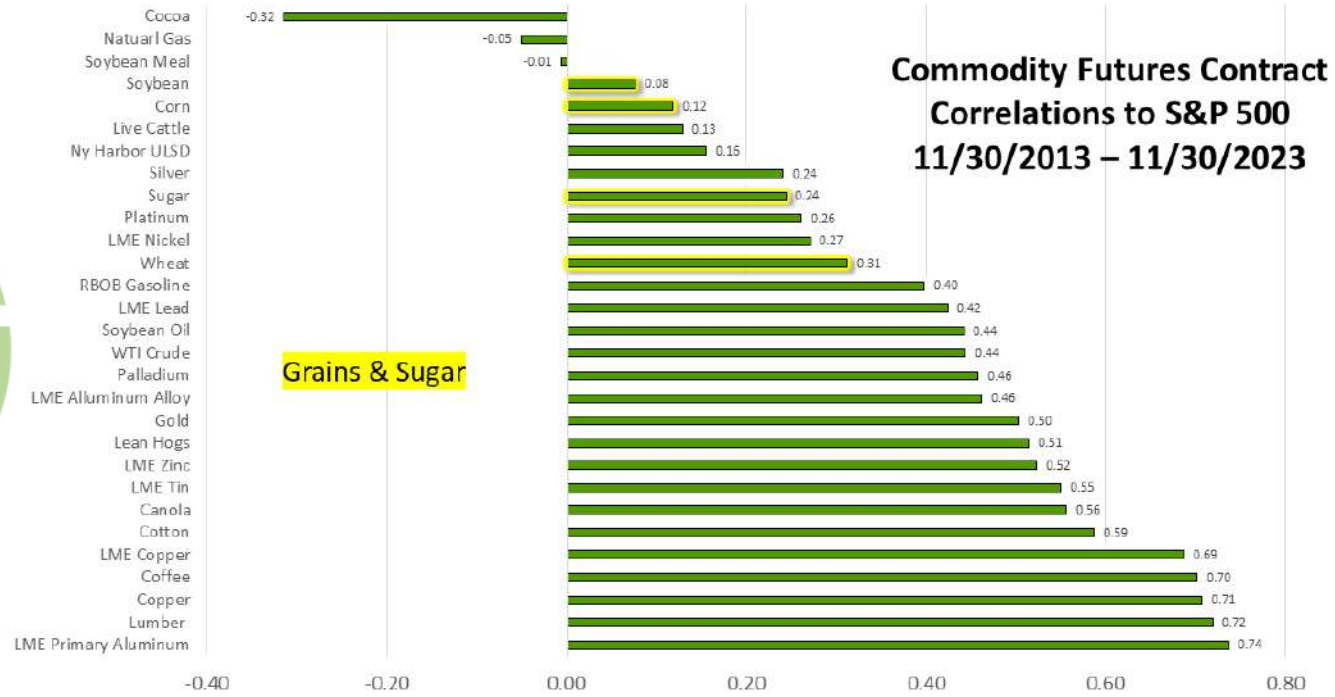
Yet, as we write this it's clear that the Dollar Index remains in an uptrend that began in 2021. Market participants will continue to watch for any break of trendline support (green dotted line below) and more importantly price support around the key $100 level. A break below $100 would suggest additional downside for the Dollar Index, and would likely be seen as a fundamentally bullish development for commodity prices in general.

AGRICULTURE

In Your Portfolio

Agricultural commodities historically have low correlations to equities versus many other commodities and most notably gold (Chart 12). Low correlations have the potential to improve portfolio outcomes during periods of stock market volatility.

Chart #12



Source: Bloomberg Finance L.P.

TEUCRIUM

Note: Commodity futures contract values are from (generic first) spot continuation indexes. See the Appendix for additional details. S&P 500 Index from Bloomberg: SPX Index. An investment cannot be made directly in an index. Past performance does not guarantee future results. This chart is for informational purposes and is not indicative of an investment in any Teucrium Fund.

Chart #13

Ag Performance During Corrections and Bear Markets			
Date	S&P 500	Teucrium	Agricultural Fund Index vs. S&P 500
	Total Return	Agricultural Fund Index	Relative Performance
01/03/2022-10/12/2022	-24.49	18.4	42.89%
2/19/2020 - 3/23/2020	-33.79%	-10.90%	22.89%
9/20/2018 - 12/24/2018	-19.36%	1.48%	20.84%
1/26/2018 - 2/8/2018	-10.10%	1.40%	11.50%
11/3/2015 - 2/11/2016	-12.71%	-7.89%	4.82%
5/21/2015 - 8/25/2015	-11.89%	-8.18%	3.71%

Source: Bloomberg Finance L.P and Yardeni Research | Teucrium

TEUCRIUM

Dates of corrections and bear markets from Yardeni Research. For the entire period 05/21/2015 – 10/12/2022 the S&P 500 Index had an annualized performance of 9.29% and the Teucrium Agriculture Fund Index had an annualized performance of 2.01%. The performance data quoted represents actual past performance. Teucrium Agricultural Fund Index Inception Date 03/28/2012.Past performance does not guarantee future results. This chart is for informational purposes and is not indicative of an investment in any Teucrium Fund. One cannot invest directly in an index.

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In fact, the Teucrium Agricultural Fund Index has outperformed the S&P 500 Total Return Index in 6 out of the last 6 stock market corrections of 10% or more (Chart 13).The latest example came after stocks reached all-time highs in early 2022. The ensuing bear market extended into mid-October, during which time the Teucrium Agricultural Fund Index outperformed the S&P 500 Total Return Index by more than 42%. Note too that even during the initial COVID sell-off in March of 2020 we saw the S&P 500 fall nearly 35% peak to trough through March, while at the same time the Teucrium Agricultural Fund Index only declined by 10.9%. That resulted in a relative outperformance of approximately 23%.

The historical tendency for grain prices to outperform equity prices during stock market corrections suggests that investors may benefit from a long allocation to agriculture precisely when it matters most; i.e. during significant stock market declines.

Ag for Beta*

Given the low historical correlations and the potential diversification benefits, a strategic long-term allocation to agriculture may make sense for investors. What's more, given what we know about the Golden Grain Cycle (see above), the period in which prices are trading at or near their cost of production presents a natural opportunity for an investor to consider building an allocation.

A long-only allocation means that returns are going to be dictated by the price action of the underlying. As we know corn, wheat, soybean and sugar prices can move sideways for an extended period, and of course there is always is downside risk. That said, the Teucrium Agricultural Fund Index is down roughly 20% from the 2022 highs. Given our base-case view that prices will continue to experience pressure in 2024 before entering a new sideways trend to trade at, or around the cost of production, we expect that 2024 will see long-term-oriented allocators building positions in agriculture as a beta play for the potential portfolio diversification benefits.

Ag for Alpha**

Agricultural futures markets have a reputation of being volatile and considerably risky (especially when compared to traditional stock and bond markets). The volatility stems from the daily engagement between buyers and sellers trading at various prices throughout the day on the endless voyage of price discovery. Volatility presents both a challenge and an opportunity.

As an investor, the challenge is to be more right than wrong. Volatility swings both ways and prices can quickly change direction. Volatility also provides opportunity. Investors have an opportunity to potentially profit from being on the right side of the market.

Since 2010 Teucrium has provided ETF investors with long-only futures price exposure to agricultural markets. For example, an investor believing that corn prices are heading higher may choose to invest in the Teucrium Corn Fund (ticker: CORN) in order to potentially capture the move higher. An investor in CORN is on the right side of the market so long as corn futures prices are rising. If, however, prices turn lower, the investor must sell his position or risk losing money.

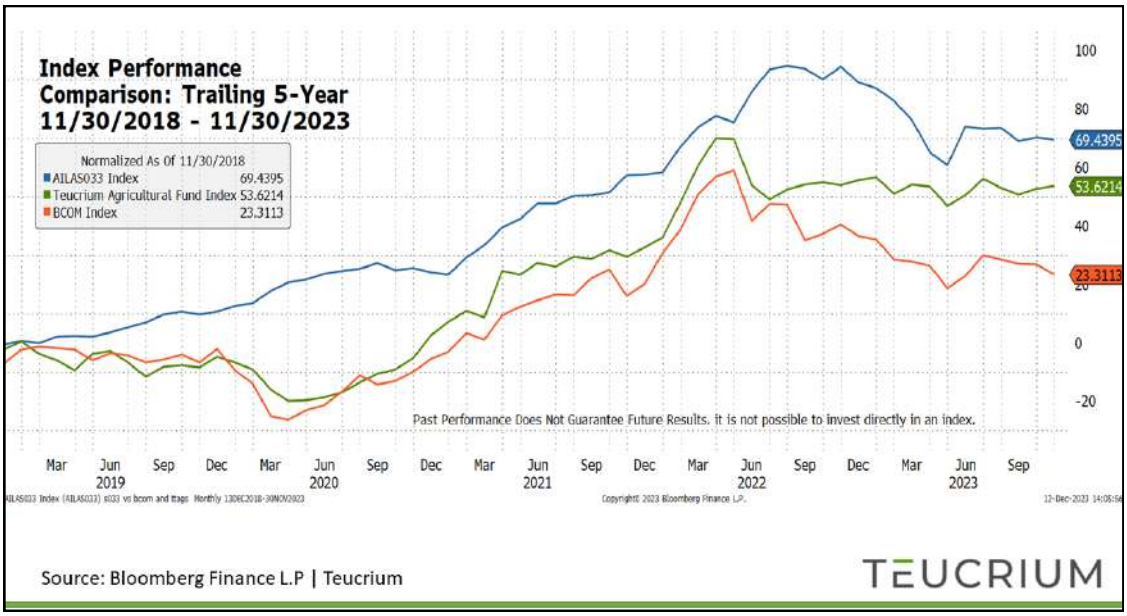
**Beta measures an investment's volatility relative to the overall market; a higher beta indicates greater risk and potential for higher returns or losses.*
***Alpha represents the excess returns of an investment compared to a benchmark index, indicating the value added by a portfolio manager's investment strategy*

Furthermore, an investor who does not currently own CORN, but believes that corn futures prices are heading lower, would not have a way to express that view outside of trading options, or selling CORN shares short if so permitted by his broker.

Alternatively, an investor seeking to diversify long-only commodity holdings by strategically allocating to agriculture may also desire a long-short strategy; especially given the volatile nature of the agricultural markets. For this reason, we partnered with index provider AiLA to launch the Teucrium AiLA Long-Short Agricultural Strategy ETF, NYSE/Arca ticker: OAIA. As the name implies, OAIA can take both long and short positions in agricultural futures markets. OAIA seeks to track the total return performance, before fees and expenses, of the AiLA-S033 Market Neutral Absolute Return Index.

While the ETF celebrates its 1-year anniversary on December 20th, the AiLA S033 Index has a live, public track record dating back to 2017. Importantly, it is not possible to invest directly in an index, however our goal in managing OAIA as mentioned, is to track the total return performance before fees and expenses of the S033 index. While past performance does not guarantee future results, the rolling 5-year performance is compelling.

Chart #14



For Illustration Purposes Only. Not Indicative of an Investment in any Teucrium Fund. It is not possible to invest directly in an index. The Teucrium Agricultural Fund Index (TTAGS) is included to illustrate the performance of a long-only agriculture index over the same periods. Additionally, BCOM (the Bloomberg Commodity Index) is included for quick comparison to a multi-commodity index.

BASE METALS

In Focus

This is the first year in which we are providing an outlook for base metals. We believe this space will offer an abundance of opportunities for traders and investors in the coming years. The world is increasingly dependent on base metals which are pervasive across the global economy. Base metal demand is expected to grow as emerging economies industrialize, and developed nations go green. Overall, the intermediate price outlook is bullish, as production of key metals such as copper is not expected to keep pace with demand as private industry strives to meet public policy goals. Near-term, however, in particular over the next 12 months, the outlook is a bit murky as a possible global economic slowdown threatens to weigh on demand.

What follows is a basic introduction to the base metal markets. We'll briefly touch on base metal uses before examining current conditions and then presenting our near-term and longer-term outlook. Finally, we'll revisit portfolio management focusing on how you might thoughtfully integrate specific strategies in hopes of delivering better outcomes in your investment portfolio by including commodities

A Dependent World

Exploring Each Metal and It's Primary Application

Aluminum, nickel, copper, tin, lead, and zinc each have prominent uses across the global economy.

Aluminum

Aluminum, celebrated for its strength-to-weight ratio, is vital in the transportation industry. Using aluminum enhances fuel efficiency and is used in all sorts of vehicles ranging from cars to spacecraft. Additionally, aluminum's malleability lends itself to architectural applications. In construction, it is used in window frames, roofing, and various structural components as it is favored for its durability, lightness, and resistance to corrosion.

As a conductor, aluminum is a cost-effective alternative to copper and is used in electrical wiring and transmission lines. Aluminum's electrical and thermal conductivities make it popular in the production of photovoltaics (think solar panels).[12]

In consumer electronics like laptops and smartphones, it's essential for heat conduction and aesthetics. In the food industry, aluminum foil is crucial for packaging, protecting contents from light, gases, and moisture, while aluminum cans are chosen for their recyclability and lightness.

Additionally, aluminum's thermal conductivity makes it ideal for cookware, and its aesthetic qualities are appreciated in various building materials such as ventilation tubing and decorative elements. This wide range of applications across multiple sectors underscores aluminum's significance in sustainable and efficient resource management.

Nickel

Nickel, a versatile and durable metal, is predominantly used to create stainless steel and various other alloys. Nickel significantly strengthens alloys and provides resistance to corrosion along with the ability to withstand extreme temperatures. Nickel's role in alloy production is crucial, particularly in the manufacture of ferronickel, which is a key component in high-quality stainless steel. This makes nickel an indispensable element in industries requiring durable and corrosion-resistant materials, such as construction, automotive, and kitchenware.

Thanks to its conductive properties and stability, nickel is used in the production of wires, batteries, and various rechargeable power sources.

Overall, nickel's diverse applications across different sectors underscore its critical role in modern industry and technology.

[12] https://www.intechopen.com/chapters/41052

Copper

Copper is a highly versatile and conductive metal extensively used in numerous industries. In construction, it's a preferred material for roofing and plumbing due to its durability and corrosion resistance. Its excellent electrical conductivity makes it indispensable for power generation and transmission where it's use in wiring and electrical equipment helps ensure efficient energy flow. Copper plays a vital role in the manufacturing of electronic products where it's used in circuit boards, wiring, and various electronic components, contributing to the functionality and reliability of devices.

In the transportation sector copper is used in various components of vehicles, including wiring and motors, improving energy efficiency and reliability. Beyond these industrial applications, copper's malleability and pleasing aesthetic make it a popular choice for plumbing fixtures and musical instruments.

The warm tones and unique sound qualities of copper-based instruments, like brass and wind instruments, are particularly valued in the music industry. Overall, copper's multifaceted applications, ranging from construction and power to electronics and arts, illustrate its essential role in modern infrastructure and technology.

Tin

Tin, a soft, malleable metal with a low melting point is primarily used to create solder. Solder is a fusible metal alloy used to create a permanent bond between metal workpieces. It is typically applied in a molten state and forms a strong, conductive, and durable joint upon cooling. Solder is commonly used in electronics for connecting wires and components (think electronics) as well as in plumbing, metalwork, and other applications where a secure and conductive joint is required.

Additionally, tin combined with copper creates the alloy bronze. Bronze's resistance to corrosion makes it an attractive alloy in the marine industry.

Demand for bronze is demand for tin.

Lead

Lead, a heavy and malleable metal, is most commonly used in manufacturing batteries. Battery production accounts for approximately 86% of global lead demand.[13] Additionally, lead's durability and ease of use make it ideal for the manufacture of plumbing materials, pipes, solders, and ammunition. Various other products, including protective coatings and certain types of seals, also rely on lead for their manufacturing. Despite its versatility, the use of lead is regulated in many applications due to health concerns.

Zinc

Zinc, recognized for its ability to prevent corrosion, is extensively used in galvanizing, a process where thin layers of zinc are applied to iron or steel. A protective coating of zinc significantly extends the lifespan of metal structures by preventing rust, making it a standard practice in the construction and manufacturing of various metal products.[14]

Beyond galvanizing, zinc's role as an alloying agent is equally important. When combined with copper, it forms brass, an alloy known for its strength and aesthetic appeal, commonly used in musical instruments, decorative items, and fittings. Zinc is also alloyed with other metals to create materials with specific properties suitable for use in automobiles, enhancing durability and corrosion resistance.[15]

[13]https://www.statista.com/statistics/891778/distribution-of-global-lead-consumption-by-end-use/
[14] https://natural-resources.canada.ca/our-natural-resources/minerals-mining/minerals-metals-facts/zinc-facts/20534
[15]https://www.visualcapitalist.com/sp/understanding-zincs-role-in-a-low-carbon-economy/

Near-Term Supply and Demand

As we write this commentary, all base metal prices, except for copper, are in the red. The story for 2023 seems to be one of fragile economic growth resulting in lackluster demand amid increasing supply. To the extent global economic conditions remain lackluster, or further deteriorate, we can likely expect much the same for 2024.

While the general outlook suggests further pricing pressure next year, not all metals markets will be equally affected. For example, the global aluminum balance sheet remains relatively tight with the market teetering on the edge of some near-term shortages. The demand is largely seen coming from photovoltaics (think solar panels) and other green-energy sector sourcing.[16]

Likewise, the copper markets appear to be teetering on the edge of an imbalance with the potential for a small supply gap over the course of 2024.[17] This however largely depends on Chinese demand, as well as global demand for EVs (electric vehicles) and the infrastructure projects required to support EVs.[18]

On the other hand, the nickel, zinc, and lead markets are all facing surpluses. Importantly, all three of these markets are expected to experience increased demand in 2024. Yet production is largely expected to exceed consumption estimates.[19] As such, if demand does not meet expectations, then nickel, zinc, and lead prices would likely face additional downward pressure.

In summary, copper and aluminum markets are expected to face shortages or a balanced supply/demand situation leaning towards shortages, which could drive prices up. In contrast, lead, nickel, and zinc are likely to experience surplus conditions, potentially leading to inventory build-ups and downward pressure on prices.

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[1]6 https://news.metal.com/newscontent/102499573/ubs-base-metals-outlook-2024-copper-will-see-a-supply-deficit-aluminum-prices-will-be-higher-later-in-2024-lead-and-zinc-will-be-in-small-surplus
[17] Ibid.
[18] https://news.metal.com/newscontent/102499787/smm-review-and-outlook-of-copper-and-aluminum-market-in-2023-2024
[19] https://news.metal.com/newscontent/102499573/ubs-base-metals-outlook-2024-copper-will-see-a-supply-deficit-aluminum-prices-will-be-higher-later-in-2024-lead-and-zinc-will-be-in-small-surplusy/

Beyond 2024
Transistioning to a "Green" Economy

The global shift toward a net-zero economy will continue to drive demand for metals. Renewable energy technologies and EVs rely heavily on base metals. Metals such as copper, nickel, and aluminum are vital for renewable energy infrastructure.[20]

Meeting the growing demand is shaping up to be a big challenge. For instance, a nearly 4.7 million-ton deficit is anticipated in the copper market by 2030.[21] Meeting demand for green battery technology necessitates substantial investments in mining and metal production, estimated at around $1.7 trillion over the next 15 years.[22] These investments are crucial for the development of new mines and the expansion of existing operations, a process often hindered by long lead times due to regulatory and environmental considerations.

Ironically, it takes a lot of energy to transition to a green economy. Mining is energy-intensive and largely reliant on fossil fuels. As such, metal mining is widely considered to be a "dirty" business.

Additionally, establishing a new mining site often requires some form of government approval or permitting. Local governments typically want to understand the ecological impacts due to land degradation before signing off on a new project.[23] In many cases, a mining company is one of, if not the single largest employer, in a geographic area, which can mean increased scrutiny of labor practices and working conditions.[24]

Complying with environmental, zoning, and labor regulations often leads to production delays, and/or increasing production costs.[25]

[20] https://www.mckinsey.com/industries/metals-and-mining/our-insights/the-raw-materials-challenge-how-the-metals-and-mining-sector-will-be-at-the-core-of-enabling-the-energy-transition
[21] https://www.ey.com/en_us/mining-metals/critical-minFederals-supply-and-demand-issues
[22] Ibid. Costs include investments relating to lithium mining as well.
[23]https://earth.org/environmental-problems-caused-by-mining/
[24] https://www.iisd.org/system/files/2021-10/still-one-earth-sustainable-mining.pdf
[25]https://news.mongabay.com/2023/11/very-good-progress-but-nothing-firm-as-deep-sea-mining-rules-are-hashed-out/

Geopolitics

Commodity market participants know all too well that geopolitical uncertainty results in a risk premium being built into prices. Base metals markets are inherently susceptible to geopolitical risks given their geographical concentration.

For instance, Chile and Peru are major producers of copper, while aluminum production is largely concentrated in China and Russia. Nickel supply and production are concentrated in Indonesia and the Philippines. Changes in any one country's export policies or mining regulations can significantly impact global supply dynamics.

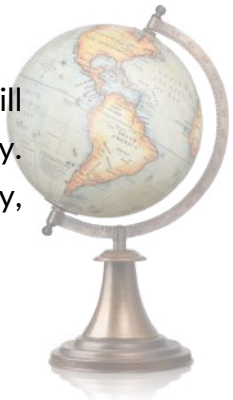
Countries are responding to these challenges by attempting to diversify their supply chains, exploring new trade agreements, and increasing domestic reserves (i.e. stockpiling).

The U.S. and Japan, for example, recently entered into an agreement aimed at strengthening supply chains for essential metals required to produce batteries for EVs.[1] The agreement is largely designed to reduce the two countries' dependence on China for critical minerals.[2]

China, meanwhile, has built up vast reserves of copper, aluminum, and zinc in effort to mitigate the effects of market volatility and support manufacturing sectors.[3]

Still, commodities are finite, and one nation's success in safeguarding supply can come at the expense of another. This creates a security paradox whereby one country's efforts to secure its own supply can be perceived as a threat by other nations which only inflames tensions further.

The United States, given its reliance on foreign sources for essential raw materials, will inevitably need to confront this paradox while transitioning to a "green" economy. Consequently, market participants are poised to encounter heightened uncertainty, potentially leading to increased market volatility.



[1] https://www.mining-technology.com/news/us-japan-critical-minFederals-trade/?cf-view
[2] Ibid.
[3] https://www.reuters.com/world/china/what-china-keeps-its-secretive-commodity-reserves-2021-08-05/

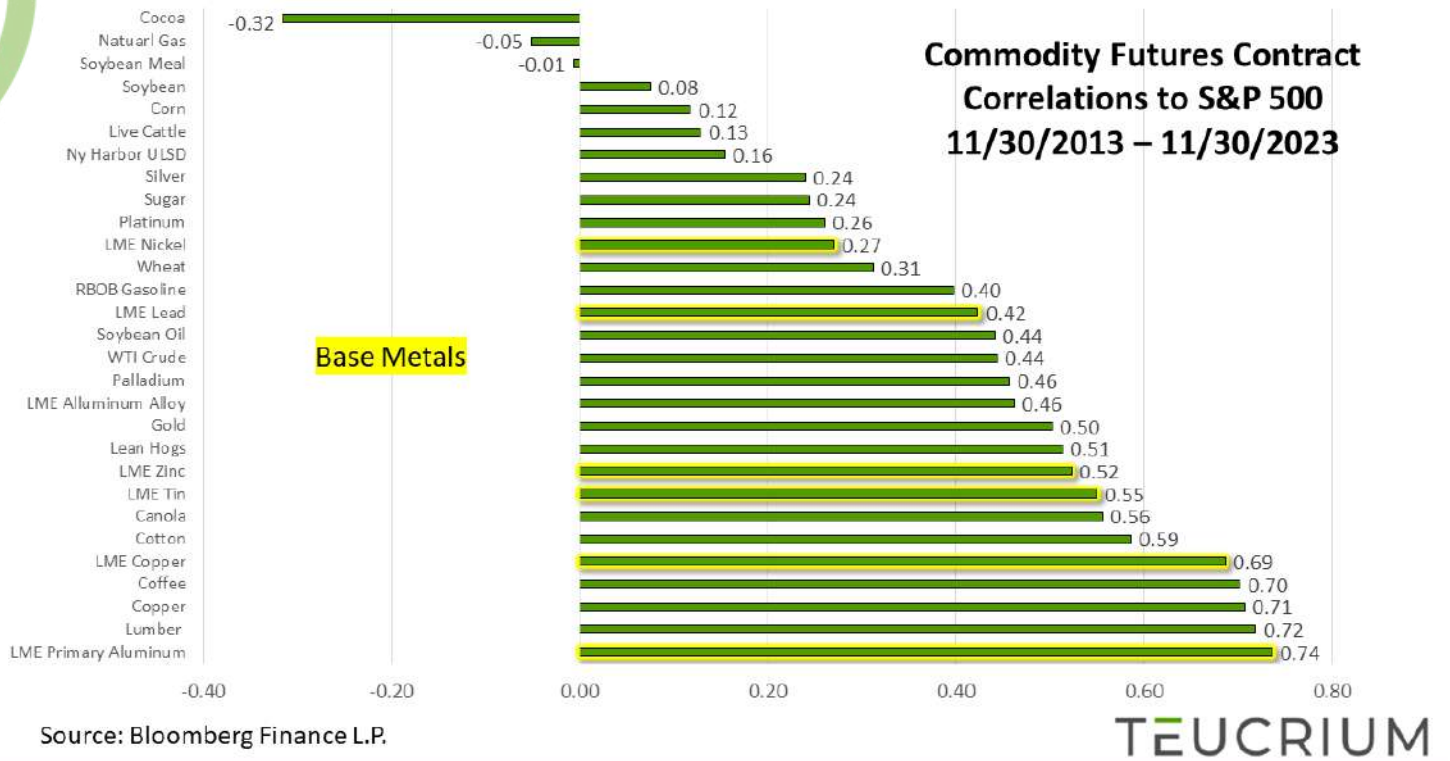
BASE METALS

In Your Portfolio

The most common question we receive from investors and financial advisors has to do with portfolio positioning. Investors want to know how base metals fit in their portfolio. The answer depends on the individual investor's approach to investing and portfolio construction.

Tactical traders will likely look to gain exposure through single commodity funds in hopes of capitalizing on the volatility associated with a specific market. On the other hand, strategic allocators may seek out a diversified fund to capture the potential diversification benefits associated with an asset class that, on the whole, has relatively low correlations to equities.

Chart #15



Note: Commodity futures contract values are from (generic first) spot continuation indexes. See Appendix for additional details. S&P 500 Index from Bloomberg: SPX Index. An investment cannot be made directly in an index.Past performance does not guarantee future results. This chart is for informational purposes and is not indicative of an investment in any Teucrium Fund.

Still, like all commodities, base metal prices are volatile. There are times when prices are trending higher, times when prices trend lower, and periods when prices move sideways. Those seeking to potentially capitalize on price volatility may be most interested in a strategy with the ability to go both long and short futures contracts. Sophisticated traders with access to futures trading accounts may endeavor to execute a long/short strategy themselves. Those seeking exposure to a long/short base metals strategy in a brokerage account can consider the **Teucrium AiLA Long-Short Base Metals Strategy ETF, ticker: OAIB.**

Chart #16

For Illustration Purposes Only. Not Indicative of an Investment in any Teucrium Fund. It is not possible to invest directly in an index. The Teucrium Agricultural Fund Index (TTAGS) is included to illustrate the performance of a long-only agriculture index over the same periods. Additionally, BCOM (the Bloomberg Commodity Index) is included for quick comparison to a multi-commodity index.

As the name implies, OAIB can take both long and short positions in base metals futures markets. OAIB seeks to track the total return performance, before fees and expenses, of the AiLA-S022 Market Neutral Absolute Return Index.

The AiLA-S022 Index has a live, public track record dating back to 2017. Importantly, it is not possible to invest directly in an index, however our goal in managing OAIB as mentioned, is to track the total return performance before fees and expenses of the S022 index. While past performance does not guarantee future results, the rolling 5-year performance is, compelling.

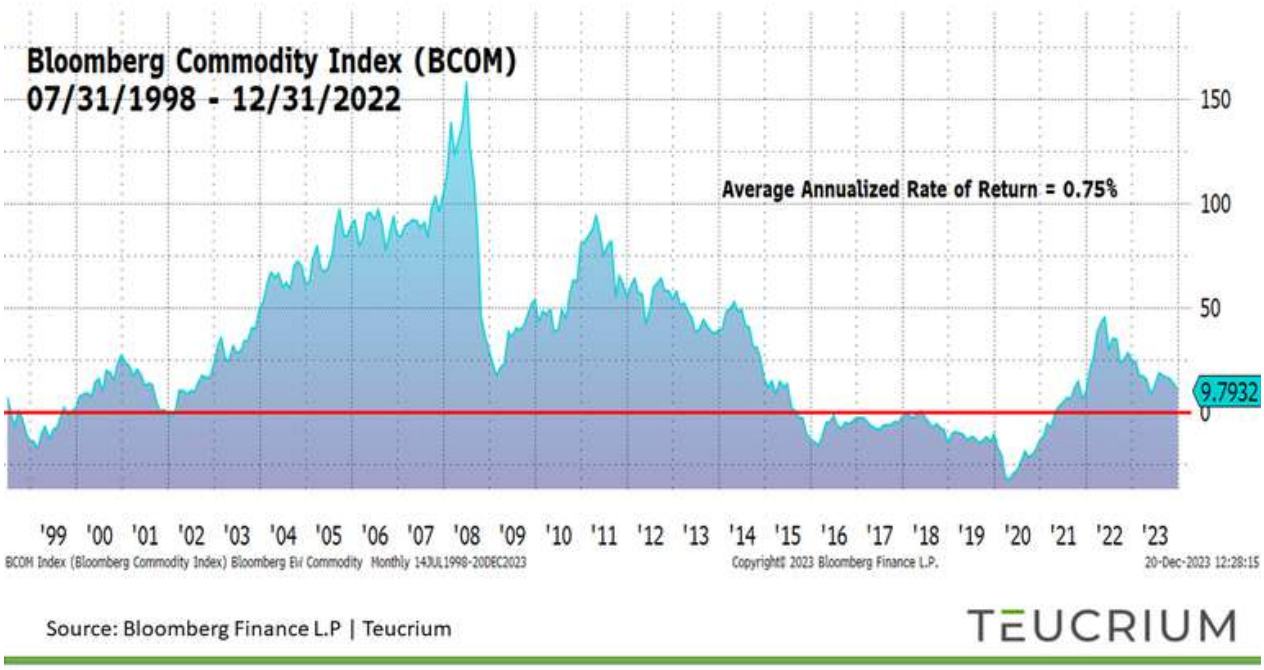
SEEKING BETTER OUTCOMES

In Commodities

As discussed above, Commodities typically have low correlations to traditional asset classes making them an appealing option for those seeking to build more resilient diversified portfolios. Most recently we have witnessed the benefits of diversification play out in calendar year 2022. Both stocks and bonds were down that year, while the Bloomberg commodity index was up 13%.

This is an example of diversification working when you need it most. In 2022 long only exposure to a broad-based commodity fund worked. However, taking a wider perspective, over the nearly 25 years since BCOM's inception, through the calendar year 2022, we see that the Bloomberg commodity index returned, on average, an annualized .75% per year.* Over the same time frame, the S&P 500 Total Return Index averaged a 6.92% rate of return. BCOM had a standard deviation of around 17% compared to approximately 13 for the S&P 500 Total Return Index. The risk-adjusted rate of return in this instance clearly favors stocks.

Chart #17



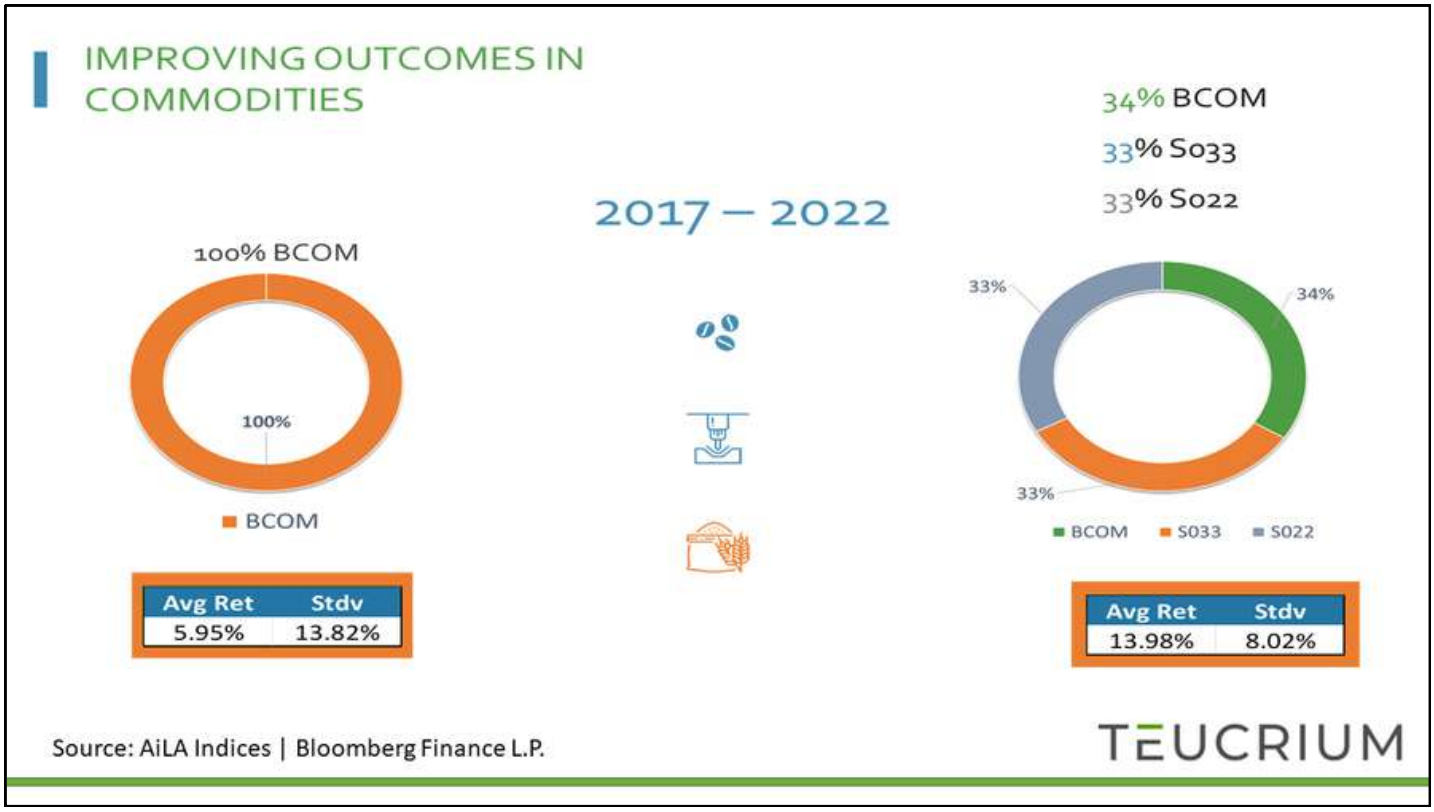
Note: Index performance for the Bloomberg Commodity Index (BCOM). S&P 500 Index from Bloomberg: SPX Index. An investment cannot be made directly in an index. Past performance does not guarantee future results. This chart is for informational purposes and is not indicative of an investment in any Teucrium Fund.

Taking a long-term strategic position in commodities can result in relatively dead weight in your portfolio. The underwhelming long-term performance of broad diversified long-only commodity indexes is unfortunate as it tends to create a stigma around the asset class. However, we believe there is a better way to position commodities in a portfolio. It involves maintaining long-only, broad exposure (for the potential diversification benefits) while incorporating long/short alpha strategies which offer the potential to generate positive returns regardless of underlying price trends.

We recently conducted a study using the index benchmarks behind the Teucrium AiLA Long-Short Agriculture Strategy ETF (OAIA), and the Teucrium AiLA Long-Short Base Metals ETF (OAIB). The AiLA index names are S033, and S022 respectively. The indexes have a published track record going back to 2017. The track record represents actual index performance and is not a backtest.

We set out to compare BCOM's risk-adjusted returns to a strategy roughly equal weight to the AiLA S033 Index (33%), the AiLA S022 Index (33%), and BCOM (34%). What we discovered was that between the years 2017 and 2022, the diversified strategy vastly outperformed (8%+) the 100% BCOM allocation, with significantly less risk (standard deviation of 8% vs. 13.8%).

Chart #18



While history does not guarantee future results, the study suggests that there are ways to potentially improve the risk-adjusted returns for the commodities portion of an investment portfolio.

The beta component of the strategy, i.e. long long-only position, is there for years like 2022 when diversification matters most and potential benefits of holding assets with low correlations are realized. The alpha component of the strategy, i.e. the long-short positions, are there for times when commodity prices are moving sideways, or trending lower. **We believe that this approach creates a compelling case for commodities to be a permanent allocation in a well-diversified portfolio.**

Conclusion

A permanent allocation to hard assets will likely make sense for many investors looking out to 2024 and beyond. The economic prosperity realized in the wake of the global pandemic, fueled by bottom-up stimulus policies, reignited the perils of inflation that the world hasn't seen in nearly four decades. 2024 may be a make-or-break year in the war against inflation. There are signs that policymakers are close to winning the war, but risks remain.

A continued decline, or at least a flatlining of food prices would take additional wind out of the inflation sail. As described above we believe grain prices will face continued downward pressure before stabilizing to trade at or around the cost of production at some point in 2024. Additionally, we are facing the potential for a global economic slowdown and what we believe will be, at best, a soft recession in the United States as consumers run out of firepower and are forced to face the record debt amassed over the last few years by both consumers and the U.S. Government.

With or without a global economic slowdown, the possibility of increased inflation and higher commodity prices will always remain, due to ongoing threats of potential supply disruptions. These may be caused by production issues, like weather impacting agriculture, or geopolitical conflicts, including wars and trade disputes. At a minimum, we believe geopolitical fragmentation will underpin commodity prices for the foreseeable future.

As we race into 2024 global markets are facing a long list of risks and challenges. But that is not unique to 2024. Every year comes with risks and challenges. But, most importantly, every year comes with *opportunity*.

Stay sharp. Do your research. “Nullius in Verba.”

Have a joyous and prosperous New Year.

Appendix

Front Month Futures Index	Bloomberg Code
NY Harbor ULSD	H01 Comdty
LME Nickel	LN1 Comdty
Natural Gas	NG1 Comdty
Soybean Meal	SM1 Comdty
Corn	C 1 Comdty
Soybeans	S 1 Comdty
Soybean Oil	B01 Comdty
Platinum	PL1 Comdty
Brent Crude	CO1 Comdty
M WTI Crude	CL1 Comdty
Sugar	SB1 Comdty
Cocoa	CC1 Comdty
Silver	SI1 Comdty
Wheat	W 1 Comdty
Gold	GC1 Corndty
LME Lead	LL1 Comdty
Palladium	PA1 Comdty
Copper	HG1 Comdty
LME Primary Aluminium	LA1 Comdty
LME Zinc	LX1 Comdty
Cotton	CT1 Comdty
Coffee	KC1 Comdty
LME Tin	LT1 Comdty

Disclosure

Investing involves risk. Principal loss is possible. Diversification does not ensure a profit or protect against loss.

Investors should consider the investment objectives, risks, charges, and expenses carefully before investing. For a prospectus with this and other information about the Teucrium E[CB1] TFs, please call 802-540-0019 or visit www.teucrium.com. Please read the prospectus carefully before investing.

This material is not an offer or solicitation of any kind to buy or sell any securities outside of the United States of America.

The Teucrium Exchange Traded Commodity Funds' prospectus is available here www.teucrium.com.

CORN, CANE, SOYB, WEAT, and TAGS are commodity pools regulated by the Commodity Futures Trading Commission (CFTC). These Funds, which are ETPs, are not mutual funds or any other type of Investment Company within the meaning of the Investment Company Act of 1940, as amended, and are not subject to regulation thereunder. The funds do not track the spot price of corn, sugar, soybeans or wheat.

OAIA, OAIB & TILL are "non-diversified" investment companies under the Investment Company Act of 1940, as amended and, therefore, may invest a greater percentage of their assets in a particular security than a diversified fund. OAIA, OAIB & TILL are commodity pools regulated by the CFTC. OAIA, OAIB & TILL are new and have limited operating history.

OAIA & OAIB short selling involves the sale of commodities. The short seller profits if the commodity's price declines. If a shorted commodity increases in value, a higher price must be paid to cover the short sale, resulting in a loss. The amount the Fund could lose on a short sale is theoretically unlimited.

OAIA & OAIB employ a "passive management" approach that seeks investment results that correspond (before fees and expenses) generally to the performance of its underlying index. There is no guarantee that the Fund will achieve a high degree of correlation to the underlying Index and therefore achieve its investment objective.

Disclosure Cont...

Differences in timing of trades and valuation as well as fees and expenses, may cause the fund to not exactly replicate the index known as tracking error.

Futures Risks: Commodities and futures generally are volatile and are not suitable for all investors.

Futures investing is highly speculative and involves a high degree of risk. An investor may lose all or substantially all of an investment. Investing in commodity interests subject each Fund to the risks of its related industry. These risks could result in large fluctuations in the price of a particular Fund's respective shares. Funds that focus on a single sector generally experience greater volatility.

Futures may be affected by Backwardation: a market condition in which a futures price is lower in the distant delivery months than in the near delivery months. As a result, the fund may benefit because it would be selling more expensive contracts and buying less expensive ones on an ongoing basis; and Contango: A condition in which distant delivery prices for futures exceed spot prices, often due to costs of storing and inuring the underlying commodity. Opposite of backwardation. As a result, the Fund's total return may be lower than might otherwise be the case because it would be
selling less expensive contracts and buying a more expensive one.

For further discussion of these and additional risks associated with an investment in
the Funds please read the respective Fund Prospectus before investing.

Past performance does not guarantee future results.

Distributor: Foreside Fund Services, LLC is the distributor for the Teucrium Funds.