



# Commodity Futures & Inflation Protection

## Why Commodity Futures Provide Better Inflation Protection than other Real Assets for the Return-oriented Investor



By David Greely, Ph.D,  
Economist and Investment  
Strategist, and Senior Adviser,  
Quantix Commodities

### Sources of Inflation Protection

The threat of rising inflation is leading many investors to seek ways to protect their investments from the risk of both an erosion of purchasing power and a decline in value driven by increasing yields. For a concerned investor, there are several potential sources of inflation protection, but which is best?

The answer will depend on the nature of the investor. In this note, we consider two broad types of investors: the income-oriented and the return-oriented. The income-oriented investor is primarily concerned with protecting the cash flows provided by their fixed-income investments from an erosion of purchasing power. The return-oriented investor is primarily concerned with protecting the value of their portfolio, which is typically heavily invested in equities, from a rise in yields. For both types of investors, however, we believe that the best source of inflation protection should have these important characteristics: *it should provide a clean and reliable offsetting exposure to their inflation risk, it should be low cost, and it should be liquid and transparent.*

We begin by narrowing the field of potential sources of inflation protection to Real Assets, whose cash flows tend to keep pace with inflation over time.

For each of these Real Assets we consider only implementations that are low cost, liquid, and transparent. For example, we consider US real estate investment trusts (REITs) for physical assets, rather than other more expensive, less liquid, and less transparent physical assets like timberland.

Investors typically turn to Real Assets for inflation protection because they offer cash flows that are expected to rise with inflation, and for the income-oriented investor, each can provide meaningful inflation protection. However, for the return-oriented investor, meaningful inflation protection requires that total returns rise with inflation, not just cash flows.

#### Specifically, we look at:

1. Inflation-linked bonds
2. Physical Assets
3. Commodity-related equities
4. Commodity futures

**We find that for the return-oriented investor, commodity futures provide the cleanest and most reliable form of inflation protection, commodity-related equities provide meaningful inflation protection, and inflation-linked bonds and physical assets are not reliable sources of inflation protection.**

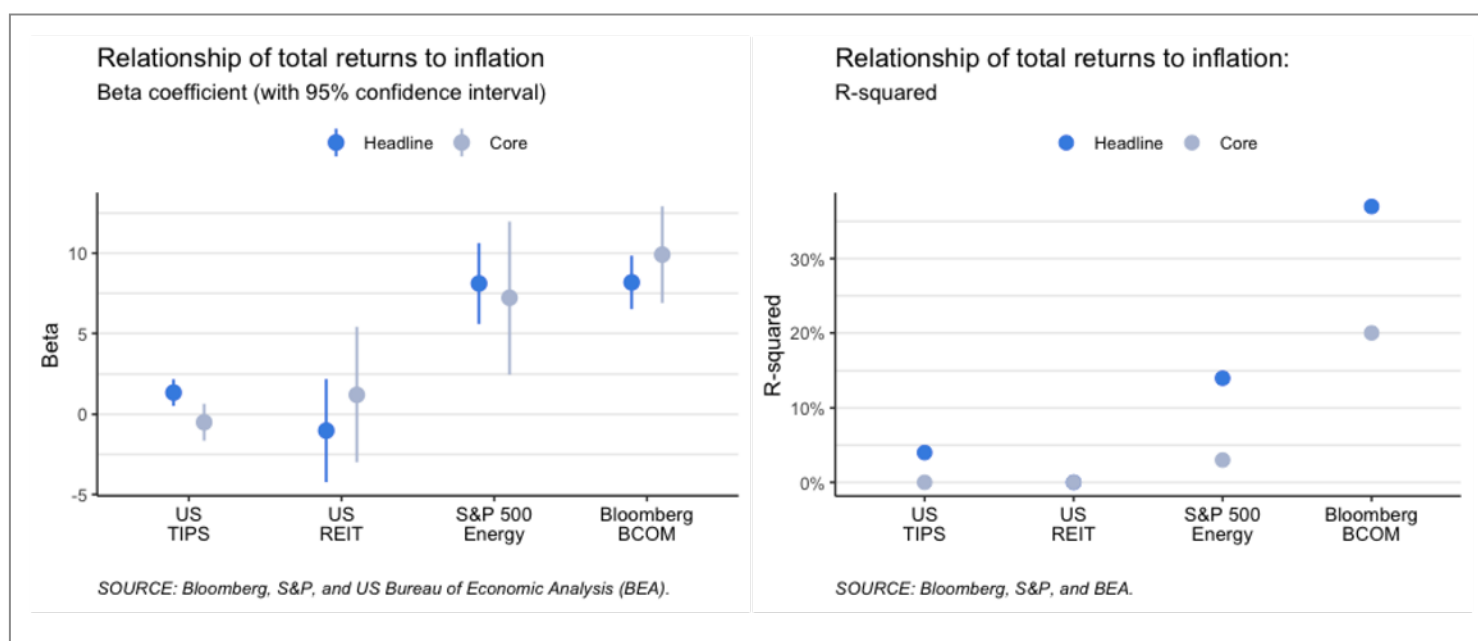


The relationship between returns and inflation will depend on the response of monetary policy to inflation. Central banks normally respond to rising inflationary pressures by tightening monetary policy, which leads to a rise not only in nominal interest rates but also in real interest rates. This rise in real yields means that the returns on a Real Asset may not rise with inflation, they may even fall. To measure the size and significance of this effect, we look at the relationship between returns and inflation for each of these Real Assets over time, both within and across monetary policy regimes. The best source of inflation protection should provide the return-oriented investor with a clean and reliable offsetting exposure to inflation both within each monetary policy regime and across different monetary policy regimes.

While these findings are based on looking at the relationship between the returns of Real Assets and inflation across monetary policy regimes over the past 50 years, they are consistent with the relationship observed during the periods of conventional monetary policy over the past 40 years, which we show in the figures below.

The Beta coefficient represents the percentage change in total returns for a given percentage change in inflation. The R-squared represents the percentage of the variation in total returns accounted for by variation in inflation. A higher R-squared means that the Real Asset is a more effective hedge against inflation.

**Figure 1:** Relationship of total returns to inflation of different Real Assets<sup>1</sup>



In summary, we find that for income-oriented investors who are primarily concerned with protecting their cash flows from

an erosion of purchasing power, all four of these types of Real Assets can provide meaningful inflation protection. However, for return-oriented investors who are primarily concerned with protecting against a decline in the value of their portfolio,

commodity futures have the best ability to hedge the inflation risk exposure of the typical equity portfolio among the Real Assets that we consider.

In short, for return-oriented investors, commodity futures are the real asset.

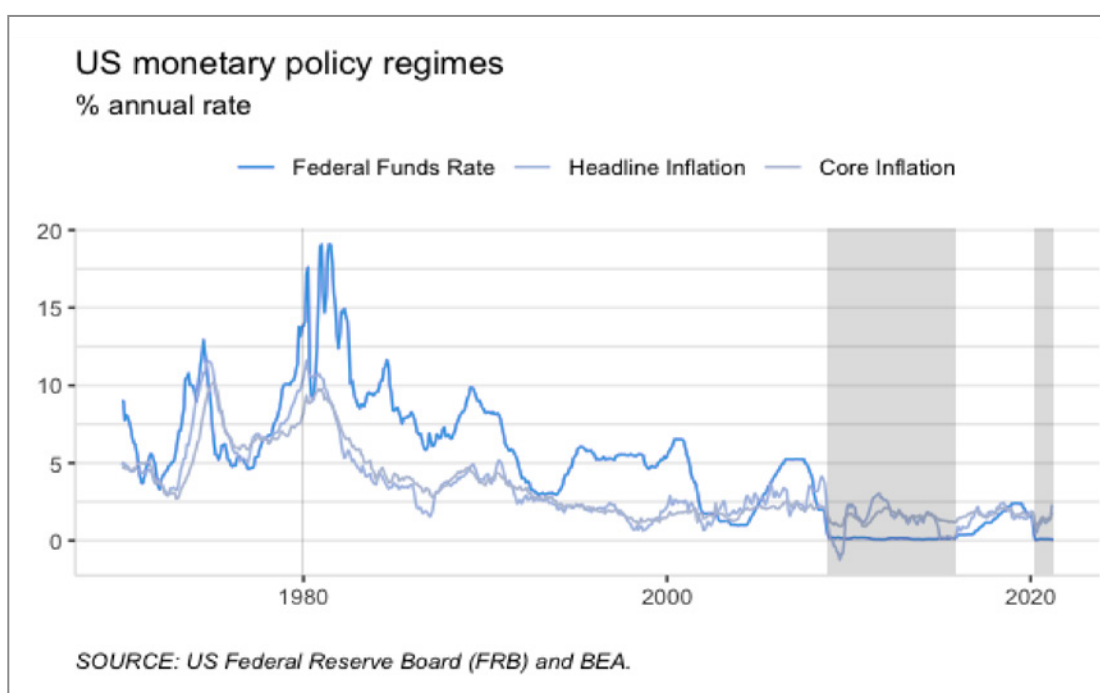
<sup>1</sup>Bloomberg Barclays US TIPS Total Return Index: March 1997 – September 2008, January 2015 – February 2020. Bloomberg US REITs Index Total Return Index: December 1993 – September 2008, January 2015 – February 2020. S&P 500 Energy Total Return Index: September 1989 – September 2008, January 2015 – February 2020. Bloomberg Commodity Index and S&P GSCI Total Return Indices: January 1980 – September 2008, January 2015 – February 2020

## Inflation & Monetary Policy Regimes Over the Past 50 Years

While most investors' experience is of the relatively low and stable rates of inflation of the last few decades, their concern about the threat of inflation is colored by the more distant memories of the Great Inflation of the 1970s. Investors want inflation protection that will be robust across different monetary regimes and inflation episodes, as well as within them. Therefore, we examine the relationship between Real Asset returns and inflation both within and across different monetary regimes.

The history of US monetary policy over the past half century can be broadly characterized as consisting of three regimes: the passive approach of the 1970s, the more active approach ushered in by Fed Chairman Paul Volcker in 1979, and the use of unconventional monetary policy tools when interest rates hit their lower bound at zero after the Global Financial Crisis in 2008 and following the onset of the Covid-19 pandemic (grey shaded areas in the figure below).

**Figure 2:** US Monetary Policy Regimes, January 1970 – March 2021



Within each monetary policy regime, we measure inflation using the Personal Consumption Expenditures (PCE) price index and we look at the relationship between total returns and inflation, both Headline and Core (excluding food and energy). Headline inflation tells us about inflation as experienced by investors and measures the erosion of the purchasing power of their cash flows. Core inflation tells us about the underlying "trend" rate of inflation, and it can provide a simple measure of inflation expectations.

This leads us to use a simple measure of "unexpected inflation": the difference between realized inflation over the past year and the rate of Core inflation one year ago. The Core-PCE price index is also important because it is the measure that the Federal Reserve watches most closely, and so a rise in Core-PCE inflation is more likely to lead to a tightening of monetary policy.

In the following sections, we examine each Real Asset in turn. We begin with inflation-linked bonds.

## Inflation-linked Bonds: US Treasury Inflation-Protected Securities (TIPS)<sup>1</sup>

Inflation-linked bonds provide a straightforward demonstration that the relationship of cash flows to inflation can be very different from that of total returns to inflation. In the case of Treasury Inflation-Protected Securities (TIPS) – the US inflation-linked bond – cash flows (both coupon and principal) are constructed to mechanically increase with CPI inflation, making them a reliable source of inflation protection for the income-oriented investor.

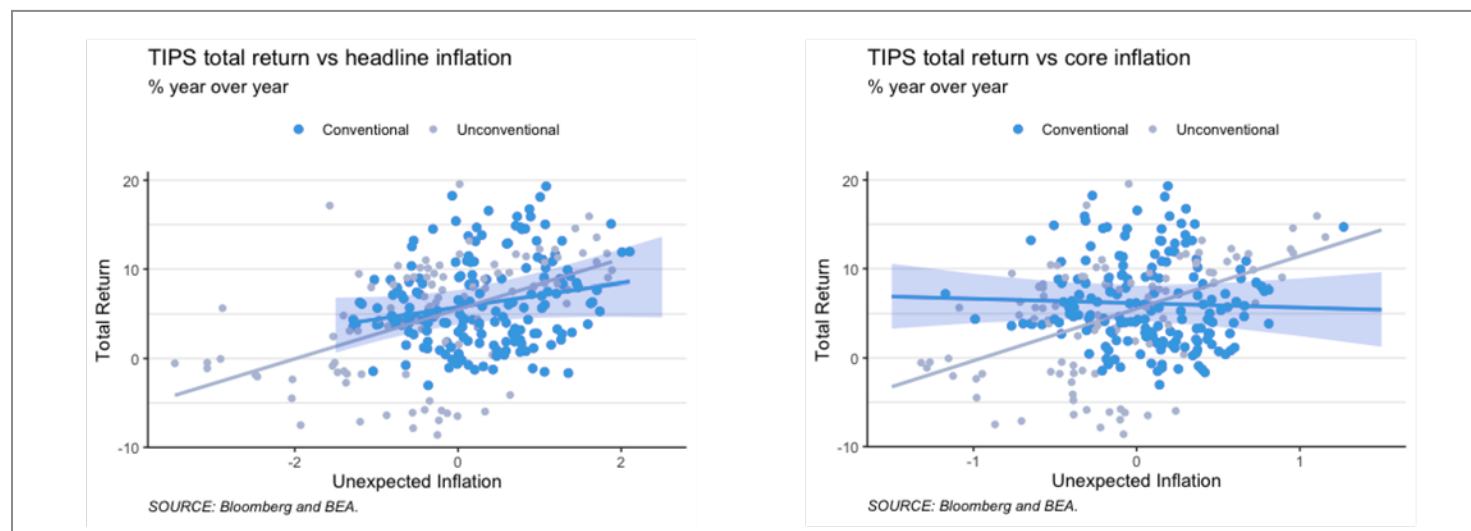
However, we expect that the response of monetary policy to inflationary pressure can (and does) transform inflation risk into real yield risk, which will put downward pressure on TIPS prices and returns during periods of rising inflation, making them an unreliable source of inflation protection for the return-oriented investor.

Because the pass-through of inflation risk into real yield risk is determined by the conduct of monetary policy and investor expectations of the conduct of monetary policy, we expect that the relationship between the returns of this Real Asset and inflation can change over time, particularly across different monetary policy regimes. Therefore, it is important to look for the stability of the relationship to inflation across monetary regimes as well as within them, which we will do now.

The track record of US TIPS is consistent with these expectations. TIPS were not created until 1997, so they do not have a track record within the Great Inflation of the 1970s. However, outside of the recent periods of unconventional monetary policy with interest rates at their zero lower bound, TIPS returns have shown only a weak relationship to Headline inflation, and a negative relationship to Core inflation.

This can be seen with the dark blue trendline on Figure 3, which is essentially flat. The shaded region shows the uncertainty around the estimate of the predicted relationship, indicating a weak relationship between returns and inflation.

**Figure 3:** TIPS total returns vs Headline and Core inflation, March 1998 – March 2021



During the recent periods of unconventional monetary policy, TIPS have shown a strong positive correlation to inflation as illustrated by the grey trendline in Figure 3. This highlights the role of real yield effects and monetary policy on TIPS effectiveness as a source of inflation protection.

In these periods the Fed has used zero interest rate policy and forward guidance in an effort to anchor expectations of nominal interest rates. With nominal yields anchored, rising inflation expectations leads to declining real yields, which would cause TIPS returns to rise with inflation, as we observe. This positive correlation is also consistent with the Fed using unconventional monetary policy tools like quantitative easing to put downward pressure on real yields in an effort to reflate the economy during these periods.

<sup>1</sup> Bloomberg Barclays US TIPS Total Return Index. Monthly data beginning in March 1997.

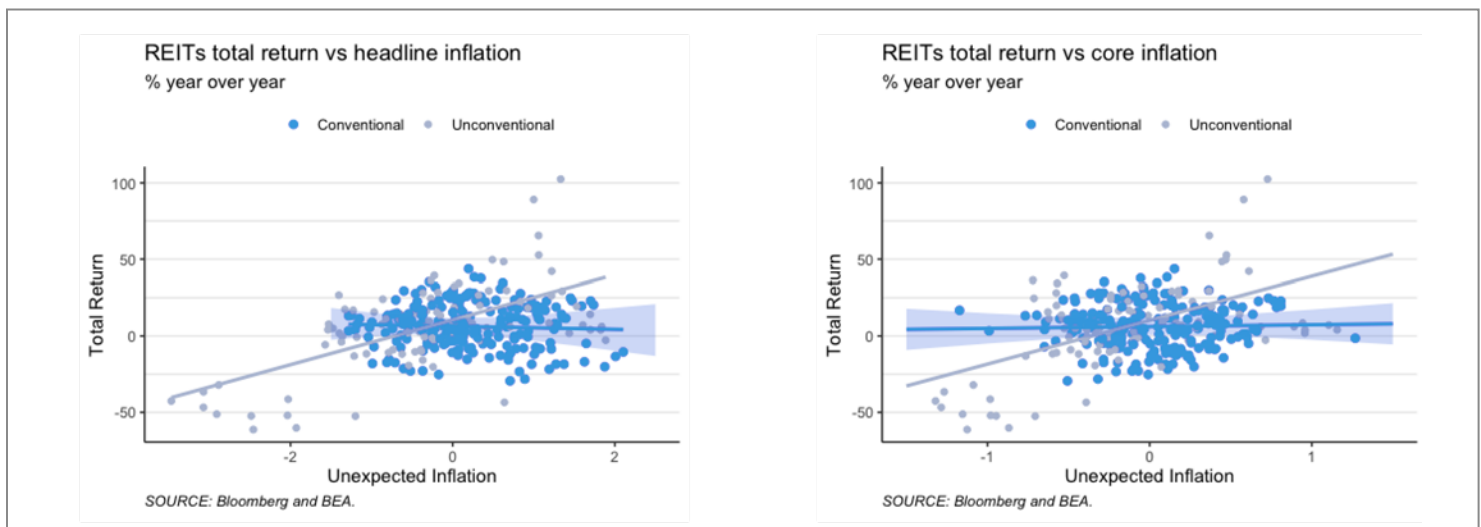
Regardless of the reason, what we see is that while the relationship between TIPS returns and inflation may be strong within a certain period of time or monetary policy regime, it has not been stable over time and across monetary policy regimes. It is therefore an unreliable source of inflation protection for the return-oriented investor.

## Physical assets: US Real Estate Investment Trusts (REITs)<sup>2</sup>

Physical assets such as US Real Estate Investment Trusts (REITs) also deliver cash flows that tend to rise with inflation, and so we expect that the relationship between their returns and inflation will be similar to that of inflation-linked bonds. However, unlike TIPS the connection between cash flows and inflation is not direct, and it could be muddled by the impact of a slowdown in economic growth (due to a tightening of monetary policy in response to the inflationary pressures) on the revenues of the physical asset.

Overall, we see a very similar pattern in the relationship between REITs returns and inflation to what we saw in TIPS. Outside of the recent periods of unconventional monetary policy, REITs returns have not risen with either Headline or Core inflation, which makes them a poor source of inflation-protection for the return-oriented investor.

**Figure 4:** REITs total returns vs Headline and Core inflation, December 1994 – March 2021



It is also worth reiterating that while REITs are a low cost, liquid, and transparent way to use a physical asset as a source of inflation protection, many of the physical assets that investors may consider are not. Many physical assets are expensive, illiquid, and not transparent. For return-oriented investors this creates the additional problem that even if their value rises during a period of rising inflation (which it does not reliably do), it will be difficult to sell or to accurately price the asset in order to offset the losses in the other parts of the portfolio.

## Commodity-Related Equities: S&P500 Energy Sector<sup>3</sup>

We would expect the cash flows of commodity-related equities to rise with inflation, along with the rise in commodity prices and that is largely the experience in energy-related equities in recent US history. Furthermore, because commodity price movements are much more volatile than movements in the overall price level, the cash flow movements may be able to more than offset the real yield effect that plagues TIPS and REITs.

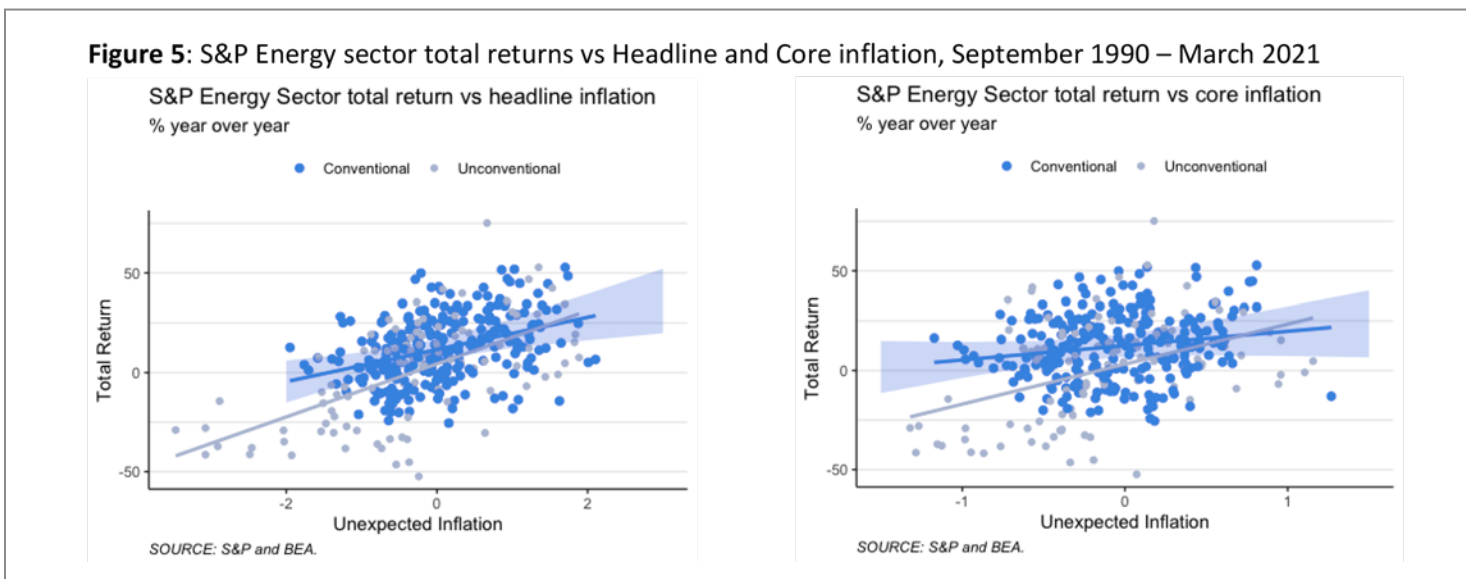
<sup>2</sup>Bloomberg US REITs Index Total Return Index. Monthly data beginning in December 1993.

<sup>3</sup>S&P 500 Energy Total Return Index. Monthly data beginning in September 1989.



As we see below, commodity-related equity returns have had a fairly consistent relationship with inflation over the past few decades.

**Figure 5:** S&P Energy sector total returns vs Headline and Core inflation, September 1990 – March 2021



To the extent that commodity-related equities can be viewed as just a claim to the revenues from a relatively certain level of commodity production, one could think of replicating them with a set of commodity futures. However, we know that a company is much more complicated than this: supply is uncertain and prone to shocks, costly investment is required to secure new production, and cost increases may squeeze margins and earnings even as commodity prices rise.

While these issues have not been important in recent decades, we can easily imagine scenarios in which earnings are hurt by declining supply volumes, rising costs, and compressed margins even as commodity prices rise. For example, commodity prices could be rising at the same time that increased environmental regulations curtail production and raise costs. Net, we expect that over time a commodity-related equity will be less reliable as a source of inflation protection than a commodity futures index.

#### Commodity Futures: Bloomberg BCOM & S&P GSCI Commodity Indices<sup>4</sup>

A commodity futures index provides exposure to a basket of commodity prices. Inflation is just a rise in the overall level of prices in the economy. We have every reason to expect that a basket of commodity prices will be reliably related to the overall basket of prices in the economy because the basket of commodity prices includes the prices of food, energy, and materials – prices whose changes flow through to all the other prices in the economy. We would therefore expect a commodity futures index to be a reliable source of inflation protection.

This close connection of commodity futures to commodity prices and therefore to the overall level of prices in the economy is crucial for avoiding the real yield risk that we see with other Real Assets. Because commodity futures give direct exposure to the commodity price, the real yield primarily affects the futures through the commodities price. This means that as long as the commodity prices remain linked to the overall price level, any real yield effect on the commodity price will also be present in the overall price level of the economy.

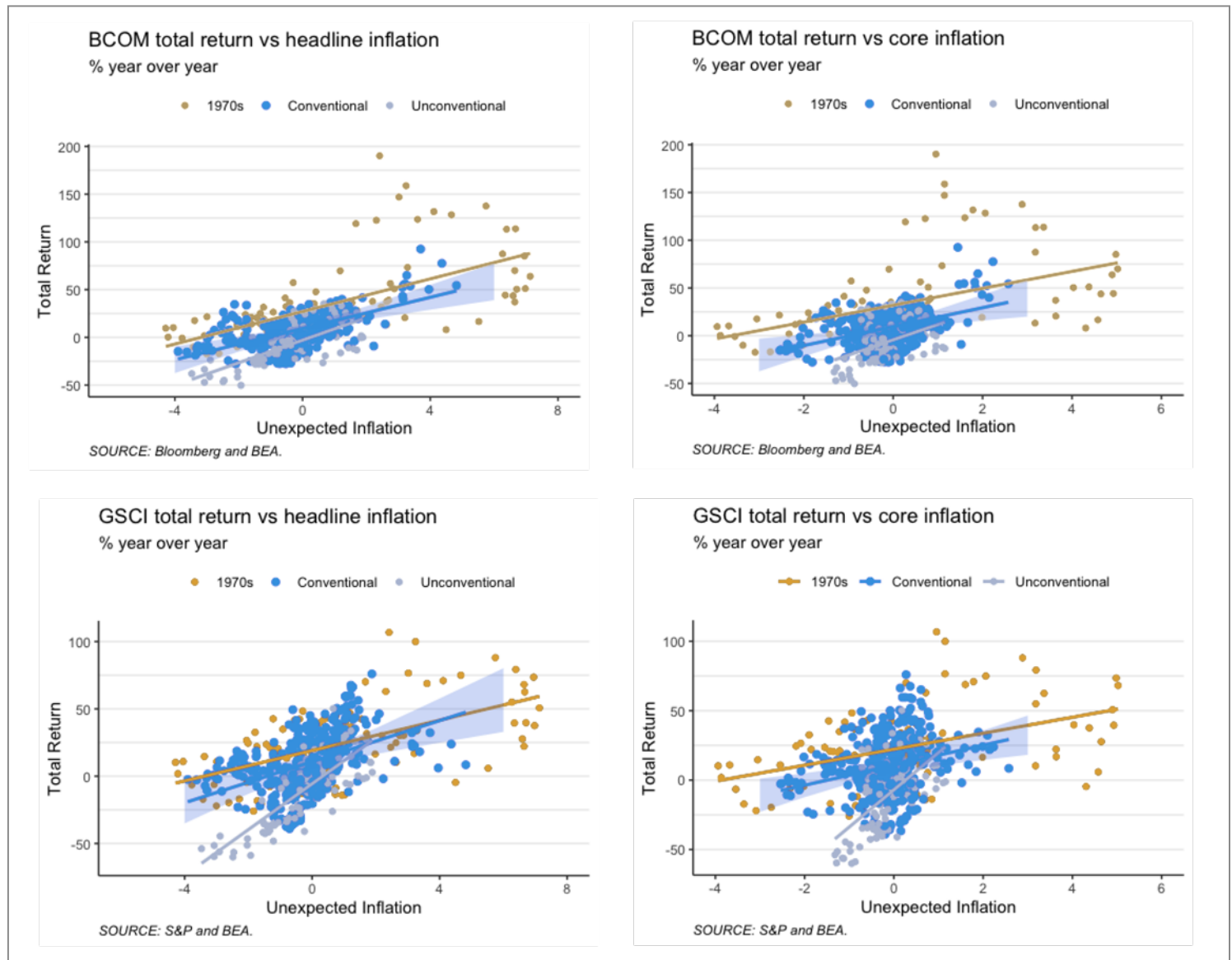
Consequently, for commodities that are central to the economy (like food, energy, and materials) the real yield effect is minimal. For a commodity that is less central, like gold, real yield effects create relative price movements that make gold behave more like TIPS in relation to inflation.

<sup>4</sup>Bloomberg Commodity Index and S&P GSCI Total Return Indices. Monthly data beginning in January 1970.

Therefore, we expect that the direct price-to-price connections between the returns of commodity futures and inflation will be cleaner and more reliable than those of other Real Assets. The track records of commodity indices are consistent with these expectations. The S&P GSCI and Bloomberg Commodity indices both have track records extending back to the Great Inflation of the 1970s (although the composition of the indices has changed, notably with the addition of energy futures in the 1980s), and both indices exhibit behavior in line with our expectations.

The first takeaway from the figures below is that the response of these two commodity futures indices to inflation, both Headline and Core, has been strong and remarkably stable across the three monetary policy regimes over the past 50 years. The trend line of total returns to inflation surprises for both indices have quite similar slopes during both the Great Inflation of the 1970s (orange) and under the conventional monetary policy that followed (dark blue). Further, commodity futures prices, much like the other Real Assets, have had even higher inflation sensitivity during the period of unconventional monetary policy at the zero lower bound on interest rates following the Global Financial Crisis in 2008 (grey line).

**Figure 6:** S&P GSCI and BCOM total returns vs Headline and Core inflation, January 1971 – March 2021





These figures show the robustness of commodity futures indices in providing a clean and reliable offsetting exposure to inflation. While these indices potentially have a low explicit cost, they can also come at a low implicit cost in terms of their expected returns because investors who are long commodity futures can also receive a risk premium.

The desire of producers to hedge in many of the commodity markets is typically larger than the desire of consumers to hedge, and so producers must pay a risk premium to get investors to take the commodity price risk that producers want to hedge. Investors can then insure against inflation through a basket of commodities futures, taking the other side of the trade from the commodity producers, and receiving a risk premium rather than paying one. That is, investors can get paid to insure themselves against inflation.

## Conclusion

Real Assets are potentially attractive sources of inflation protection because they offer cash flows that rise with inflation, providing a more stable “real” (or inflation adjusted) stream of income. For the income-oriented investor, this makes Real Assets an attractive choice, including all four types examined here.

For return-oriented investors, the key risk from inflation is that it will cause a decline in the value of their portfolio, which is typically heavily invested in equities. While commodity-related equities are a reasonable second choice, the investor already has substantial equity risk. Commodity futures demonstrate the greatest ability to hedge the inflation risk of all of the four Real Assets examined, both within different monetary regimes and across them.

For the return-oriented investors, commodities are the real asset.

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