

# Inflation, Commodities and Trend-Following

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## Abstract

Inflation levels have recently reached highs not seen in decades, causing concern amongst investors over the impact this may have on their investment returns, especially for portfolios with large exposures to equities and bonds. With traditional inflation hedges such as TIPS having an uncertain outlook, and commodities only just having experienced a strong rally, we explore trend-following as a suitable investment strategy to provide inflation protection in a more risk-controlled and consistent way.

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## 1. Introduction

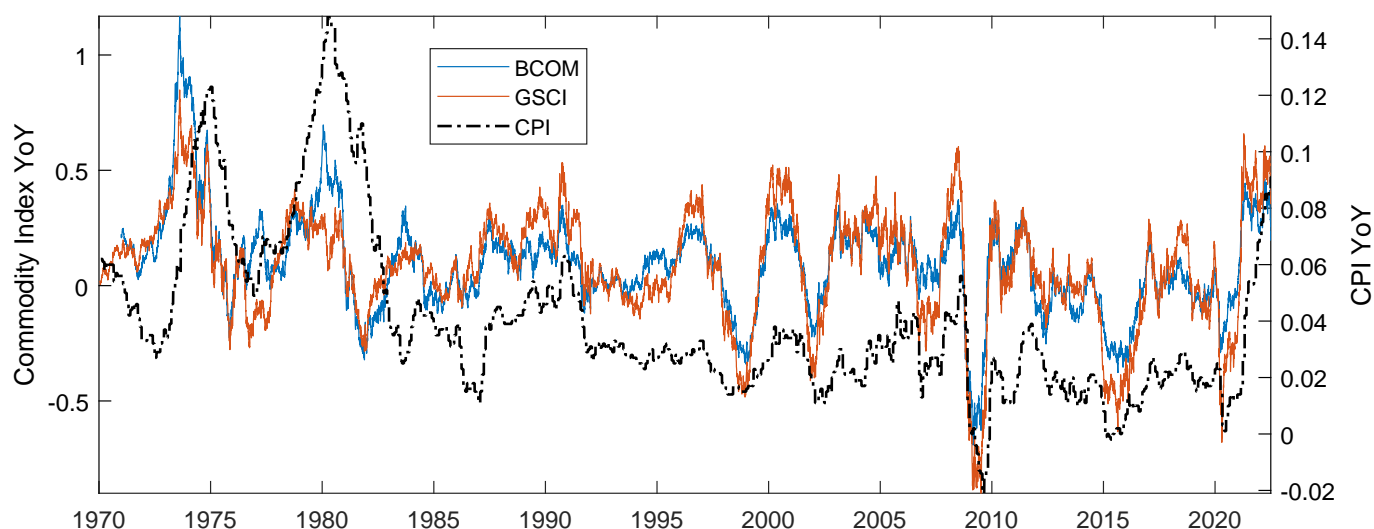
After more than a decade of low inflation, the year-on-year (YoY) CPI has recently reached levels around 9%. Inflation this high has last been observed in the 1980s, and many investors are anxious about its detrimental effect on the core of their portfolios - equities and bonds. While equities can *theoretically* be resilient in times of high inflation, the recent bear market has made it clear that high inflation and crashing stock prices can go hand in hand. Bond prices fall when yields rise, which coincides with increasing inflation, and the purchasing power of its cash coupons erodes over time, exacerbating the pressure on investors. Indeed, the correlation between equities and bonds is typically positive when inflation rises, see for example Calderini and Skilton (2021) for details, with negative returns from both equities and bonds, seemingly leaving nowhere to hide for investors. Two liquid investments that are typically used to protect against inflation are TIPS and commodities. We explore their performance next, focusing on their return profiles during periods of high inflation.

## 2. Traditional Liquid Inflation Protection

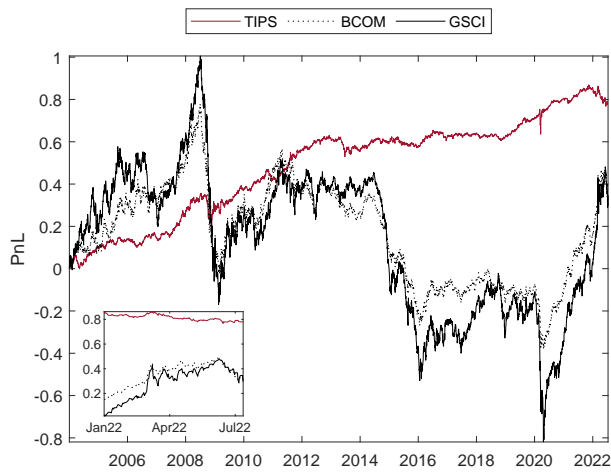
*Treasury inflation-protected securities (TIPS)* are explicitly designed to counter the effect of loss in purchasing power by adjusting the bond principal (and therefore bond coupons) according to inflation. Instead of buying individual bonds, investors can gain exposure to TIPS via ETFs (we use the iShares TIPS Bond ETF for our analysis), which track the performance of a blend of different TIPS.

*Commodities* are also often an investment choice in macro environments such as we see today because of the high historical correlation between commodity returns and inflation rates. This is illustrated by the YoY percentage change in two popular commodity indices, the Bloomberg Commodity Total Return Index (BCOM) and S&P GSCI Total Return Index, see Figure 1, whose correlation to the CPI has been at least 70% in the last decade.

Figure 2 shows the investment performance for TIPS, the BCOM and the GSCI, starting in 2004 until July 2022. Immediately apparent are the different volatilities, which is low for



**Figure 1.** Historical YoY inflation and commodity index returns for the period from March 1970 to July 2022. The graph shows data for the CPI, the Bloomberg Commodity Index (BCOM) and the S&P GSCI.



**Figure 2.** Performance for the iShares TIPS Bond ETF, the BCOM and GSCI. Annualized volatilities are about 6%, 17%, and 24%, respectively.

TIPS at around 6%, while it is high for the BCOM and GSCI, at 17% and 24%, respectively. TIPS show fairly steady performance when the entire period is considered, but have recently posted disappointing returns, just as inflation was rising and portfolio protection was needed. And while both commodity indices have had stellar returns since the spring of 2020, and more specifically the BCOM and GSCI have gained about 15% and 27%, respectively, by mid-July 2022, they also have experienced equally steep drawdowns historically and are showing signs of price pressure at the time of writing. Table 1 summarizes their performance statistics.

Asset	Return	Volatility	IR
TIPS	4.4%	6.2%	0.70
BCOM	1.6%	16.8%	0.09
GSCI	1.6%	24.0%	0.07

**Table 1.** Overall performance statistics for TIPS, BCOM and GSCI.

Asset	Return	CPI < 2.5%	Return	CPI ≥ 2.5%
TIPS		3.4%		6.2%
BCOM		-7.1%		14.0%
GSCI		-13.0%		20.1%

**Table 2.** Average YoY returns for TIPS, BCOM and GSCI in different inflationary regimes.

We also contrast the performance of TIPS, BCOM and GSCI *conditional* on the inflation regime. By filtering YoY returns according to the CPI realized over the given year, we calculate average YoY returns for ‘low’ and ‘high’ inflation periods. We set the cutoff at 2.5% here, also with a view towards trying to maintain a roughly commensurate number of sample points in each bucket. Table 2 shows the resulting average returns. We find positive performance for TIPS in both inflation regimes, with a higher return when inflation is above 2.5% as expected.

While TIPS are a straightforward way of adding inflation protection to a portfolio, they have limitations. TIPS are highly correlated with classical treasuries (the current 3-month rolling correlation to the iShares GOVT ETF is close to 70%), which in turn have not provided reliable negative beta to equity markets lately, see DeWoskin et al. (2020). In this sense TIPS are not a good diversifier to a portfolio holding equities and bonds. Furthermore, TIPS’ volatility is quite low, damping their return potential. Finally, even in these inflationary times when TIPS are designed to do better, their performance lately has been disappointing and their outlook is far from certain, see Kowara (2017) and Reken-thaler (2022). We will therefore not consider them further in the remainder of this note.

Commodity indices, notably, do indeed show very good performance when inflation is high, greatly outperforming TIPS, but post losses when inflation is low. The scale of returns is also a reflection of the larger volatility associated with commodities. This and the fact that commodities have just gone through a significant rally make timing an entry into a long commodities exposure difficult.

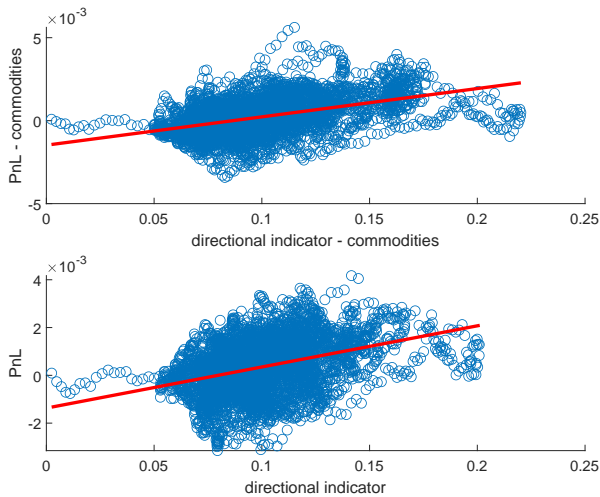
### 3. Price Trends and Trend-Following

To seek to deliver the inflation protection profile of commodities in a more downside-controlled and volatility-controlled way, we look to trend-following. Trend-following can profit from rising and falling markets as it comes with its own “built-in” risk management, latching on to price trends as they emerge, and adjusting exposure accordingly. We employ a generic moving average crossover trend-follower in our analysis. (For details and other implementations see Bethke et al. (2018), for example.) One way of quantifying the degree to which markets are trending is by calculating their *directional indicator* (DI), see Tricker and Bethke (2017). The DI effectively measures the price change in a market over a given time period in relation to the price variability over that period, resulting in large values when there are sustained directional price trends (up or down), and small values for markets that are moving sideways.

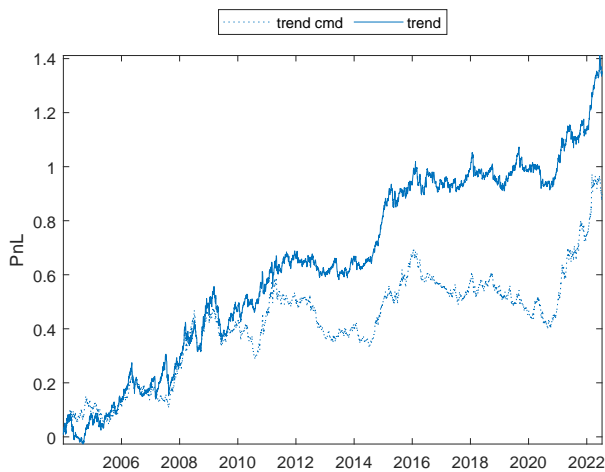
Here we consider two options, trend-following on commodities only and broader trend-following across a range of sectors including commodities and financials, to potentially benefit directly from adverse moves in financials resulting from inflation, as well as to provide greater diversification. In Figure 3 we regress PnL on the DI, finding a clear positive correlation. As we can see, both commodities and broader markets benefit similarly from the strategy.<sup>1</sup> The performance profile is also illustrated in Figure 4 (both trend strategies have a volatility of 10%).

We show overall performance statistics for our trend-followers in Table 3. We also calculate the average return during periods of low and high inflation as defined previously, see Table 4. Our simple trend-following model on commodities realizes a good return when inflation is high, outperforming BCOM and GSCI on a risk-adjusted basis, see Table 5, and avoids losses otherwise, again doing much better than BCOM and GSCI. This performance

<sup>1</sup>The scatter plot also shows that an over-extended trend (maximally large DI levels) can sometimes lead to decreased performance as markets revert. Notably, in this dataset such instances are fairly rare, with only few sample points deviating from the broad pattern.



**Figure 3.** Trend-following PnL shows a positive correlation to the level of the directional indicator (DI) for commodities and across sectors.



**Figure 4.** Gross performance for a generic trend-follower on commodities, as well as across a wide range of sectors.

Asset	Return	Volatility	IR
BCOM	1.6%	16.8%	0.09
GSCI	1.6%	24.0%	0.07
Trend C.	4.6%	10.0%	0.46
Trend	7.0%	10.0%	0.70

**Table 3.** Performance statistics for two trend-followers: trading commodities only, and trading commodities and financial markets. Included for direct comparison are the same results for commodities, shown previously in Table 1.

is realized at a controlled volatility (of 10% in our case). Allowing for the inclusion of markets from other sectors we see further improvement, with positive performance regardless of inflation regime. From an inflation protection perspective, trend-following therefore is an attractive investment choice.

Asset	Return   CPI < 2.5%	Return   CPI ≥ 2.5%
BCOM	-7.1%	14.0%
GSCI	-13.0%	20.1%
Trend C.	0.4%	10.3%
Trend	4.8%	9.9%

**Table 4.** Average YoY returns for two trend-followers in different inflationary regimes. Included for direct comparison are the same results for commodities, shown previously in Table 2.

Asset	Return   CPI < 2.5%	Return   CPI ≥ 2.5%
BCOM	-4.2%	8.4%
GSCI	-5.4%	8.8%
Trend C.	0.4%	10.3%
Trend	4.8%	9.9%

**Table 5.** Average risk-adjusted YoY returns for commodities and trend-following in different inflationary regimes. Returns for all strategies are scaled to 10% volatility.

## 4. Conclusion

Commodities have shown to be an effective inflation hedge in the past but are volatile, have already rallied strongly and have delivered negative returns during times with low inflation. Applying a simple trend-following strategy to commodities would have improved this situation historically; it would have controlled volatility, delivered a better risk-adjusted upside in inflationary periods but without the negative returns when inflation normalizes, resulting in a vastly superior information ratio. The situation is further improved when broader trend-following is employed, especially in terms of information ratio.

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