Expect the Unexpected: The Role of Commodities During Periods of Unexpected Inflation

Greg Liebl, CFA
Director, Investment Strategy

Adam Swinney, CFA
Investment Strategist

October 2023

Understandably, in high-inflation environments, investors often look for strategies to help protect their assets. Commonly owned assets like stocks and bonds may act as a buffer, but only in the event high inflation is expected. In periods of higher-than-expected inflation, on the other hand, history shows that commodities often outperform both. This whitepaper looks into the possible reasons.

Key takeaways

» Unexpectedly high inflation tends to be harmful to traditional assets as valuations of both equities and bonds are reset lower, potentially hindering price growth.

» Our analysis shows that during periods of unexpectedly high inflation, a diversified basket of commodities performed the strongest, more than doubling the next closest asset class.

» Higher-than-expected inflation can indicate strong growth in the economy, increasing demand for raw materials and driving up commodity prices.

» Inflation can result from many different factors and can have unpredictable effects across economic sectors. Because of this, a diversified commodity portfolio can be preferred when seeking inflation mitigation.

Parametric

Inflation mitigation

A key goal for many investors is maintaining the purchasing power of their assets. In a simple sense, this means that the return generated on their portfolio needs to exceed the rate of inflation in the economy. For most commonly owned assets, this doesn't pose a problem because a portion of their expected return is tied to being compensated for expected inflation. Thus, when inflation expectations match reality, most investors do just fine given their exposure to traditional assets, such as stocks and bonds.

The trouble starts when the inflation that materializes is drastically different from what was priced in or expected by market participants. This can result in a profound effect on returns because asset prices have historically been much more sensitive to inflation surprises than to inflation itself.

To help illuminate these scenarios, figure 1 lays out in broad strokes which asset classes are expected to do well in various inflationary environments. The most common outcome is that inflation comes in close to market expectations. This is typically a sign of positive economic growth as well as an indication that growth is proceeding close to market expectations. Accordingly, traditional asset classes are expected to do well. In times of deflation, fixed cash flows become increasingly important as economic growth becomes more challenged. This tends to benefit fixed income holdings and cash, though bonds with a longer duration are expected to do particularly well when deflation's unexpected.

Let's address the remaining case of unexpected inflation. This environment tends to be harmful to traditional asset classes as discount rates implicit in the valuation of equities and bonds are reset higher, leading to a decline in prices. Commodities, on the other hand, tend to reprice to the benefit of the investor as recast inflation expectations are reflected in higher forward prices.

Most portfolios already carry allocations to more traditional assets, such as stocks and bonds, but may lack exposure to assets that do well during periods of unexpectedly high inflation. It's in this environment, however, that an investor's portfolio may be most vulnerable. Not only can higher-than-expected inflation erode its purchasing power, but falling stock and bond prices may also erode its market value. Investors looking to hedge this risk may be best served by increasing their exposure to asset classes that have a positive expected return when unexpected inflation hits. Historically, commodities have served this purpose well, outperforming other asset classes when inflation has been unexpectedly high.

Below, we discuss what inflation expectations are and how we've chosen to measure them. In addition, we present historical evidence to support our claim that commodities outperform other asset classes during periods of unexpectedly high inflation.

FIGURE 1: ASSET CLASSES EXPECTED TO PERFORM WELL IN INFLATIONARY ENVIRONMENTS

	Inflation	Deflation
Expected	Equities, bonds, inflation-linked securities, real assets	Cash
Unexpected	Commodities	Long bonds, cash

Sources: Bloomberg, Parametric, 6/30/2023. For illustrative purposes only. Not a recommendation to buy or sell any security.

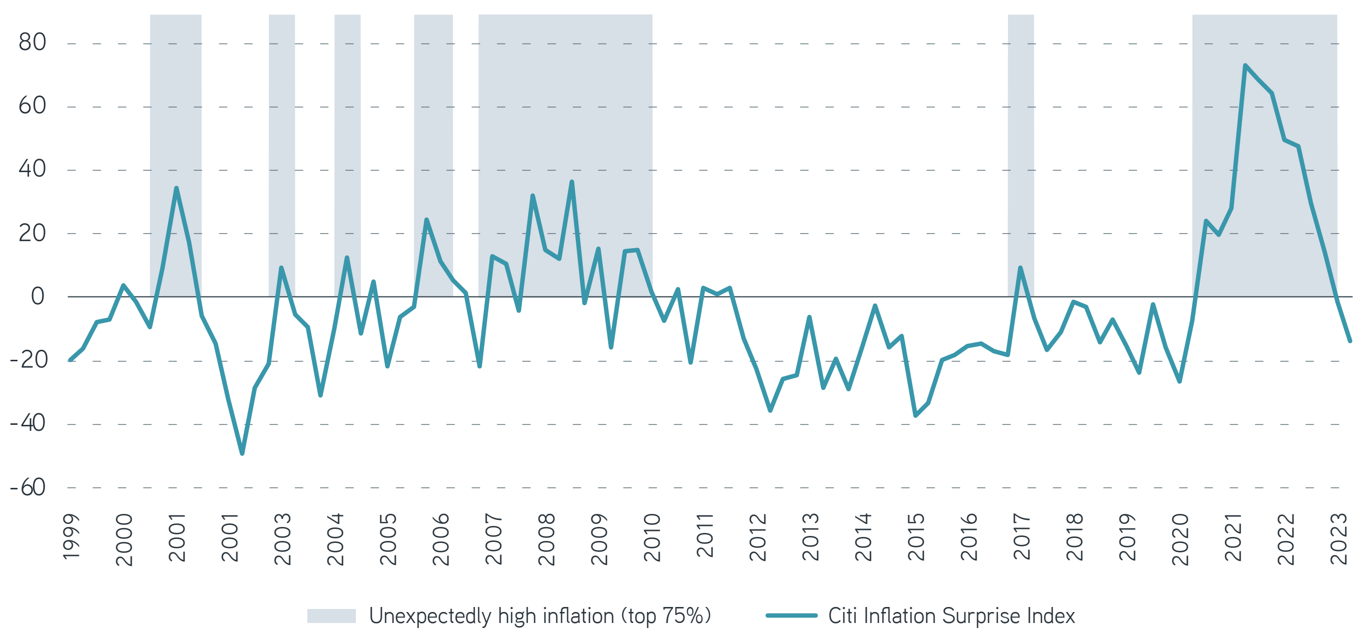
Performance during unexpected inflationary periods over the last 25 years

Measuring expected inflation is challenging for many reasons. Surveys tend to have spotty accuracy, at both the household and professional levels. Likewise, many economic models, including regime-switching or term-structure models, have also proven inaccurate. As the US Treasury Inflation-Protected Securities (TIPS) market has developed breadth and liquidity over the past two decades, market-based metrics have become available. Unfortunately, technical pressures within the TIPS market can drive these breakeven rates, so they can reflect factors other than changes to inflation expectations. For simplicity, we've chosen to use Citigroup's long-standing Inflation Surprise Index[1] as a means to detect inflation surprises in the economy. This index has a natural appeal in that it aggregates a number of different economic forecasts and official results, leading to a more durable assessment of when inflation has indeed missed expectations.

For our analysis, we constructed a diversified commodity basket, using end-of-day pricing for Bloomberg and S&P GSCI® total return subindexes, to represent a broad-based exposure to the commodity asset class. This diversified basket reflects the impact of price changes of a commodity futures portfolio along with an assumed T-bill return on collateral.[2] While we could have chosen to use a passive commodity index, such as the Bloomberg Commodity Index, in our analysis, we find most suffer from concentration issues that may distort the findings. As such, constructing our own diversified basket should give us a better view into how the average commodity behaves during periods of unexpected inflation. The appendix lists the commodities we included in the diversified basket and their corresponding weights.[3] We rebalanced the basket monthly.

Next, we classified each period as a positive or negative surprise by looking at the quarterly value of the Citi Inflation Surprise Index. A positive reading means that the releases have been higher than expected, while a negative reading means that releases have been lower than expected. Using this methodology, we calculate 36 positive surprises and 62 negative surprises between January 1999 and June 2023.[4] We defined each period as having unexpectedly high inflation if the positive surprise fell within the top 75%[5] of quarterly observations, which was roughly one-quarter of the time over this period. Figure 2 displays these historical inflation surprises along with the periods of unexpectedly high inflation.

FIGURE 2: INFLATION SURPRISES, JANUARY 1999–JUNE 2023



Sources: Parametric, Bloomberg, Citigroup, 6/30/2023. For illustrative purposes only. Not a recommendation to buy or sell any security. Past performance is not indicative of future results. All investments are subject to loss. It is not possible to invest directly in an index. Indexes are unmanaged and do not reflect the deduction of fees or expenses.

In figure 3, we present the results of our historical analysis, which reviewed how various asset classes[6] performed during times of unexpectedly high inflation. We find that a diversified basket of commodities performed the strongest during these periods, with an average quarterly return of 3.85%. This was more than double the next closest asset class, real estate investment trusts (REITs). In addition, when we account for the volatility of the asset class in those quarters, we find that commodities again were a top performer. Per unit of risk, commodities delivered a return of 0.36% above cash.

We believe the reason for commodities leadership in this environment is twofold: First, higher-than-expected inflation is often associated with strong underlying growth in the economy, which drives demand for raw materials and puts upward pressure on commodity prices. Second, food and energy consumption are large components of the Consumer Price Index (CPI), so it follows that rising prices in those categories will be reflected in corresponding futures contracts.

REITs also held up well during these periods because higher interest rates—and, with them, mortgage rates and rents—were passed on to investors, though they did exhibit the highest degree of volatility of any asset class considered. On average, US equities delivered a positive return but trailed well behind the rate of inflation. In contrast, rising rates proved discouraging for US fixed income returns, which experience a price decline when yields increase. Finally, TIPS performed effectively in line with CPI during these periods, which isn't altogether surprising given their tie to realized inflation.

Why a basket of commodities?

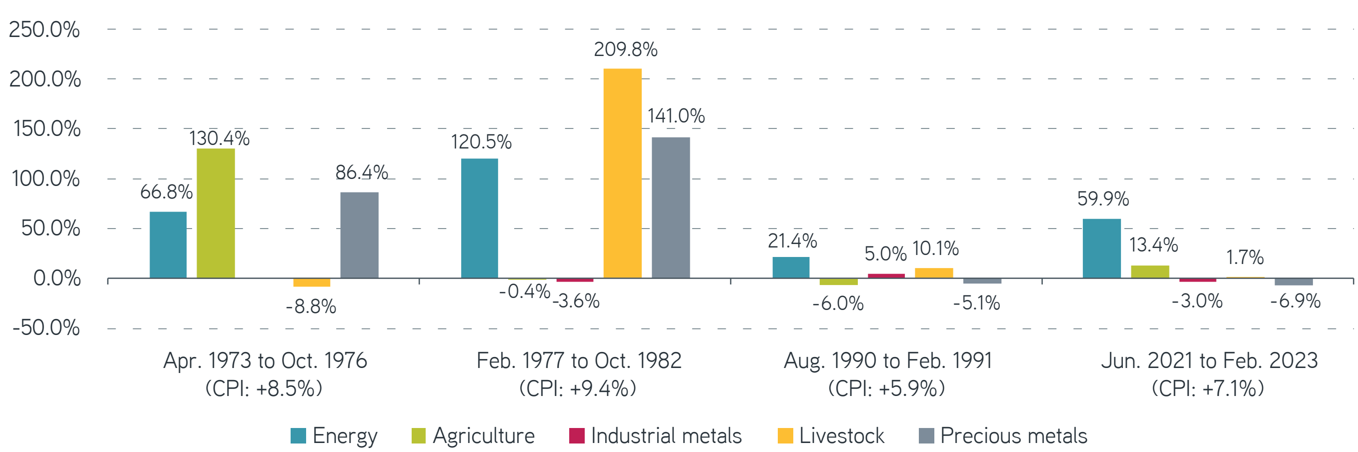
While it's clear that a diversified basket of commodities may do well during periods of unexpected inflation, there's a common belief that one commodity or commodity sector provides "better" inflation mitigation than a diversified basket. Historical evidence doesn't support this belief, however. Instead, we see varying patterns of inflation sensitivity, depending on which period we examine. Figure 4 details commodity sector performance during four notable outbreaks of high inflation.[7]

FIGURE 3: RELATIVE PERFORMANCE IN QUARTERS OF UNEXPECTEDLY HIGH INFLATION, JANUARY 1999–JUNE 2023[6]

	CPI-U	T-bills	US equities	International equities	US fixed income	TIPS	REITs	Diversified commodities
Average quarterly return	1.09%	0.52%	0.74%	0.13%	0.09%	0.96%	1.59%	3.85%
Standard deviation of quarterly return			8.26%	9.79%	2.53%	3.18%	12.04%	9.25%
Sharpe ratio			0.03	-0.04	-0.17	0.14	0.09	0.36

Sources: Parametric, Bloomberg, 6/30/2023. For illustrative purposes only. Past performance is not indicative of future results. All investments are subject to loss. It is not possible to invest directly in an index. Indexes are unmanaged and do not reflect the deduction of fees or expenses.

FIGURE 4: COMMODITY SECTOR PERFORMANCE IN PERIODS OF HIGH INFLATION



Sources: Parametric, Bloomberg, 6/30/2023. For illustrative purposes only. Past performance is not indicative of future results. All investments are subject to loss. It is not possible to invest directly in an index. Indexes are unmanaged and do not reflect the deduction of fees or expenses.

The lack of consistency in performance leadership is notable: Agriculture led in the first period, only to lag in the next two. Precious metals did quite well in the first and second periods, only to trail in the third and fourth. More recently, energy has emerged as a top-performing sector. All of this emphasizes our thesis that it's impossible to predict which individual commodity or sector will outperform. Inflation may result from rising energy prices, higher food costs, or greater input prices for manufacturers. Factors such as technological innovation, weather patterns, labor strife, broader economic conditions, and even the political climate all impact inflation sensitivity. For this reason, we recommend a broadly diversified basket of commodity futures when seeking help mitigating inflation.

Conclusion

Investors have historically included commodities in the asset-allocation process for their diversification benefits and sensitivity to inflation. For most asset classes, when inflation matches or comes in below expectations, investors either are unharmed (as inflation expectations are already priced into forecasted asset returns) or benefit from higher real returns. However, as we've shown, very few assets perform well during periods when inflation exceeds expectations. When looking for help protecting the purchasing power of their assets, investors may want to focus on the specific environments in which inflation exceeds expectations. Commodities, relative to either stocks or bonds, have historically offered the greatest opportunity for positive performance in these environments. We believe that including commodities in a portfolio not only offers the opportunity for increased diversification but can also help mitigate the worst inflationary outcomes.

Appendix: Diversified commodities basket

Commodity	Sector weight	Commodity weight
Bloomberg Natural Gas Total Return Index		5%
Bloomberg WTI Crude Oil Total Return Index		5%
Bloomberg Brent Crude Total Return Index	30%	5%
Bloomberg Unleaded Gasoline Total Return Index		5%
Bloomberg Gas Oil Total Return Index		5%
S&P GSCI Heating Oil Total Return Index		5%
Bloomberg Wheat Total Return Index		2.27%
Bloomberg Kansas Wheat Total Return Index		2.27%
Bloomberg Corn Total Return Index		2.27%
Bloomberg Soybeans Total Return Index		2.27%
Bloomberg Soybean Oil Total Return Index		2.27%
Bloomberg Soybean Meal Total Return Index	25%	2.27%
Bloomberg Sugar Total Return Index		2.27%
Bloomberg Cotton Total Return Index		2.27%
Bloomberg Coffee Total Return Index		2.27%
Bloomberg Cocoa Total Return Index		2.27%
Bloomberg Orange Juice Total Return Index		2.27%
Bloomberg Aluminum Total Return Index		3.57%
S&P GSCI Copper (LME) Total Return Index		3.57%
Bloomberg Copper (NY) Total Return Index		3.57%
Bloomberg Zinc Total Return Index	25%	3.57%
Bloomberg Nickel Total Return Index		3.57%
Bloomberg Lead Total Return Index		3.57%
Bloomberg Tin Total Return Index		3.57%
Bloomberg Gold Total Return Index		3.75%
S&P GSCI Silver Total Return Index	15%	3.75%
S&P GSCI Platinum Total Return Index		3.75%
Bloomberg Palladium Total Return Index		3.75%
Bloomberg Live Cattle Total Return Index		1.67%
S&P GSCI Lean Hogs Total Return Index	5%	1.67%
Bloomberg Feeder Cattle Total Return Index		1.67%

Sources: Parametric, Bloomberg, Citigroup, 6/30/2023. For illustrative purposes only. Not a recommendation to buy or sell any security. Client experiences will vary. It is not possible to invest directly in an index. Indexes are unmanaged and do not reflect the deduction of fees or expenses.

Notes

1. The Citi Inflation Surprise Index is an accumulation of headline CPI, Producer Price Index, and wage surprises relative to median expectations of professional forecasters.

2. Unlike other investments, commodity futures require only a portion of the total contract value to be posted as initial margin, while the remaining portion can be left unfunded. For this reason, commodity futures indexes are published as either excess return or total return. Excess return indexes reflect only the movement of the underlying commodity futures contracts themselves. Total return indexes assume there's cash supporting the commodity futures positions and assume a cash-based return (90-day T-bills) for the collateral, in addition to the return generated from the commodity futures contracts.

3. Ideally, our preference would be to simply assign equal weights to all commodities included in the diversified portfolio. Unfortunately, this is impractical because of varying levels of liquidity across commodities. To balance diversification with constructing a realistic paper portfolio, we chose to assign static sector weights that align with underlying liquidity conditions and to weight commodities within sectors equally.

4. Our analysis uses a time frame that represents data availability for all indexes presented in figures 2 and 3.

5. Taking the top 75% of observations allows for a modest amount of uncertainty around our calculation and conservatively limits our sample to larger surprises to better test how various assets have performed when inflation really is unexpected.

6. We represent diversified commodities using the Diversified Commodities Basket, as previously described. CPI-U represents Consumer Price Index for All Urban Consumers, T-bills represent the ICE BofA US 3-Month Treasury Bill Index, US equities represent the MSCI USA Gross Total Return USD Index, international equities represent the MSCI ACWI ex USA Net Total Return USD Index, US fixed income represents the Bloomberg US Aggregate Index, TIPS represent the Bloomberg US Treasury Inflation-Linked Bond Index, and REITs represent the FTSE NAREIT All Equity REITS Total Return Index.

7. The purpose of this information is to provide historical examples of commodity futures performance during periods of high inflation (greater than 5%). Commodity sector performance represents the respective S&P GSCI total return subindex, except for energy. S&P GSCI energy subindex data is available back to 1983. For periods before 1983, we use the US CPI Urban Consumers All Items Energy Commodities NSA published by the Bureau of Labor Statistics and the S&P GSCI energy subindex thereafter.

About

Parametric Portfolio Associates® LLC ("Parametric"), headquartered in Seattle, is registered as an investment advisor with the US Securities and Exchange Commission under the Investment Advisers Act of 1940. Parametric is a leading global asset management firm, providing investment strategies and customized exposure management directly to institutional investors and indirectly to individual investors through financial intermediaries. Parametric offers a variety of rules-based investment strategies, including alpha-seeking equity, fixed income, alternative, and options strategies. Parametric also offers implementation services, including customized equity, traditional overlay, and centralized portfolio management. Parametric is part of Morgan Stanley Investment Management, the asset management division of Morgan Stanley, and offers these capabilities through offices located in Seattle, Boston, Minneapolis, New York, and Westport, Connecticut.

Disclosures

This material may not be forwarded or reproduced, in whole or in part, without the written consent of Parametric. Parametric and its affiliates are not responsible for its use by other parties.

This information is intended solely to report on investment strategies and opportunities identified by Parametric. Opinions and estimates offered constitute our judgment and are subject to change without notice, as are statements of financial market trends, which are based on current market conditions. We believe the information provided here is reliable but do not warrant its accuracy or completeness. This material is not intended as an offer or solicitation for the purchase or sale of any financial instrument.

Past performance is not indicative of future results. The views and strategies described may not be suitable for all investors. Investing entails risks, and there can be no assurance that Parametric will achieve profits or avoid incurring losses. Parametric and Morgan Stanley do not provide legal, tax, or accounting advice or services. Clients should consult with their tax or legal advisor prior to entering into any transaction or strategy described herein.

Charts, graphs, and other visual presentations and text information were derived from internal, proprietary, or service vendor technology sources or may have been extracted from other firm databases. As a result, the tabulation of certain reports may not precisely match other published data. Data may have originated from various sources, including, but not limited to, Bloomberg, MSCI/Barra, FactSet, or other systems and programs. Parametric makes no representation or endorsement concerning the accuracy or propriety of information received from any third party.

The Bloomberg Commodity Index (BCOM) is formerly known as the Dow Jones-UBS Commodity Index. BCOM is a broadly diversified index composed of futures contracts on physical commodities. Bloomberg® is a trademark and service mark of Bloomberg Finance L.P. and its affiliates (collectively "Bloomberg"). Barclays® is a trademark and service mark of Barclays Bank Plc (collectively with its affiliates "Barclays"), used under license. Bloomberg or Bloomberg's licensors, including Barclays, own all proprietary rights in the Bloomberg Barclays indices. Neither Bloomberg nor Barclays approves or endorses this material, guarantees the accuracy or completeness of any information herein, or makes any warranty, express or implied, as to the results to be obtained therefrom and, to the maximum extent allowed by law, neither shall have any liability or responsibility for injury or damages arising in connection therewith.

The S&P GSCI® Commodity Index is a broadly diversified composite index of commodity sector returns, representing an unleveraged, long-only investment in commodity futures. S&P Dow Jones Indices are a product of S&P Dow Jones Indices LLC ("S&P DJI") and have been licensed for use. S&P® and S&P 500® are registered trademarks of S&P DJI; Dow Jones® is a registered trademark of Dow Jones Trademark Holdings LLC ("Dow Jones"); S&P DJI, Dow Jones, and their respective affiliates do not sponsor, endorse, sell, or promote the strategies described herein, will not have any liability with respect thereto, and do not have any liability for any errors, omissions, or interruptions of the S&P Dow Jones Indices.

The value of commodity investments will generally be affected by overall market movements and factors specific to a particular industry or commodity, which may include weather, embargoes, tariffs, health, and political, international, and regulatory developments. Economic events and other events (whether real or perceived) can reduce the demand for commodities, which may reduce market prices and cause their value to fall. The use of derivatives can lead to losses or adverse movements in the price or value of the asset, index, rate, or instrument underlying a derivative due to failure of a counterparty or due to tax or regulatory constraints.

Parametric is headquartered at 800 Fifth Avenue, Suite 2800, Seattle, WA 98104. For more information regarding Parametric and its investment strategies, or to request a copy of Parametric's Form ADV or a list of composites, contact us at 206 694 5500 or visit www.parametricportfolio.com.

10.30.2023 | RO 3151162

Parametric