S&P Dow Jones Indices

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Why S&P GSCI? Diversification and Historical Inflation Mitigation

Financial markets in the "Roaring '20s" (of the 21st century, that is) have been dominated by surging equity markets and bouts of volatility caused by a global pandemic, inflation, geopolitical upheaval and a technology sector that has driven equity markets to all-time highs. Throughout this period, balanced strategies have been able to reap the rewards—with commodities topping the performance charts. For example, either gold or broad commodities have led all asset classes in four of the past five years (see Exhibit 1).

As inflation may remain elevated, governments may continue to expand to budget deficits and geopolitical conflicts may continue to impact the global markets, we reflect on the importance of commodities and look to the <u>S&P GSCI</u> to quantify how the broadbased commodities index has outperformed when it matters most. We will also examine how commodity performance has responded to inflation, central bank easing and periods of geopolitical uncertainty. This analysis will provide a better understanding of the importance of commodities in a broader index context.

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2020	2021	2022	2023	2024
Gold 21%	Commodities 40%	Commodities 26%	S&P 500 [®] 26%	Gold 27%
S&P 500 18%	S&P 500 29%	Cash 2%	Global Equity 23%	S&P 500 22%
Global Equity 16%	Small Cap 27%	Gold -1%	Small Cap 16%	Global Equity 20%
Small Cap 11%	Global Equity 22%	Treasuries -11%	Gold 13%	Small Cap 9%
Bonds 7%	Cash 0%	Bonds -12%	Bonds 6%	Commodities 5%
Treasuries 7%	Bonds -1%	Small Cap -16%	Cash 5%	Bonds 5%
Cash 1%	Treasuries -2%	Global Equity -17%	Treasuries 4%	Cash 4%
Commodities -24%	Gold -4%	S&P 500 -18%	Commodities -4%	Treasuries 4%

Exhibit 1: Measuring Asset Class Performance

Source: S&P Dow Jones Indices LLC. Returns for 2020 through 2023 calculated as of year-end. Index performance based on total return in USD. Returns for 2024 calculated as of Sept. 30, 2024 (YTD). Gold is represented by the <u>S&P GSCI Gold</u>. Global Equity is represented by <u>S&P Global 1200</u>. Small Cap is represented by the <u>S&P SmallCap 600[®]</u>. Bonds are represented by the <u>S&P U.S. Aggregate Bond Index</u>. Treasuries are represented by the <u>S&P U.S. Treasury Bond Index</u>. Cash is represented by <u>S&P U.S. Treasury Current 3-Month Bill Index</u>. Past performance is no guarantee of future results. Chart is provided for illustrative purposes.

When It Matters Most

The return of inflation to the global economy is one of the most significant risks to have emerged after decades of negligible price increases. After nearly a decade of zero-interest rate policy and quantitative easing, policy makers found themselves focused on the inflationfighting side of their dual mandate. Equities and bonds tend to deliver below-average returns in rising inflation environments, while inflation-sensitive assets (such as commodities, inflationlinked bonds, REITs, natural resource stocks and gold) have historically been able to maintain performance during these periods. Commodity outperformance has delivered on its reputation as an inflation-sensitive asset, with the S&P GSCI up 40% and 26% in 2021 and 2022, respectively.

Going further back in time, broad commodities have done well when inflation was elevated and the U.S. Federal Reserve maintains a defensive posture. Breaking inflation into low, medium and high inflationary environments, commodities have experienced double-digit annual gains when inflation exceeded 2%. The average one-year return when inflation measured between 2% and 4% was 14.8%. Exhibit 2 highlights how the S&P GSCI has performed during inflationary periods relative to another broad commodity benchmark, the Bloomberg Commodities Index (BCOM).



Exhibit 2: S&P GSCI and BCOM Average One-Year Returns by Inflationary Tiers

Source: S&P Dow Jones Indices LLC, Refinitiv, www.lseg.com/lseg/eikon. Data as of Sept. 30, 2024. Average returns are average one-year returns. Past performance is no guarantee of future results. Chart is provided for illustrative purposes.

In this analysis, we selected the following asset classes to compare their sensitivity to inflation: the S&P GSCI, <u>S&P Real Assets Index</u>, <u>S&P U.S. TIPS Index</u> and an alternative commodity benchmark, the BCOM. The S&P GSCI selects liquid commodities and is weighted by the global production on a market value basis to represent the relative importance of each of its 24 constituents to the overall economy. The S&P Real Assets Index measures global property, infrastructure, commodities and inflation-linked bonds. The S&P U.S. TIPS Index includes inflation-linked bonds issued by the U.S. Treasury. The BCOM is a fixed-weighted index of liquid commodities.

To better understand the relationship between returns and inflation, we need to analyze the "inflation beta" of each asset class.¹ Inflation beta measures the sensitivity of asset returns to changes in inflation. For example, an inflation beta of 5 indicates that the asset return would go up by 5% for a 1% rise in inflation. Inflation beta quantifies the inflation-hedging ability of a given asset class, since it reflects both the direction and magnitude of the change in return against the change in inflation. Inflation beta is an important determinant of inflation protection: a relatively high inflation beta means that even a small weight to such assets may offer sufficient inflation protection for a larger strategy.

Treasury Inflation-Protected Securities (TIPS), measured by the S&P U.S. TIPS Index, are among one of the most-well-known asset classes that have historically defended against inflation. However, with an inflation beta of around 1, market participants are only able to protect the portion of their composition that is invested in TIPS. The S&P GSCI's inflation beta of 17 has a multiplier effect to inflation protection.² Historically, commodities have shown an inflation beta of 17, suggesting a stronger historical correlation with inflation than TIPS.

¹ For more on inflation beta and multi-asset strategies, see Ponnala, Boal, Ye and Sinha's <u>A Dynamic Multi-Asset Approach to Inflation</u> <u>Hedging</u>.

² Inflation betas cited here are calculated as an average of the 5-year rolling inflation beta for the S&P U.S. TIPS Index and S&P GSCI TR Index, from February 2003 through September 2024. Inflation beta compares year-over-year index level returns to inflation, year-over-year changes in CPI.



Exhibit 3: Rolling 5-Year Inflation Beta for Select Asset Classes

Source: S&P Dow Jones Indices LLC, FRED. Data as of Sept. 30, 2024. Inflation beta is calculated on a 5-year rolling basis. Inflation beta compares year-over-year returns of index levels to inflation, measured as year-over-year changes in CPI. Past performance is no guarantee of future results. Chart is provided for illustrative purposes.

In traditional investment strategies, diversification aims to balance asset class risk to protect overall downside. A critical element of Harry Markowitz's seminal work on modern portfolio theory, a "free lunch" can be obtained by balancing assets to achieve the same (or better) returns with overall lower risk (or volatility). Central to this thesis is the selection of assets that have low correlations to one another. The largest asset classes typically held are stocks and bonds. Stocks and bonds have low correlations against each other historically but have increasingly risen in recent times (see Exhibit 4). Selecting alternative asset classes which have low correlations to stocks and bonds could improve diversification potential. Commodities, measured by the S&P GSCI, score well in this regard. Because real assets include equities and TIPS include bonds, they are highly correlated to the S&P 500 and S&P U.S. Aggregate Bond Index, respectively. Including real assets or TIPS may provide a bit of diversification via low-correlation stocks and bonds, respectively, but not both. Commodities, on the other hand, have low correlations to stocks and negative correlations to bonds. The S&P GSCI has a slightly lower correlation to stocks and a lower correlation to bonds than alternative benchmarks analyzed (see Exhibit 5).



Exhibit 4: Stock and Bond Diversification Diminishes with Higher Correlations to Each Other

Source: S&P Dow Jones Indices LLC. Correlations are calculated on month-over-month returns. Stocks are represented by the S&P 500, bonds are represented by the S&P U.S. Aggregate Bonds Index. Past performance is no guarantee of future results. Chart is provided for illustrative purposes.



Exhibit 5: Correlation of Alternative Asset Classes to Stocks and Bonds

Source: S&P Dow Jones Indices LLC. Correlations are calculated on monthly index total returns in USD. Data from Sept. 30, 2004, to Sept. 30, 2024, excluding the S&P Real Assets Index, which is calculated from Aug. 31, 2006, to Sept. 30, 2024. Past performance is no guarantee of future results. Chart is provided for illustrative purposes.

Commodities have historically provided performance diversification during periods of high inflation. With inflation still elevated as we near the end of 2024, but moderating, we turn our attention to more recent market developments: Namely a Fed easing cycle and the U.S. presidential election.

Another way to measure commodity performance is when the Fed maintains a restrictive stance, defined by the Fed Funds Effective Rate (FFER) exceeding the target inflation level of 2%. Going back to 1970 to September 2024, we measure the annualized returns during such periods and compare them with accommodative environments. The S&P GSCI posted

average annualized returns of 10.5% over the 39 years when the FFER was above 2%. This compares favorably to the 0.9% average annualized return during the 16 years the Fed held the effective rate below 2%.





Source: S&P Dow Jones Indices LLC, FRED. Data from Jan. 2, 1970, to Sept. 30, 2024. Restrictive monetary regimes are defined as periods during which the FFER was greater than 2 for the last 12 months. Accommodative regimes are defined as periods during which the FFER was not greater than 2 for the last 12 months. The S&P GSCI was launched April 11, 1991. All data prior to such date is back-tested hypothetical data. Past performance is no guarantee of future results. Chart is provided for illustrative purposes and reflects hypothetical historical performance. Please see the Performance Disclosure at the end of this document for more information regarding the inherent limitations associated with back-tested performance.

Looking back over the past 50 years of commodity performance, regardless of the election outcome, the S&P GSCI has had an average annual return of 11.2% following a presidential election. Expanding across asset classes, commodities have outperformed the broad equities market (as measured by the S&P 500), in the years following a Republican win and underperformed broad equities following a Democratic victory.



Exhibit 7: One-Year Performance following Presidential Elections

Source: S&P Dow Jones Indices LLC. Data from 1972 through 2021, as of Sept. 30, 2024. Index performance based on total return in USD. The S&P GSCI was launched April 11, 1991. The <u>S&P GSCI Crude Oil</u> and the S&P GSCI Gold were launched May 1, 1991. All data prior to such dates is back-tested hypothetical data. Past performance is no guarantee of future results. Chart is provided for illustrative purposes and reflects hypothetical historical performance. Please see the Performance Disclosure linked at the end of this post for more information regarding the inherent limitations associated with back-tested performance.

Index Education

In addition to inflation, the Fed and elections, geopolitics have a direct impact on commodity performance. According to Caldara and Iacoviello's Geopolitical Risk Index, the global economy is in a period of elevated geopolitical risk. In a 2024 paper, the creators of the index, who work for the Federal Reserve Board, cited that "global geopolitical risks increase inflation, with the inflationary effect of higher commodity prices."³ The S&P GSCI is a key input into to the bivariate panel VAR model used to understand the relationship between geopolitical risk and its impact on inflation, which proves the negative impact on economic activity, a decline in stock prices and higher commodity prices.

Why the S&P GSCI Is a True Commodities Market Measure

As the first major investable commodity index, the S&P GSCI's unique construction maintains an approach that evolves with the global economy. The index's methodology accounts for the global production of commodities and the index is weighted based on the total U.S. dollar value traded in the futures market. It then selects the most liquid contracts available, helping to maintain investment support levels before adding additional commodities. During the 1970s, commodity trading was dominated by cattle, corn and wheat. Derivative markets traded in Chicago allowed farmers and ranchers to hedge their production, allowing for market participants to access the agricultural sector through financial products. As cattle peaked at 132 million head in 1975, new contracts entered the S&P GSCI, which added lean hogs, sugar, silver and gold, reducing the large weight of cattle.

The 1980s brought in a new energy sector, with crude oil added to the index. Energy went on to dominate the index, with the total weight peaking in 2008. As the population growth increased the demand for food supply, agricultural commodities grew in weight. The global energy transition has slowly shifted the market away from fossil fuels, decreasing the weight of energy in favor of industrial metals. The S&P GSCI methodology follows a similar approach to the S&P 500, which is market capitalization weighted. In both indices, the weight of energy has fallen over time.

³ Do Geopolitical Risks Raise or Lower Inflation? Caldara, Conlisk, Iacoviello, Penn April 22, 2024: <u>GPR_INFLATION_PAPER.pdf</u> (matteoiacoviello.com)



Exhibit 8: Energy Weight Has Declined for the S&P 500 and S&P GSCI since 2008

Source: S&P Dow Jones Indices LLC. Data as of September 2024. S&P 500 Energy weight is calculated as the market cap of energy stocks as a percentage of the index's overall market cap. S&P GSCI Energy weight is calculated as the U.S. dollar weight of energy commodities as a percentage of the index's overall dollar weight. The S&P GSCI Energy was launched May 1, 1991. The S&P 500 Energy was launched June 28, 1996. Chart is provided for illustrative purposes and reflects hypothetical historical performance. Please see the Performance Disclosure at the end of this document for more information regarding the inherent limitations associated with back-tested performance.

The inclusion of 24 different commodities in the S&P GSCI produces an added benefit in the form of diversification. Individual commodity futures are among the most volatile segments of the financial markets. Consequently, focusing the individual constituent into a single benchmark, the S&P GSCI aims to reduce the overall volatility and enhance risk-adjusted returns.



Exhibit 9: Cross-Correlations among Commodities (24-Month, Unweighted Average Pairwise)

Source: S&P Dow Jones Indices LLC. Data as of September 2024. Past performance is no guarantee of future results. Chart is provided for illustrative purposes. Cross-correlation is defined as 24-month, unweighted average pairwise correlations.

Creating an investable index is achieved through the inclusion of futures contracts with a set expiry date. The index then rolls each contract as they near maturity, over a period of five days to maximize liquidity. Selecting contracts near maturity, the index calculates an "excess return." When spot markets are bid up due to supply constraints, futures markets offer a roll yield, a phenomenon known as backwardation. This is the defining feature between the S&P GSCI and the S&P GSCI Excess Return (ER).

The Ecosystem Surrounding the S&P GSCI

As a widely used commodity index, the S&P GSCI is integrated within a broader liquidity ecosystem. Tracking the index can be done in several ways: underlying futures contracts on global exchanges; over-the-counter (OTC) swaps; listed S&P GSCI futures or swap futures on an exchange; and lastly, mutual funds and exchange-traded funds (ETFs) benchmarked to the S&P GSCI. Volumes on S&P GSCI constituent and index futures have grown since the index was launched in 1991. The rise of ETFs has also seen increases in assets under management for commodity index-based funds. The S&P GSCI plays a critical role as the commodity index ecosystem expands over time.



Exhibit 10: Commodity Futures Trade Volume

Source: S&P Dow Jones Indices LLC, Futures Industry Association ,www.fia.org. Data as of December 2023. Volumes for exchange-traded futures and options are measured by the number of contracts traded on a round-trip basis and are traded and/or cleared at more than 85 exchanges worldwide. Chart is provided for illustrative purposes.

As financial markets navigate an increasingly complex and uncertain environment, the S&P GSCI stands out for its historical diversification benefits and inflation protection. The S&P GSCI's historical performance underscores its ability to deliver substantial returns in times of rising inflation and economic distress, while its low correlation with equities and bonds has provided a buffer against volatility. The S&P GSCI's dynamic composition ensures that it remains relevant in a changing economic landscape, showcasing the inherent value of commodities.

Performance Disclosure/Back-Tested Data

The S&P GSCI was launched April 11, 1991. The S&P GSCI Crude Oil and the S&P GSCI Gold were launched May 1, 1991. The S&P GSCI Energy was launched May 1, 1991. The S&P 500 Energy was launched June 28, 1996. All information presented prior to an index's Launch Date is hypothetical (back-tested), not actual performance. The back-test calculations are based on the same methodology that was in effect on the index Launch Date. However, when creating back-tested history for periods of market anomalies or other periods that do not reflect the general current market environment, index methodology rules may be relaxed to capture a large enough universe of securities to simulate the target market the index is designed to measure or strategy the index is designed to capture. For example, market capitalization and liquidity thresholds may be reduced. Complete index methodology details are available at www.spglobal.com/spdii. Past performance of the Index is not an indication of future results. Back-tested performance reflects application of an index methodology and selection of index constituents with the benefit of hindsight and knowledge of factors that may have positively affected its performance, cannot account for all financial risk that may affect results and may be considered to reflect survivor/look ahead bias. Actual returns may differ significantly from, and be lower than, back-tested returns. Past performance is not an indication or guarantee of future results. Please refer to the methodology for the lindex for more details about the index, including the manner in which it is rebalanced, the timing of such rebalancing, criteria for additions and deletions, as well as all index calculations. Back-tested performance is for use with institutions only; not for use with retail investors.

S&P Dow Jones Indices defines various dates to assist our clients in providing transparency. The First Value Date is the first day for which there is a calculated value (either live or back-tested) for a given index. The Base Date is the date at which the index is set to a fixed value for calculation purposes. The Launch Date designates the date when the values of an index are first considered live: index values provided for any date or time period prior to the index's Launch Date are considered back-tested. S&P Dow Jones Indices defines the Launch Date as the date by which the values of an index are known to have been released to the public, for example via the company's public website or its data feed to external parties. For Dow Jones-branded indices introduced prior to May 31, 2013, the Launch Date (which prior to May 31, 2013, was termed "Date of introduction") is set at a date upon which no further changes were permitted to be made to the index methodology, but that may have been prior to the Index's public release date.

Typically, when S&P DJI creates back-tested index data, S&P DJI uses actual historical constituent-level data (e.g., historical price, market capitalization, and corporate action data) in its calculations. As ESG investing is still in early stages of development, certain datapoints used to calculate S&P DJI's ESG indices may not be available for the entire desired period of back-tested history. The same data availability issue could be true for other indices as well. In cases when actual data is not available for all relevant historical periods, S&P DJI may employ a process of using "Backward Data Assumption" (or pulling back) of ESG data for the calculation of back-tested historical performance. "Backward Data Assumption" is a process that applies the earliest actual live data point available for an index constituent company to all prior historical instances in the index performance. For example, Backward Data Assumption inherently assumes that companies currently not involved in a specific business activity (also known as "product involvement") were never involved historically and similarly also assumes that companies currently involved in a specific business activity were involved historically too. The Backward Data Assumption allows the hypothetical back-test to be extended over more historical years than would be feasible using only actual data. For more information on "Backward Data Assumption" please refer to the FAQ. The methodology and factsheets of any index that employs backward assumption in the back-tested history will explicitly state so. The methodology will include an Appendix with a table setting forth the specific data points and relevant time period for which backward projected data was used.

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