Morgan Stanley

INVESTMENT MANAGEMENT

Global Multi-Asset Viewpoint

Navigating Higher Inflation: An Empirically-Based Multi-Asset Approach

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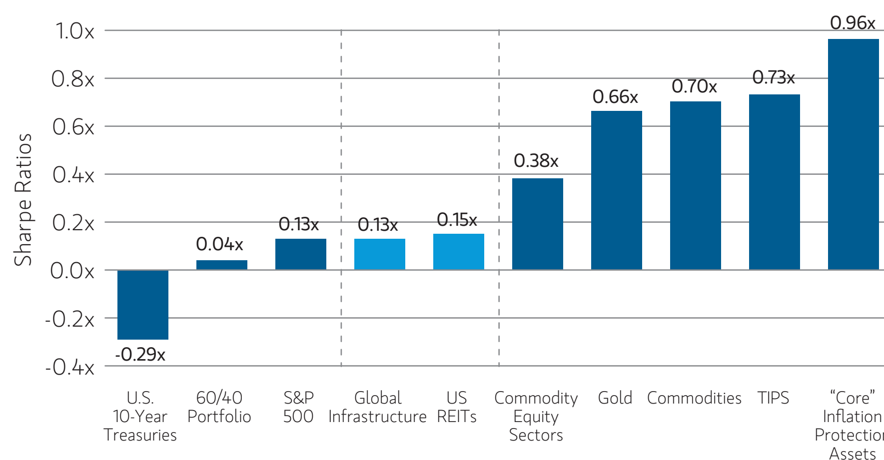
With core inflation in the U.S. reaccelerating in the past six months and nearly approaching the Fed's target of 2%, questions about the implications of this trend have become topical. If long-dormant inflation makes a lasting comeback, this would indeed represent a major regime shift in markets. Here, we explore empirical financial asset behavior in periods of higher inflation and lay out our preferred approach for constructing and managing a multi-asset inflation protection portfolio.

While not a foregone conclusion, it seems likely that inflation in the U.S. and globally has seen its low for this cycle. The output gap appears closed

DISPLAY 1

Traditional Assets Have Offered Mediocre Risk/Reward During Inflationary Periods‡

Sharpe Ratios (1973 - 2018)



‡ Accelerating inflation defined as six periods since 1973 when YoY inflation was rising (1/73-2/75; 12/76-11/80; 3/87-2/89; 6/98-7/01; 9/03-8/06; 12/10-3/12)

Source: MSIM Global Multi-Asset Team Analysis, Haver Analytics. See disclosure section for index definitions. Data as of April 30, 2018. The index performance is provided for illustrative purposes only and is not meant to depict the performance of a specific investment. **Past performance is no guarantee of future results.**

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in 48% of the global economy, which suggests inflation is set to accelerate cyclically.[1] Many of the structural disinflationary influences that have been present over the past three decades appear to have largely played out or even reversed. Furthermore, the possibility of dovish policy errors during the next downturn appear to have increased, as policymakers and academics have begun to debate aggressive policy tools like price-level targeting and government-sponsored jobs programs.

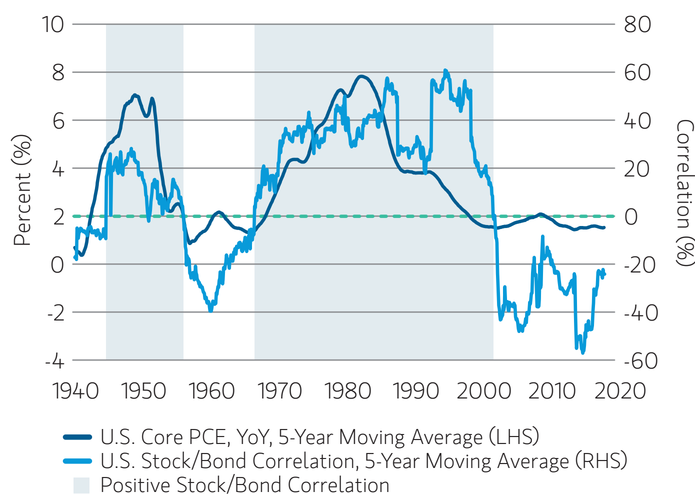
What is an investor to do if this confluence of factors results in a sustained acceleration of inflation that ultimately leads to it remaining above the Fed's 2% target for a considerable period of time?

First, it is important to remind ourselves that traditional assets and traditional portfolios (such as those with dominant equity and bond allocations) would be vulnerable in an environment of rising inflation. Since 1973, during periods when inflation accelerated, U.S. government bond returns lagged inflation by 1%, while equities exceeded it by 3.3%.[2] A traditional portfolio allocation of 60% U.S. equities and 40% U.S. government bonds outperformed inflation by just 1.6%. These traditional assets offered an unattractive risk vs. reward during this period (the 60/40 portfolio allocation offered only a 0.04x Sharpe ratio), as equities' Sharpe ratio was only 0.13x.[3] In times when inflation became a real threat—i.e. above 2% and accelerating—traditional assets performed even worse: bonds lagged inflation by 3.2%, equities beat it by only 1.4%, and a 60/40 portfolio allocation lagged it by 0.5%.[4] (Extending the analysis back another 50 years to 1920, traditional assets also did somewhat poorly when inflation was above 2% and accelerating, producing 0.17x Sharpe ratio and outperforming inflation by only 0.4%).[5] In other words, traditional assets historically have struggled to produce attractive returns when inflation was high.[6]

As we wrote in May 2017 (see: "The Importance of 2%") higher inflation would cause investors to reconsider the current orthodoxy of portfolio construction, where bonds have played an important role as diversifiers and deflation hedges.[7] In recent years, bonds have been negatively correlated to equities, and thus cushioned downside in equity bear markets, which in a low-inflation environment, were usually triggered by deflation fears. But as inflation accelerates and exceeds 2%, higher inflation rather than deflation becomes a bigger risk. If inflation remains above 2%, bonds' correlation to equities will likely revert to being positive, as it was in the three decades from the 1970s through the early 1990s when inflation was similarly above 2%.[8] Bonds would lose their value as a diversifier and a hedge, likely exacerbating their negative performance in such a scenario.

DISPLAY 2

U.S. Stock/Bond Correlation to Reverse When Inflation Returns Above 2% Threshold



Source: MSIM GMA Team Analysis; Haver Analytics. Data as of April 30, 2018. This index performance is provided for illustrative purposes only and is not meant to depict the performance of a specific investment. **Past performance is no guarantee of future results.**

While it may be relatively obvious that traditional assets perform poorly during accelerating inflation, and bonds would be particularly vulnerable, alternatives are less straightforward. It appears that consensus opinion has coalesced around hedging inflation with so called 'real assets' such as REITs and infrastructure equities, as well as conventional inflation hedges: gold and TIPS (treasury inflation-protected securities). It is true that these assets,

[1] Source: MSIM Global Multi-Asset Team Analysis; OECD; JP Morgan.

[2] Inflation is measured as core PCE deflator throughout. U.S. government bonds = 10-year U.S. Treasuries. Equities = S&P 500 Total Return in USD. Source: MSIM Global Multi-Asset Team Analysis; Bloomberg.

[3] 60/40 Portfolio Allocation represents 60% S&P 500 Total Return Index and 40% 10-year U.S. Treasuries, throughout entire Viewpoint. Please refer to "Definitions" section for index definitions.

[4] Source: MSIM Global Multi-Asset Team Analysis; Haver Analytics; Bloomberg.

[5] Ibid

[6] All returns from 1973 through April 30, 2018 unless otherwise noted.

[7] MSIM Global Multi Asset team, *Global Multi-Asset Viewpoint*. "The Importance of 2%," May 2017.

[8] Source: MSIM Global Multi-Asset Team Analysis; Haver Analytics; Bloomberg.

in aggregate, have performed better than traditional assets during periods of accelerating inflation, and produced superior risk/reward characteristics than a portfolio with a traditional 60/40 allocation. Since 1973, an equal weighted basket of REITs, infrastructure stocks, U.S. 10-Year TIPS, gold and commodities outperformed inflation by about 9.6%, with an average Sharpe ratio of 0.76x when inflation accelerated.[9] And each individually produced a better Sharpe ratio than either equities or bonds. During periods when inflation continued to accelerate above 2%, these assets also outperformed inflation by 10.3% with an average Sharpe ratio of 0.82x.[10] In other words, these so called 'real assets' are justifiably perceived to have offered inflation protection in the past, and perhaps therefore are likely to help do so in the future.

We take what we think is a more discriminating approach to analyzing inflation protection assets. First, we disaggregate the links between inflation and asset performance. Second, we consider other significant macro factors, in addition to inflation. During inflationary periods, we see a marked difference in performance among inflation protection assets, based on overall growth conditions and the direction of real rates. We construct our hedge portfolio by focusing on assets that we expect to be most sensitive to inflation and selecting those most appropriate for the overall economic regime at the time.

When we analyze linkages between asset performance and inflation, we prefer to separate the effect of inflation on cash flows from the effect on valuation. In principle, equities are a real asset, as companies can raise prices and pass on higher input costs. But because corporate pricing power and inflation's impact on costs are variable and difficult to forecast, equity earnings empirically are only loosely linked to inflation. By contrast, many REITs or infrastructure companies may have cash flows that are more directly, or even contractually, linked to inflation. However, historically neither equities broadly, nor REITs nor infrastructure stocks specifically, has produced attractive returns or risk/reward characteristics in higher inflation environments or meaningful correlation to inflation because of inflation's negative impact on their valuations. As long-duration assets, they tend to have a high sensitivity to discount rates and as such are sensitive to interest rates. This is why equity valuation multiples have tended to be negatively correlated to both inflation and interest rates. The historical correlation of REITs and infrastructure equities' performance to 10-year rates has been fairly consistently negative for the same reason. In our opinion, this makes them somewhat less effective inflation hedges.

Our preferred assets to hedge inflation are TIPS, gold, and commodities (including related equities in the energy and materials sectors), as they have tended to have a closer correlation to inflation and have produced better risk-adjusted returns during accelerating inflation. Since 1973, during periods when inflation accelerated, an equal-weighted portfolio allocation of these three assets outperformed inflation by 9.2% with a Sharpe ratio of 0.96x.[11] During accelerating and above-2% inflation, this portfolio allocation outperformed inflation by 10.2% with a Sharpe ratio of 1.06x.[12] This clearly exceeded returns and risk/reward offered by traditional assets as well as some other 'real assets' such as REITs and infrastructure stocks during periods of accelerating or high inflation *(Display 1)*.

> "Based on empirical evidence, we consider gold, TIPS and commodities to be 'core' inflation protection assets and they form the basis of our preferred inflation hedge portfolio."

Within this "core" group, we further differentiate among assets based on other components of the cyclical backdrop such as real rates and growth trends. Since 1973 when inflation accelerates amidst improving growth or rising real rates (akin to the late cycle overheating stage) commodity assets tend to do better, producing close to 20% returns above inflation and 0.8-1.0x Sharpe ratio, better than the total "core" group during that regime.[13] (Gold has also

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[9] Please refer to "Definitions" section for index definitions of REITs, infrastructure stocks, U.S. 10-Year TIPS, gold and commodities.

[10] Source: MSIM Global Multi-Asset Team Analysis; REITS = FTSE NAREIT All-REITs Index, total return, USD; Infrastructure = Dow Jones Brookfield Global Infrastructure Index (GMA Team proxy prior to 2003) total return, USD; Commodities = GSCI Index, total return, USD; Gold = total return (spot prior to 1978), TIPS = S&P 10 year U.S. TIPS Index Total Return USD (prior to 2003 ML ICE 7-10 Year US Inflation-Linked Treasury Index, prior to 1997 GMA proxy based on breakeven rate from Federal Reserve Bank of New York).

[11] Weights by risk: 33% Gold Total Return in USD, 33% U.S. TIPS, 33% Commodities (17% GSCI Index total return, in USD; 17% MSCI ACWI Energy and Materials Indices total return in USD, S&P 500 Indices prior to 1994). Actual weights may differ.

[12] Ibid.

[13] Commodity assets = GSCI Index, total return, USD; "Core" assets = weights by risk: 33% Gold Total Return in USD, 33% U.S. TIPS, 33% Commodities (17% GSCI Index total return, in USD; 17% MSCI ACWI Energy and Materials Indices total return in USD, S&P 500 Indices prior to 1994). Actual weights may differ.

performed well in such environments, despite rising real rates. This is likely due to the more dominant effect of U.S. dollar weakness during periods of strong global growth). When inflation rises as growth decelerates or real rates fall (loosely, during stagflation), gold and TIPS tend to perform best, unsurprisingly. Although commodities have done less well (underperformed gold and TIPS) during this stage, they have still outperformed traditional assets. Our preference is therefore to optimize inflation hedges based on the growth or real rates regime. In other words, while higher inflation would be a major force in markets, the stage of the economic cycle will continue to matter for relative asset class performance, as it historically has. Our approach to inflation hedging and investing during higher inflation continues to be a comprehensive one which takes other influences into account and is not based on inflation only, no matter how powerful it may become.

Had an investor held a static "core" inflation hedge portfolio since 1973, how would it have performed and how might it compare with a more traditional portfolio allocation?[14] The full period total return of the "core" portfolio allocation would have been 7.8% per year, or 4.4% above inflation with a Sharpe ratio of 0.38x. This is respectable, for a hedge, but somewhat worse than a U.S. 60/40 portfolio allocation whose annual return was 9.4% with a Sharpe of 0.46x. Interestingly, contrary to what might be expected, "core" portfolio allocation returns were not concentrated in the high inflation 1970s. In fact, the "core" portfolio allocation generated positive real returns in two-thirds of the years since 1973, with some of the highest real return years occurring in the past two decades.

However when inflation accelerated, the "core" portfolio allocation outperformed a 60/40 portfolio allocation, producing 13.6%, or 9.2% above inflation, with a Sharpe ratio of 0.96x (compared to the traditional 60/40 portfolio allocation which returned just 6%, or 1.6% above inflation). The rest of the time, when inflation was stable or decelerated, the core portfolio just about kept up with inflation, returning 4.7%, or 1.9% above inflation, while traditional assets returned 11.2% or 8.4% above inflation and generated a 0.7x Sharpe ratio. Disinflation predominated during the past 45 years, as inflation accelerated during only a third of the time. How prevalent would higher inflation environments need to become in the future for "core" assets to be likely to perform on par with traditional equities and bonds? Purely extrapolating historical performance patterns, accelerating inflation would need to be observed roughly half the time for "core" asset returns to be comparable to that of traditional ones, based on our estimates.

Much of this discussion has been based on empirical analysis. However, the past is only a guide and historical patterns should not be extrapolated blindly. Starting valuations matter, among other things, and need to be considered carefully when assessing expected returns. Higher starting valuations may preclude the "core" portfolio allocation from realizing returns consistent with history, even if higher inflation were to materialize. In this situation, the only true protection would be short-term TIPS, whose returns replicate inflation. In an inflation hedge portfolio, an allocation to such "inflation replication" assets would be appropriate.

To summarize, if inflation does in fact turn up in a sustained manner, investors would benefit from hedging a traditional 60/40 portfolio allocation, as bonds may not provide the diversification investors have come to expect and the portfolio's overall risk/reward would likely be unattractive. A "core" portfolio allocation of gold, TIPS and commodity-related assets, in our view, represents the optimal asset mix to help hedge against inflation, given its historical sensitivity to inflation and attractive risk/reward characteristics during accelerating inflation environments. When determining relative weightings within the "core" portfolio allocation, investors should consider foundational macro parameters such as growth and real rate trends. Gold and TIPS should be more heavily-weighted during stagflation, and commodity-related assets should be more heavily-weighted during inflationary overheating. As always, historical patterns are only a prologue to future performance and a comprehensive assessment of "core" inflation assets, including starting valuations and embedded expectations, would remain essential.

[14] "Core" Inflation Hedge Portfolio Allocation represents: weights by risk: 33% Gold Total Return in USD, 33% U.S. TIPS, 33% Commodities (17% GSCI Index total return, in USD; 17% MSCI ACWI Energy and Materials Indices total return in USD, S&P 500 Indices prior to 1994), throughout entire Viewpoint. Actual weights may differ. Please refer to "Definitions" section for index definitions.

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There is no assurance that a portfolio will achieve its investment objective. Portfolios are subject to market risk, which is the possibility that the market values of securities owned by the portfolio will decline and that the value of portfolio shares may therefore be less than what you paid for them. Market values can change daily due to economic and other events (e.g. natural disasters, health crises, terrorism, conflicts and social unrest) that affect markets, countries, companies or governments. It is difficult to predict the timing, duration, and potential adverse effects (e.g. portfolio liquidity) of events. Accordingly, you can lose money investing in this portfolio. Please be aware that this portfolio may be subject to certain additional risks. In general, **equity securities'** values also fluctuate in response to activities specific to a company. Investments in **foreign markets** entail special risks such as currency, political, economic, and market risks. 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If the Portfolio failed to qualify as a regulated investment company, it would be subject to federal and state income tax on all of its taxable income at regular corporate tax rates with no deduction for any distributions paid to shareholders, which would significantly adversely affect the returns to, and could cause substantial losses for, Portfolio shareholders. **LIBOR Discontinuance or Unavailability Risk**. The regulatory authority that oversees financial services firms and financial markets in the U.K. has announced that, after the end of 2021, it would no longer persuade or compel contributing banks to make rate submissions for purposes of determining the LIBOR rate. As a result, it is possible that commencing in 2022 , LIBOR may no longer be available or no longer deemed an appropriate reference rate upon which to determine the interest rate on or impacting certain derivatives and other instruments or investments comprising some of the Fund's portfolio. **Portfolio Turnover**. 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