

# Want to Mitigate Inflation? Take a Portfolio Approach

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How to construct portfolios for a variety of inflation scenarios.

A surge in U.S. consumer prices has energized the debate about inflation and what investors should do about it.

Inflationistas believe massive fiscal and monetary stimulus is setting off a self-sustaining cycle of rising prices. Others, including the Federal Reserve and the Biden Administration, say elevated inflation readings in recent months will prove transitory. They stem chiefly from temporary factors such as supply bottlenecks and a spike in post-pandemic consumer demand.

Our July *Research* paper, “Assessing Inflation: Theories, Policies and Portfolios,” argues that the debate over inflation generally suffers from a lack of definition – and, therefore, comprehension. Measures of inflation can vary widely and some, such as the consumer price index, tend to overstate inflation. Theories of inflation also have evolved, having undergone two major inflection points since the 1970s.

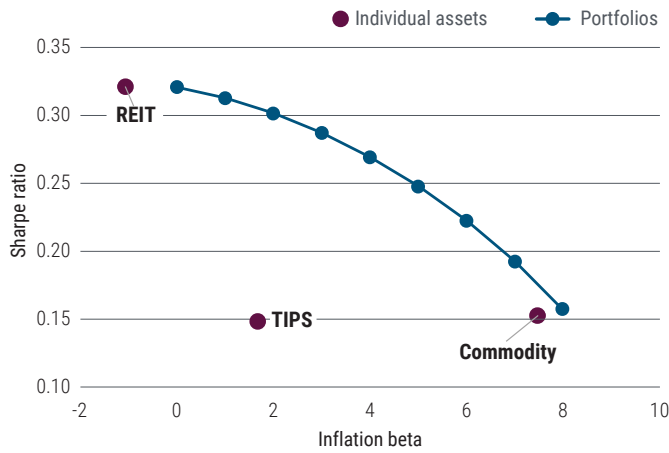
Currently, we believe there are fatter inflation tails than the market has expected. But longer term, there is a high probability that inflation will be contained. However, for investors who wish to hedge against inflation risk, we demonstrate how a portfolio approach that combines multiple strategies may be effective in a variety of inflation scenarios.

## A PORTFOLIO APPROACH FOR INFLATION-HEDGING

The potential benefits of a portfolio approach are easy to see.

Consider a simple example with three commonly used inflation-hedging assets: Treasury Inflation-Protected Securities (TIPS), commodities and real estate investment trusts (REITs).<sup>i</sup> Figure 1 plots inflation beta versus the Sharpe ratio for optimal portfolios with different inflation beta targets, as well as the three individual assets.<sup>ii,iii</sup> The results show that optimal portfolios have the potential to deliver better return and/or hedging benefits than individual asset classes.

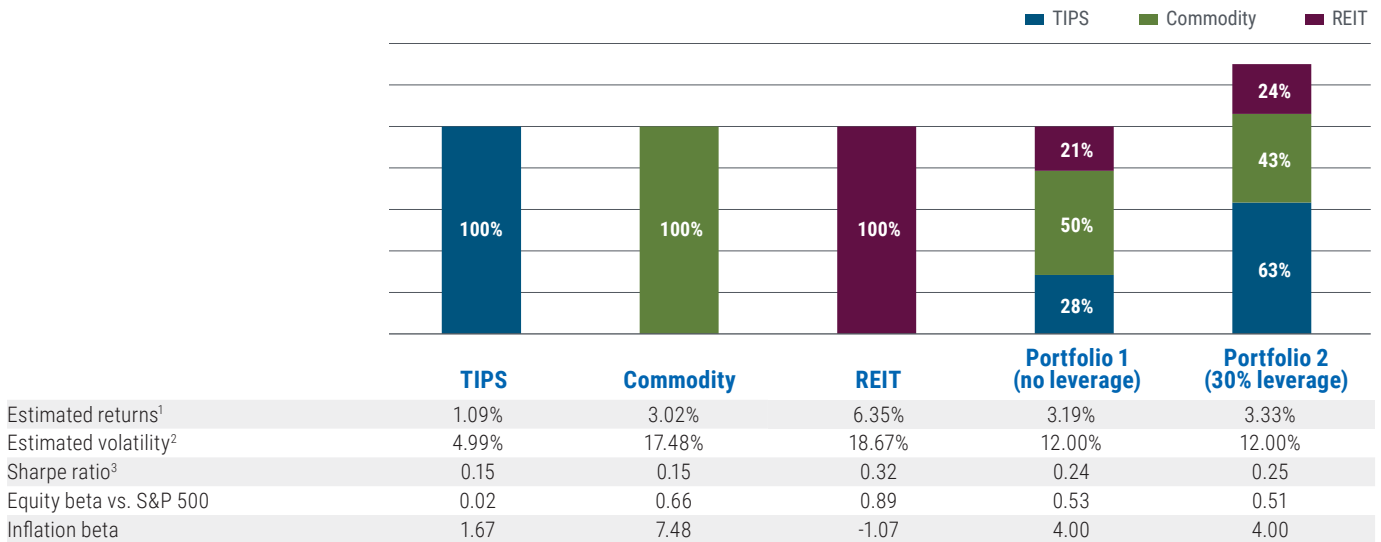
Figure 1: Three assets are better than one



Source: PIMCO and Bloomberg as of 31 March 2021. **Hypothetical example for illustrative purposes only.** Exhibit is provided for illustrative purposes and is not indicative of the past or future performance of any PIMCO product.

Figure 2 details our assumptions about the characteristics of these asset classes and how they can be combined in diversified portfolios with greater estimated returns and lower volatility, on a leveraged and unleveraged basis. The two portfolios have positive inflation betas and achieve higher estimated returns and Sharpe ratios than individual asset classes, except for REITs, which have a negative inflation beta.

Figure 2: Portfolios may improve estimated Sharpe ratios and/or inflation-hedging properties



1 For indices, return estimates are the five-year capital market assumption and are based on the product of risk factor exposures and projected risk factor premia, which rely on historical data, valuation metrics and qualitative inputs from senior PIMCO investment professionals.

2 Refer to appendix for additional information.

3 The Sharpe ratio is defined as (estimated portfolio return - estimated cash return) / estimated volatility. Estimated cash return = 0.35%.

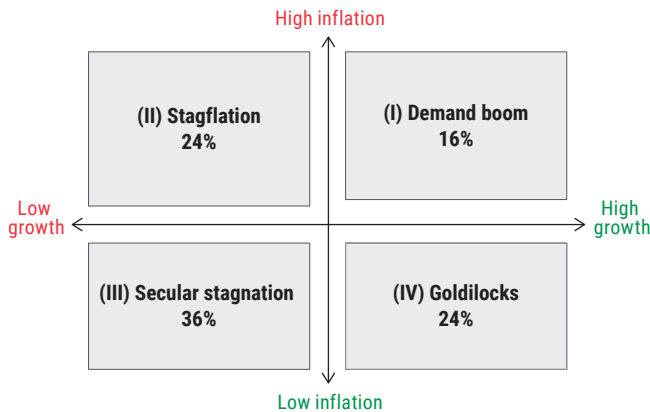
Source: PIMCO and Bloomberg as of 31 March 2021. **Hypothetical example for illustrative purposes only.** The exhibit is provided for illustrative purposes and is not indicative of the past or future performance of any PIMCO product.

### MACROECONOMIC SCENARIOS AND ASSET TILTS

Optimizing the overall portfolio also requires factoring in how individual asset classes may perform in various macroeconomic scenarios. Figure 3 shows four macro

scenarios and our probability estimates for each. These reflect our current views on macroeconomic scenarios and their probabilities, as well as the allocations in the following analysis, all of which are subject to change.

Figure 3: Macroeconomic scenarios matter



Source: PIMCO. **Hypothetical examples for illustrative purposes only.**

**PUTTING IT ALL TOGETHER**

The bar chart in Figure 4 shows asset tilts with respect to the market portfolio under each scenario, as well as the probability-weighted average of the four scenarios.<sup>iv</sup>

As expected, inflation-hedging assets such as global inflation-linked bonds and commodities have higher expected returns in inflationary scenarios. However, a higher return does not necessarily translate to a higher optimal weight in a given scenario. What matters most is relative returns across assets under each scenario. For example, in the stagflation scenario, the portfolio tilts toward various inflation-hedging assets such as inflation-linked bonds, commodities and private natural resources.

Figure 4: Expected returns and asset tilts under various scenarios

Asset class*	Asset tilts														
	Δ(Expected return)				Long-only					Long/short					
	I	II	III	IV	I	II	III	IV	Avg	I	II	III	IV	Avg	
U.S. equity															
Non-U.S. DM equity															
EM equity															
U.S. Agg															
Global Agg ex-U.S.															
Global high yield															
Global ILB															
Commodity															
Real estate															
Private equity															
Private debt															
Private infrastructure															
Private natural resources															

Source: PIMCO as of May 2021. **Hypothetical examples for illustrative purposes only.** Figure is provided for illustrative purposes and is not indicative of the past or future performance of any PIMCO product.

Legend: Green = scenario-specific return higher than implied return; red = scenario-specific return lower than implied return

\* See appendix for details on proxies used for risk modeling.

Overall, the results show that inflation-hedging assets can play a constructive role in an overall portfolio, even when the total probability of higher-than-expected inflation is low at 40%.

Furthermore, we should note that these results reflect our current views on macroeconomic scenarios, and allocations are subject to change. Please refer to the full *Research* paper for a complete analysis and information on methodologies and calculations.

## APPENDIX

### PROXIES FOR RISK MODELING

Asset classes	Proxy
U.S. equity	Russell 3000 Index
Non-U.S. DM equity	MSCI World ex USA Index
EM equity	MSCI Emerging Markets Index
U.S. Aggregate	Bloomberg Barclays US Aggregate Bond Index
Global Aggregate ex-U.S.	Bloomberg Barclays Global Aggregate ex-USD Index
Global high yield	Bloomberg Barclays Global High Yield Index
Global ILB	Bloomberg Barclays World Government Inflation-Linked Bond Index
Commodity	Bloomberg Commodity Total Return Index
Real estate	PIMCO private real estate model
Private equity	PIMCO private equity model
Private debt	PIMCO broad private credit model
Private infrastructure	PIMCO private infrastructure model
Private natural resources	PIMCO private natural resource model

- i TIPS are proxied by the Bloomberg Barclays US Treasury Inflation Notes Total Return Index; REITs are proxied by the FTSE Nareit Equity REITS Total Return Index; and commodities are proxied by the Bloomberg Commodity Index.
- ii Inflation beta is calculated by regressing asset's excess returns onto inflation surprise and growth surprise. An inflation beta of  $x$  can be interpreted as if realized inflation is 1% higher than expected; all else equal, the assets excess return will be  $x\%$  higher.
- iii The optimal portfolio achieves the highest return with inflation beta equal to the target. We allow for a maximum of 30% leverage and volatility is no larger than 18%.
- iv We first calculate implied returns, which are a set of returns in which market-capitalization weights are mean-variance optimal; we then calculate scenario-specific returns and the optimal portfolio under each scenario.

**The analysis contained in this paper is based on hypothetical modeling.** Hypothetical performance results have many inherent limitations, some of which are described below. No representation is being made that any account will or is likely to achieve profits or losses similar to those shown. In fact, there are frequently sharp differences between hypothetical performance results and the actual results subsequently achieved by any particular trading program or strategy.

One of the limitations of hypothetical performance results is that they are generally prepared with the benefit of hindsight. In addition, hypothetical trading or modeling does not involve financial risk, and no hypothetical example can completely account for the impact of financial risk in actual trading. For example, the ability to withstand losses or to adhere to a particular trading program in spite of trading losses, are material points which can also adversely affect actual trading results. There are numerous other factors related to the markets in general or to the implementation of any specific trading program which cannot be fully accounted for in the preparation of hypothetical performance results, all of which can adversely affect actual results. No guarantee is being made that the stated results will be achieved.

The allocation models presented here are based on what PIMCO believes to be generally accepted investment theory. They are for illustrative purposes only and may not be appropriate for all investors. The allocation models are not based on any particularized financial situation, or need, and are not intended to be, and should not be construed as, a forecast, research, investment advice or a recommendation for any specific PIMCO or other strategy, product or service. Individuals should consult with their own financial advisors to determine the most appropriate allocations for their financial situation, including their investment objectives, time frame, risk tolerance, savings and other investments.

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**Return assumptions** are for illustrative purposes only and are not a prediction or a projection of return. Return assumption is an estimate of what investments may earn on average over the long term. Actual returns may be higher or lower than those shown and may vary substantially over shorter time periods.

We employed a block bootstrap methodology to calculate volatilities. We start by computing historical factor returns that underlie each asset class proxy from January 1997 through the present date. We then draw a set of 12 monthly returns within the dataset to come up with an annual return number. This process is repeated 25,000 times to have a return series with 25,000 annualized returns. The standard deviation of these annual returns is used to model the volatility for each factor. We then use the same return series for each factor to compute covariance between factors. Finally, volatility of each asset class proxy is calculated as the sum of variances and covariance of factors that underlie that particular proxy. For each asset class, index, or strategy proxy, we will look at either a point in time estimate or historical average of factor exposures in order to determine the total volatility. Please contact your PIMCO representative for more details on how specific proxy factor exposures are estimated.

**All investments** contain risk and may lose value. **Equities** may decline in value due to both real and perceived general market, economic and industry conditions. Investing in the **bond market** is subject to risks, including market, interest rate, issuer, credit, inflation risk, and liquidity risk. The value of most bonds and bond strategies are impacted by changes in interest rates. Bonds and bond strategies with longer durations tend to be more sensitive and volatile than those with shorter durations; bond prices generally fall as interest rates rise, and low interest rate environments increase this risk. Reductions in bond counterparty capacity may contribute to decreased market liquidity and increased price volatility. Bond investments may be worth more or less than the original cost when redeemed. Investing in **foreign-denominated and/or -domiciled securities** may involve heightened risk due to currency fluctuations, and economic and political risks, which may be enhanced in **emerging markets**. **Inflation-linked bonds (ILBs)** issued by a government are fixed income securities whose principal value is periodically adjusted according to the rate of inflation; ILBs decline in value when real interest rates rise. **Treasury Inflation-Protected Securities (TIPS)** are ILBs issued by the U.S. government. **Sovereign securities** are generally backed by the issuing government. Obligations of U.S. government agencies and authorities are supported by varying degrees, but are generally not backed by the full faith of the U.S. government. Portfolios that invest in such securities are not guaranteed and will fluctuate in value. **High yield, lower-rated securities** involve greater risk than higher-rated securities; portfolios that invest in them may be subject to greater levels of credit and liquidity risk than portfolios that do not. **Commodities** contain heightened risk, including market, political, regulatory and natural conditions, and may not be appropriate for all investors. The **value of real estate** and portfolios that invest in real estate may fluctuate due to: losses from casualty or condemnation, changes in local and general economic conditions, supply and demand, interest rates, property tax rates, regulatory limitations on rents, zoning laws, and operating expenses. **REITs** are subject to risk, such as poor performance by the manager, adverse changes to tax laws or failure to qualify for tax-free pass-through of income. **Private credit** involves an investment in non-publicly traded securities which may be subject to illiquidity risk. Portfolios that invest in private credit may be leveraged and may engage in speculative investment practices that increase the risk of investment loss. **General risks about private equity and hedge fund strategies:** The strategies involve a high degree of risk and prospective investors are advised that these strategies are suitable only for persons of adequate financial means who have no need for liquidity with respect to their investment and who can bear the economic risk, including the possible complete loss, of their investment. Investors should **consult their investment professional** prior to making an investment decision.

**Bloomberg Barclays Global Aggregate ex-USD Index** provides a broad-based measure of the global investment-grade fixed income markets. The major components of this index are the Pan-European Aggregate and the Asian-Pacific Aggregate Indices. The index also includes Eurodollar and Euro-Yen corporate bonds and Canadian Government securities. **Bloomberg Barclays Global High Yield Index** is a component of the Multiverse Index, along with the Global Aggregate index. It represents the U.S. High-Yield, Pan-European High-Yield, U.S. Emerging Markets High-Yield, CMBS High-Yield, and Pan-European Emerging Markets High-Yield indices. **Bloomberg Barclays U.S. Aggregate Index** represents securities that are SEC-registered, taxable, and dollar denominated. The index covers the U.S. investment grade fixed rate bond market, with index components for government and corporate securities, mortgage pass-through securities, and asset-backed securities. These major sectors are subdivided into more specific indices that are calculated and reported on a regular basis. **Bloomberg Barclays US Treasury Inflation-Linked Bond Index** measures the performance of the US Treasury Inflation Protected Securities (TIPS) market. Federal Reserve holdings of US TIPS are not index eligible and are excluded from the face amount outstanding of each bond in the index. **Bloomberg Barclays U.S. Treasury Index** is a measure of the public obligations of the U.S. Treasury. **Bloomberg Barclays World Government Inflation-Linked All Maturities Bond Index** measures the performance of the major government inflation-linked bond markets. The index is designed to include only those markets in which a global government linker fund is likely to invest. This makes investability a key criterion for inclusion in the index. Markets currently included in the index (in the order of age) are, the UK (1981), Australia (1985), Canada (1991), Sweden (1994), U.S. (1997), France (1998) and Italy (2003). **Bloomberg Commodity Index** is an unmanaged Index composed of futures contracts on a number of physical commodities. The index is designed to be a highly liquid and diversified benchmark for commodities as an asset class. The futures exposures of the benchmark are collateralized by US T-bills. **FTSE National Association of Real Estate Investment Trusts (NAREIT) Equity Index** is an unmanaged market weighted index of tax qualified REITs listed on the New York Stock Exchange, American Stock Exchange and the NASDAQ National Market System, including dividends. **MSCI World ex-USA Index** captures large and mid-cap representation across 22 of 23 Developed Markets (DM) countries, excluding the United States. With 964 constituents, the index covers approximately 85% of the free float-adjusted market capitalization in each country. **MSCI Emerging Markets Index** captures large and mid-cap representation across 27 Emerging Markets (EM) countries. With 1,397 constituents, the index covers approximately 85% of the free float-adjusted market capitalization in each country. **The Russell 3000 Index** is an unmanaged index generally representative of the U.S. market for large domestic stocks as determined by total market capitalization, which represents approximately 98% of the investable U.S. equity market. **S&P 500 Index** is an unmanaged market index generally considered representative of the stock market as a whole. The Index focuses on the large-cap segment of the U.S. equities market. It is not possible to invest directly in an unmanaged index.

**Real Estate** is a custom model is designed to mimic the risk and return characteristics of an investment in levered, private opportunistic real estate based on the corresponding indices from Preqin and Cambridge Associates. Note that historical volatility on illiquid assets is understated as they are not regularly marked to market. **Private Equity** is a custom model where risk factor exposures are estimated through a regression on the Cambridge Private Equity Index. Adjustments are made to equity risk and liquidity consistent with empirical research on private equity managers. Note that historical volatility on illiquid assets is understated as they are not regularly marked to market. **Private Credit** is a custom model that represents an investment in broadly diversified private credit assets. This includes levered and unlevered exposures to residential credit, consumer finance, specialty accounts receivable financing, commercial real estate debt and private corporate lending. Note that historical volatility on illiquid assets is understated as they are not regularly marked to market. **Private Infrastructure** is a custom model is designed to mimic the risk and return characteristics of an investment in private infrastructure. Note that historical volatility on illiquid assets is understated as they are not regularly marked to market. **Custom models:** Models are provided as a proxy for asset classes where a market index is not available and are not intended or generally made available for investment purposes.

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