



## MACRO STRATEGY

### Inflation Q&A Part II:

# What Is the Best Inflation-Hedging Strategy for a Multi-Asset ALM Portfolio?

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### Key Takeaways

- The impact of inflation on assets and liabilities may be different. Therefore, the net exposure of these portfolios may not be a simple sum of two exposures.
- Using Treasury Inflation-Protected Securities (TIPS) alone may not be the best solution to hedge the inflation risk of a multi-asset portfolio.
- Besides TIPS, inflation-sensitive assets (e.g., commodities, real estate, and equity) and inflation derivatives (e.g., inflation swaps and total-return swaps) are the two methods that can be used to mitigate and manage inflation risk. Each instrument has its own unique pros and cons.
- The best strategy is to follow a disciplined framework and develop a customized hedging solution.

After years of a market focus on the risk of disinflation or deflation, inflation has reemerged as a hot topic. There are many inflation-related questions in investors' minds. Here are answers to a few of the most commonly-asked questions.

**Q: Which assets are likely to outperform in an inflationary environment?**

**A:** Based on a historical return analysis (see Table 1), Commodities and Real Estate had higher returns in high-inflation environments than in low-inflation environments. This appears to be mainly due to their strong correlations with inflation. Likewise, Emerging Market economies are tied to commodities, so EM equities tend to benefit from higher inflation when that inflation is associated with higher commodity prices. U.S. Equities and U.S. High Yield Bonds performed better when inflation was moderate, as too much inflation may hurt corporate profit margins, and too little is likely the result of an economic downturn. The U.S. Aggregate Bond Index and the Global Aggregate Bond index also performed relatively better in high-inflation environments, but the differences were not as significant as those of Commodities and Real Estate. Most of the assets performed relative poorly in low-inflation environments, as low inflation is usually associated with lower levels of economic activity. Note that we compared returns by bucketing data using only inflation levels. The economic cycle, index characteristics (e.g., duration and credit rating), and available data history (not including the hyperinflation periods, e.g., 1970s) all would impact the analysis. The definition of Low/Medium/High inflation, as noted in the table, can also alter the return levels. As such, we are mainly focusing on the directions and relationship, rather than the exact return numbers.

**Table 1: One-Year-Rolling Average Returns (01/1981 to 01/2022, Monthly)**

Asset Category	Low (CPI < 1.5%)	Medium ( 1.5%<= CPI<= 2.5%)	High (CPI > 2.5%)
Commodities	-26.5%	-0.3%	17.5%
EM Equities	-6.8%	9.8%	17.3%
Real Estate	2.7%	15.2%	14.8%
U.S. Equities	2.4%	14.8%	10.0%
U.S. HY Bonds	3.8%	11.8%	9.4%
U.S. IG	6.1%	8.7%	9.2%
U.S. Agg. Bonds	5.8%	6.6%	8.6%
U.S. Treasuries	6.0%	6.0%	8.2%
TIPS	2.8%	4.9%	7.6%
Global Agg. Bonds	2.7%	5.8%	6.6%
Cash	0.9%	2.2%	3.3%

Source: Bloomberg, MetLife Investment Management (MIM)

**Q: If the current inflation pressure persists, how should a multi-asset portfolio be positioned?**

**A:** Given the strong performance in high-inflation environments, commodities could be used as a hedge to mitigate inflation risk. Real Estate also deserves a place in a portfolio, as it has historically solid performance in both medium- and high-inflation environments. Diversification is another benefit of including these assets. For equity and credit assets, the solid economic outlook suggests a general overweight toward these assets, with a preference toward floating-rate products over fixed. Treasuries and cash, which typically underperform other assets in inflationary environments, are underweights.

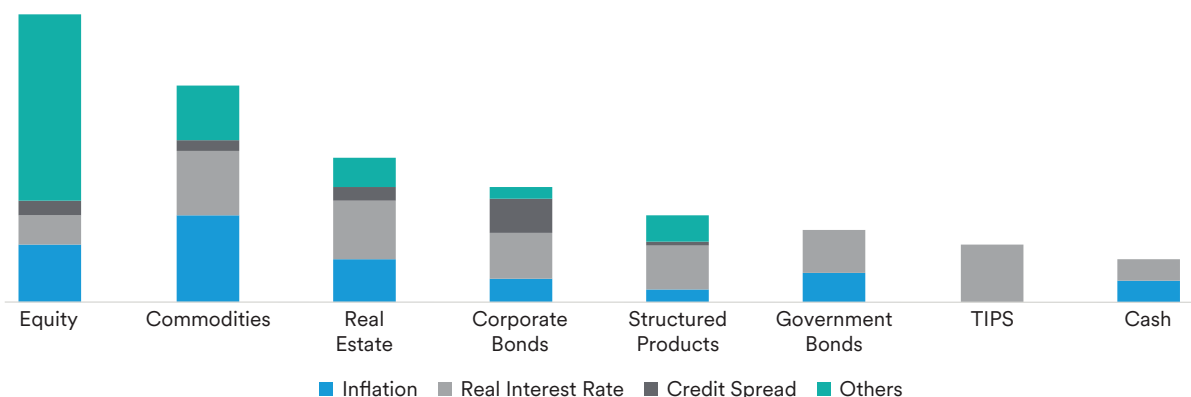
### Q: What assets are exposed to inflation risk?

**A:** Every asset is exposed to inflation risk. Even if you are not an investor, the cash you have saved in a bank and your salary from work will lose their purchasing power when inflation increases. The difference is that some assets (e.g., commodities, real estate, and equity) tend to have better performance in inflationary environments, relative to other assets (e.g., government bonds). For insurance companies and pension funds, liabilities may also be subject to inflation risk. To manage and hedge inflation risk, the net inflation-exposure of assets relative to liabilities needs to be quantified.

### Q: How could net inflation risk-exposure be quantified?

**A:** On the asset side, the total risk of an asset portfolio could be decomposed into risk contributions from its risk factors (such as real interest rates, inflation, equity, foreign exchange, commodities, and volatility). Figure 1 illustrates risk decompositions of different assets. A covariance matrix is used to aggregate all asset risks into portfolio risk-factor contributions. Due to the dynamic nature of asset volatilities and correlations, inflation risk-exposure needs to be re-evaluated periodically, along with changes in portfolio asset allocation. In many cases, stochastic modeling and scenario analysis are needed to better understand risk distribution and tail risk over multiple time periods. On the liability side, differences in accounting and valuation assumptions make evaluating inflation even more challenging. When an insurance liability with direct inflation exposure is priced, an assumption of long-term inflation is made in the liability valuation. In these instances, inflation's impact on the liability valuation would be based on how inflation behaves relative to that assumption. The impacts of short-term inflation dynamics on the asset portfolio and liability portfolio may be different. Therefore, the net exposure of holding both asset and liability portfolios may not be a simple sum of two exposures. A Monte Carlo simulation, which is a mathematical technique to estimate the likelihood of the possible outcomes, may be better suited to evaluate the dynamic relationship between asset and liability portfolios, risk-probability distribution, and tail risk. Calculating net inflation-exposure is the first and most analytically challenging step for inflation hedging.

**Figure 1: Risk Decomposition of Asset Classes based on Risk Factors**



Note: For illustrating the concept only; no actual data was used.

Source: MIM

### Q: Are TIPS the best inflation hedging instrument?

**A:** Treasury Inflation-Protected Securities (TIPS) could be used as a “perfect” hedging instrument if Treasury bonds were the only asset in a portfolio. For a multi-asset portfolio, the efficiency of using TIPS as an inflation hedge diminishes because the inflation sensitivity of an asset portfolio may change over time, and hence, the correlation between TIPS and the inflation exposure of the multi-asset portfolio may change as well. In addition, adding TIPS may increase the portfolio’s interest-rate duration because the value of TIPS is subject to real interest-rate movements. Therefore, using TIPS alone may not be the best solution to hedge the inflation risk of a multi-asset portfolio. Given current low and negative real yields and the solid economic outlook, we would expect commodities to outperform TIPS if high inflation persists through the next couple of quarters.

### Q: What other instruments are available for inflation hedging? What are the pros and cons of using them?

**A:** Besides TIPS, inflation-sensitive assets (e.g., commodities, real estate, and equity) and inflation derivatives (e.g., inflation swaps and total-return swaps) are the two major categories of methods that can be used to mitigate and manage inflation risk. Each instrument has its own unique pros and cons as shown in Table 2. Overweighting inflation-sensitive assets may improve portfolio performance in high-inflation environments. However, it may also increase asset-specific risk exposures that may not be desired. For example, adding/overweighting commodities would increase exposure to geopolitical risks, besides increasing the inflation exposure of the asset portfolio. The advantage of using inflation swaps is that there is no upfront cost, but the value of an inflation swap could be negatively impacted if the realized inflation rate is below the swap’s fixed-payment rate (i.e., inflation expectation). In other words, an inflation swap would only be beneficial if realized inflation exceeds the market’s expectation of inflation rates in the future. A total-return swap, with the underlying being equity or other inflation-sensitive assets, could also be considered as a hedging tool. Note that for all derivative solutions, collateral requirements need to be factored into the total hedging costs.

**Table 2: Pros and Cons of Inflation-Hedging Instruments**

Instruments	Pros	Cons
Inflation-Sensitive Assets	Readily tradable; no premium cost	Increase asset-specific risk exposure
TIPS	Perfect (core) inflation correlation	Exposed to real interest-rate risk
Inflation Swap	No upfront cost	Only benefits when realized inflation exceeds the market-implied rate of inflation; collateral requirements
Total-Return Swap	Immunize the total risk of a particular asset	Collateral requirements

Source: MIM

Note: Table above reflects economic pros and cons and does not consider potential accounting-driven considerations relative to the hedge liability exposure; not all derivatives are liquid enough to be used on a sustained basis.

### Q: What factors need to be considered when formulating an inflation-hedging strategy?

**A:** Table 3 shows some of the key factors that need to be considered. Besides altering the inflation-risk profile, an inflation-risk-hedging action is very likely to alter the risk-and-return profile of the current portfolio, sometimes unavoidably. These factors may be subject to portfolio constraints and requirements. For example, shifting allocations from fixed-income assets to commodities and real estate may be limited by Net Investment Income (NII), ALM, and capital considerations, which may limit the degree of use or permissibility of using all inflation-sensitive assets for hedging. The hedging cost, effectiveness, and rebalancing frequency of an inflation hedge are also very important factors when choosing an inflation-hedging instrument and strategy. The timing of implementing an inflation-hedging strategy is dependent on the stage of the current economic cycle and the current inflation level relative to the portfolio manager's long-term inflation view, and more importantly, relative to any explicit inflation assumptions in liability valuation. If the long-term view on inflation is much lower than the current rate, the portfolio manager may choose not to take any inflation-hedging option, especially when the inflation-hedging cost is high. The best time to put on inflation hedging is when the market's inflation expectations are low. Forecasts and views on interest rates, equity, credit, etc. are critical factors as well. The importance of each factor is determined by portfolio objectives and constraints. All factors need to be considered and balanced. An inflation-hedging strategy should be viewed as part of the portfolio management process and not be treated as a standalone strategy.

**Table 3: Factors That Needed to Be Considered for Developing an Inflation-Hedging Strategy**

#	Factors	Comments
1	Interest Rates	Duration, DV01 limits
2	Asset Turnover	Illiquid assets, difficult to be traded frequently
3	Net Investment Income	Meet business requirements
4	Total Return	Meet or exceed target business requirements
5	Risk Constraints	Credit ratings; value at risk
6	Liquidity	Private asset-weight limits
7	Long-term view on inflation, real interest rates, equity, etc.	One of the most important factors to determine if inflation hedge is needed or not
8	Timing	When market's inflation expectations are low
9	Cost	Trading costs, etc.
10	Effectiveness	The stronger the correlation between inflation and inflation hedge, the higher the effectiveness
11	Dynamic Hedge Frequency	How often need to reevaluate hedge efficiency
12	Capital Requirement	Risk-based capital impact, etc.
...	Other factors and constraints	If applied

Source: MIM



**Q: What Is the best inflation-hedging strategy for a multi-asset ALM portfolio?**

**A:** There is NO best inflation-hedging strategy. Each hedging solution needs to be customized based on the uniqueness of the portfolio's risk-and-return profile, and the inflation exposure and pricing assumptions found in the liabilities. However, we believe that a disciplined analytical framework could be followed:

1. Quantify net inflation risk of both the asset and liability portfolios.
2. Identify all the portfolio objectives and constraints, both qualitative and quantitative.
3. Use a dynamic asset-allocation strategy based on inflation regimes, a derivatives-only strategy, or a combination of both derivatives and dynamic asset allocation.
4. Run optimization and scenario analysis to balance all the constraints and objectives, and achieve optimal hedging effectiveness and cost efficiency.
5. Repeat the steps above, as markets and portfolios change enough to justify another round of the hedging exercise.

The alternative approach may be a 'playbook' type structure: regularly quantify and monitor net inflation exposure (liabilities may be significantly larger than assets, so net short); then, identify specific instruments and entry points that should be considered to mitigate this exposure when the right market-entry points present themselves.

In summary, inflation hedging requires calculating net inflation exposures, evaluating portfolio risk/return profiles and constraints, and balancing the pros and cons of different hedging instruments. Economic views and market timing are critical to achieve optimal hedging effectiveness and cost efficiency. The best strategy is to follow a disciplined framework and develop a customized hedging solution.

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## **Appendix**

This appendix contains details for the preceding charts and provides additional information for greater accessibility.



## Risk Decomposition of Asset Classes based on Risk Factors

### Note:

- Values are approximate
- Looking at the asset classes in the order in which they appear in the table below, the combined risk bars decline fairly fast from Equity to Real Estate and then decline slower from corporate bonds to cash.

### Proportion of Risk in Each Asset Class

Asset Class	Risk: Inflation	Risk: Real Interest Rate	Risk: Credit Spread	Risk: Others
Equity	20%	11%	5%	65%
Commodities	40%	31%	5%	25%
Real Estate	29%	42%	9%	21%
Corporate Bonds	19%	41%	30%	10%
Structured Products	14%	52%	4%	30%
Government Bonds	41%	59%	0%	0%
TIPS	0%	100%	0%	0%
Cash	50%	50%	0%	0%

### Relative Risk for All Asset Classes

Asset Class	Relative Risk
Equity	1.00
Commodities	0.75
Real Estate	0.50
Corporate Bonds	0.40
Structured Products	0.30
Government Bonds	0.25
TIPS	0.20
Cash	0.15