HOW REAL ARE REAL ASSETS?

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PETER MLADINA
Director of Portfolio Research, Wealth Management

JOE BATES
Senior Analyst, Wealth Management Portfolio Research

Inflation erodes purchasing power and can undermine the funding of future goals. Financial markets account for *expected* inflation in asset prices, so expected returns should compensate for inflation on average. *Unexpected* inflation remains a risk.

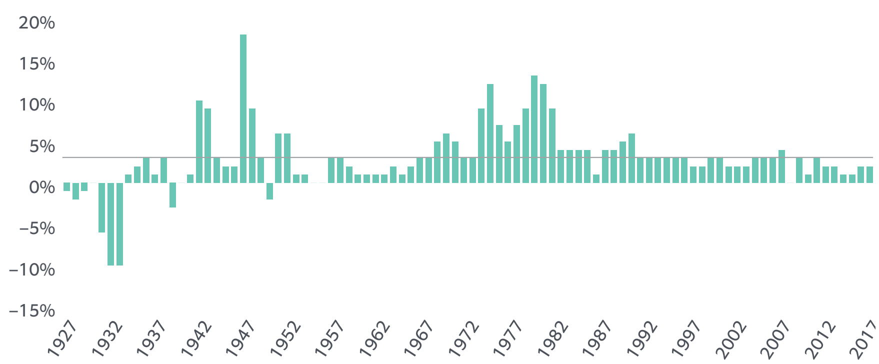
The role of real assets in a portfolio is to improve diversification and protect against unexpected inflation. Real assets include the so-called hard assets of real estate, infrastructure and natural resources, and sometimes Treasury Inflation Protected Securities (TIPS) when the definition of real assets includes inflation mitigation. We examine whether real assets are an effective inflation hedge, and which are the most reliable.

INFLATION OVER THE PAST CENTURY HAS BEEN VOLATILE

The policies of central bankers over the last 30 years have kept inflation relatively stable, but this has not always been the case. Inflation, positive and negative, affects the economy and markets, and reduces the ability to plan for and fund long-term goals. Years of negative inflation (deflation) in the 1930s devastated industry and agriculture, resulting in massive unemployment. Sustained high inflation in the 1970s eroded the standard of living.

Exhibit 1 shows that for most of the last century the annual inflation rate has been very volatile. The long-term average annual inflation rate in the U.S. has been 3.0%, with a standard deviation of 4.0%.

EXHIBIT 1: U.S. INFLATION



Sources: Northern Trust Research, Morningstar.

In contrast, annual inflation has been relatively low and stable over the last 20 years, averaging just 2.1% with a standard deviation of 1.0%. The Federal Reserve has a formal 2.0% target for inflation. This is close to Northern Trust's current five-year inflation forecast of 1.9% and the bond market's breakeven inflation forecast of 2.1% (the difference between the 10-year nominal Treasury bond yield and the 10-year TIPS yield). With years of credit accommodation by the Federal Reserve and the economy running at near-to-full capacity, some investors are concerned that higher inflation could unexpectedly return.

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INFLATION SENSITIVITY OF REAL ASSETS

We evaluate how sensitive the returns of real assets are to changes in inflation to see how they might mitigate a portfolio's inflation risk. We use public indices as proxies for real asset classes,[1] focusing on the last 20 years as the longest common period for assets we wish to examine (with TIPS being the primary limiting factor). Although inflation was relatively low and stable over this period, we find similar overall results when evaluating each asset since its unique inception.

For purposes of our evaluation, it is more informative to look at inflation betas than simple correlations. Correlations measure co-movement but can be affected by many factors. We are interested in one factor – inflation – and an asset's sensitivity (beta) to it. We test quarterly returns because inflation is appraisal-based and there seems to be a valuation lag at shorter frequencies.

Exhibit 2 shows the inflation betas of real assets for the 20 years ending June 2018. The higher the inflation beta, the more strongly the asset return moves with inflation. The t-statistic is an indication of statistical significance: a t-statistic less than 2.0 indicates that the observed beta is indistinguishable from zero and the relationship with inflation is unreliable. A *real,* real asset should have a high inflation beta that is statistically significant. Such an asset would provide more reliable inflation mitigation in a portfolio.

EXHIBIT 2: INFLATION BETAS

	Beta	T-Statistic
60/40 Stock-Bond Portfolio	0.19	0.32
Public Infrastructure	0.15	0.16
Public Real Estate	1.62	1.30
U.S. TIPS	0.64	2.17
Private Real Estate	1.41	2.72
Natural Resources	4.33	3.56
Commodities	5.14	5.72

Sources: Northern Trust Research, Morningstar.

1 Asset classes are represented by MSCI USA Infrastructure, FTSE NAREIT Equity REITs, Bloomberg Barclays US Treasury US TIPS, NCREIF Property Index (private real estate), S&P North American Natural Resources and Bloomberg Commodity indices.

For reference we include the standard 60/40 stock-bond portfolio, which represents commonly held assets.[2] The inflation beta of the 60/40 portfolio is small and insignificant, suggesting a potential role for real assets in a traditional stock-bond portfolio.

The inflation beta of a conventional stock-bond portfolio is small and insignificant, suggesting a role for real assets.

REITS AND INFRASTRUCTURE ARE NOT INFLATION-SENSITIVE

Perhaps counter to conventional wisdom, public infrastructure and real estate investment trusts (REITs) show no reliable inflation sensitivities. Infrastructure has the lowest inflation beta and it is indistinguishable from zero. Although REITs show an inflation beta greater than 1, it is not statistically significant. Testing REIT returns back to 1972, a period that includes a rich inflation history, reveals that the long-term inflation beta and its t-statistic are close to zero. This confirms there is no relationship to inflation and demonstrates why the reliability of the observed inflation beta matters.

TIPS PROVIDE A STRUCTURAL GUARANTEE

TIPS are structurally indexed to inflation. The principal of a TIPS bond adjusts annually in line with upward or downward changes in inflation. TIPS pay interest on the adjusted principal. However, at maturity they pay the larger of the original or adjusted principal, creating a safeguard for investors that limits downward deflationary adjustments. TIPS have a statistically significant inflation beta of 0.64. This moderate beta may be due to the safeguard, as deflation was a real risk during the 2008-2009 global financial crisis. Unfortunately for our analysis, TIPS were not available prior to 1997, so we cannot test TIPS over periods of strong and unexpected inflation. But the inflation adjustment effectively guarantees that TIPS are an inflation hedge for investors who align TIPS to fund multi-year financial goals like lifetime consumption, which we demonstrated in "Risk-free" Goal Funding. From this multi-year, asset-liability perspective, TIPS are the only true inflation hedge, while other inflation-sensitive real assets only mitigate inflation.

PRIVATE REAL ESTATE MAY BE INFLATION-SENSITIVE

We examined private real estate compared to both current and one-quarter lagged inflation, which takes into account the stale pricing of private assets. Both showed statistically significant relationships. These inflation betas are additive and summed to get our total inflation beta. This result indicates that private real estate is inflation-sensitive. However, this finding could be an artifact of appraisal-based pricing because we do not observe the same result in REITs, which own fundamentally the same underlying assets.

2 Standard 60/40 stock-bond portfolio is represented by 60% Russell 3000 and 40% Bloomberg Barclays US Aggregate Bond indices.

NATURAL RESOURCES AND COMMODITIES ARE HIGHLY INFLATION-SENSITIVE

Natural resources and commodities show the most inflation sensitivity in our tests. Their inflation betas are large and statistically significant. The large betas are analogous to leveraged exposure to inflation, where a small allocation in a portfolio can provide inflation protection more broadly across the portfolio.

While the inflation sensitivities of equity-based natural resources and futures-based commodities are similar, natural resources investments earn an equity return premium while diversified, long-only commodity futures earn a collateral return (T-bills) with a lot of uncompensated volatility. Futures contracts are not capital assets, so they have no clear expected return beyond the collateral yield. For this reason we would prefer an allocation to natural resource equities.

TIPS and natural resources may be the best tools to protect against unanticipated inflation.

THE BEST PROTECTION AGAINST UNEXPECTED INFLATION

Unexpected inflation can undermine the successful funding of future goals. The role of real assets in a portfolio is to provide diversification and mitigate inflation risk. We found that not all real assets are so real, at least when considering inflation sensitivity. For investors looking to protect a portfolio against the risk of unanticipated inflation, TIPS and natural resources may be your best tools.

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