MORNINGSTAR®

Keeping Ahead of Inflation with the Morningstar® Real Asset Index℠

Vikash Punglia, CFA
Senior Manager, Morningstar Indexes

Paul D. Kaplan, CFA, Ph.D
Director of Research, Morningstar Canada

Morningstar Research Paper
January 2, 2013

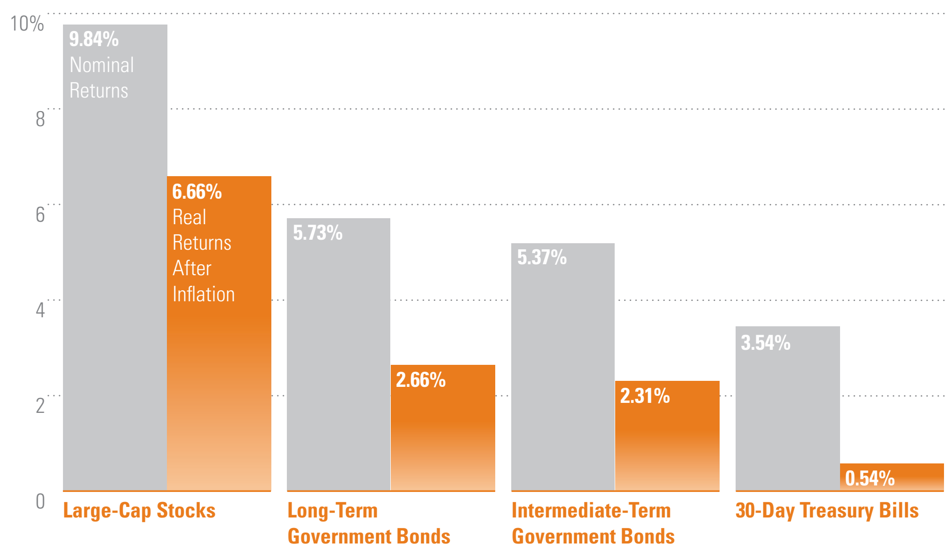
Inflation Risk

Investors can easily fail to prepare for the risk of inflation eroding the purchasing power of money, especially in a low-inflation environment. Thus it is wise for investors' portfolios to include assets that provide some protection against unexpected inflation. The old saying, "The time to buy insurance is when you don't need it," applies to inflation risk, just as any other risk.

The past few years of declining interest rates and low inflation have been a pleasant surprise for both stockholders and bondholders. However, the sustainability of this trend is questionable. A variety of issues are causing concern among investors trying to preserve their real wealth, including rising commodity prices, rapid economic growth and resource use in emerging markets, ultra-loose monetary policy in developed markets, and social and political unrest in resource-rich countries around the world. The prospect of higher inflation affects investors because the higher the inflation rate, the faster the value of their savings erodes.

Exhibit 1 shows the returns before and after inflation for U.S. stocks, bonds, and cash over the period January 1926–November 2012. Notice that cash and bonds, after adjusting for inflation, barely kept pace with the rise in prices over the past 87 years. If investment returns do not keep up with inflation, portfolio values will purchase less in the future (when they are needed) than at the time of investment. Investors looking to maintain their standard of living may need to consider investments that offer greater potential to outpace inflation.

Exhibit 1: **Compound Returns Before and After Inflation** 1926–2012

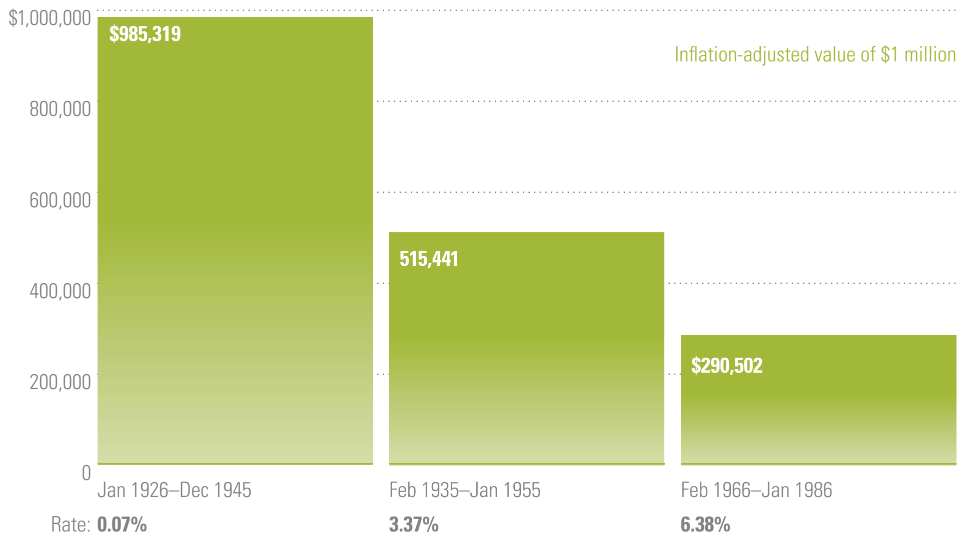


Sources: Morningstar (2012), Morningstar EnCorr.

Overlooking Inflation Can Be Costly

It's easy to overlook inflation, especially as it hasn't been at alarming levels recently. (It was as low as 0.1% in 2008, 1.5% in 2010, and 2.5% over the first 11 months of 2012.) Yet historically, inflation has reduced purchasing power quite significantly over longer time periods. Exhibit 2 illustrates this by showing the inflation-adjusted (real) value of $1 million over various 20-year periods.

Exhibit 2: **Inflation-Adjusted Values of $1,000,000 Over Various 20 Year Periods**



Sources: Morningstar, Morningstar EnCorr.

The Morningstar® US Real Asset Index℠

We typically think of real assets as physical or tangible assets. Under this definition, real assets include physical commodities and real estate. Such physical assets are typically illiquid, so we broaden our definition of "real assets" to securities that are strongly related to physical assets. Because a primary investment purpose of real assets is to provide insurance against unexpected inflation, we further broaden our definition to include inflation-linked bonds such U.S. Treasury Inflation-Protected Securities, or TIPS.

For the purpose of constructing a U.S. real asset index, we define "real assets" to include TIPS, commodity futures-based strategies, Real Estate Investment Trusts (REITs), and inflation-sensitive equities such as upstream commodity stocks and Master Limited Partnerships (MLPs). The Morningstar® US Real Asset Index℠ consists of various indexes that each track the following asset classes or strategies.

Treasury Inflation-Protected Securities (TIPS)

In the U.S., the Treasury originally offered TIPS to give investors a means to protect their bond returns from inflation. These securities, unlike other government bonds, are tied to an inflation index—the consumer price index (CPI). Both coupon payments and final principal payments are adjusted to account for inflation, thus offering investors a potentially stable real rate of return over the life of the bond. We represent U.S. TIPS with the Morningstar® US Treasury Inflation-Protected Securities Index.℠

Commodity Futures Strategies

Because physical commodity prices tend to increase in periods of inflation, there has been much interest in strategies linked to commodity prices. It is generally impractical to directly invest in physical commodities, so strategies that use commodity futures have garnered the most attention and acceptance as a means of commodity investing. Yet as Kaplan (2010) argues, the popular long-only commodity indexes do not reflect the way that commodity futures strategies are or should be managed. Instead, he advocates a momentum-based long/short strategy that can be implemented in an index product. In constructing our real asset index, we follow Kaplan's approach by using the Morningstar® Long/Short Commodity Index℠ for the commodity component.

Real Estate Investment Trusts (REITs)

Real estate investment trusts are companies that own, manage, and lease investment-grade, income-producing commercial real estate. In the U.S., REITs must have at least 75% of assets in real property and at least 75% of revenue must come from real estate. To maintain the REIT tax designation and benefit from lower corporate income taxes (the company receives a dividends-paid deduction), REITs are required to distribute 90% of their taxable income to shareholders. We use the Morningstar® US REIT Index℠ to represent the REIT component of our real asset index.

Commodity Stocks

The final component of our real asset index consists of stocks in companies whose primary businesses are directly related to the production of commodities. We use two types of stocks for this: upstream commodity equities and MLPs. We weigh these components in a 2-to-1 ratio in our index.

Upstream Commodity Equities

Upstream commodity producers are companies directly involved in extracting or harvesting natural resources and thus are highly affected by changes in the commodities market. As a result, returns on upstream producer stocks should be highly correlated to the underlying commodity spot prices. We represent upstream commodity equities with the Morningstar® Global Upstream Natural Resources Index.℠

Master Limited Partnerships (MLPs)

The MLP structure was created by Congress in 1986 to encourage investment in natural resources. Master limited partnerships engage in the transportation, treating, processing, refining, storage, marketing, exploration, and production of natural resources. MLPs' assets—particularly pipelines but also gathering systems, storage assets, and processing facilities—tend to enjoy partial structural monopolies that allow operators to earn above-average returns on capital. Master limited partnerships are pass-through entities that allocate income, losses, gains, and deductions to limited partners. Master limited partnerships do not pay corporate income tax, so investors avoid the double taxation inherent in corporations. Returns on MLPs tend to benefit from inflation. We represent MLPs in the Morningstar® MLP Composite Index.℠

Construction of the Morningstar® US Real Asset Index℠

We designed the Morningstar® US Real Asset Index℠ to be a diversified portfolio of inflation-linked bonds, commodity futures, REITs, and commodity-related stocks. The index gives investors access to real assets in a transparent, rules-based, and cost-effective manner. Our design objectives included inflation sensitivity, diversification, an attractive risk/return profile, low correlation with equity and fixed-income assets, and liquidity.

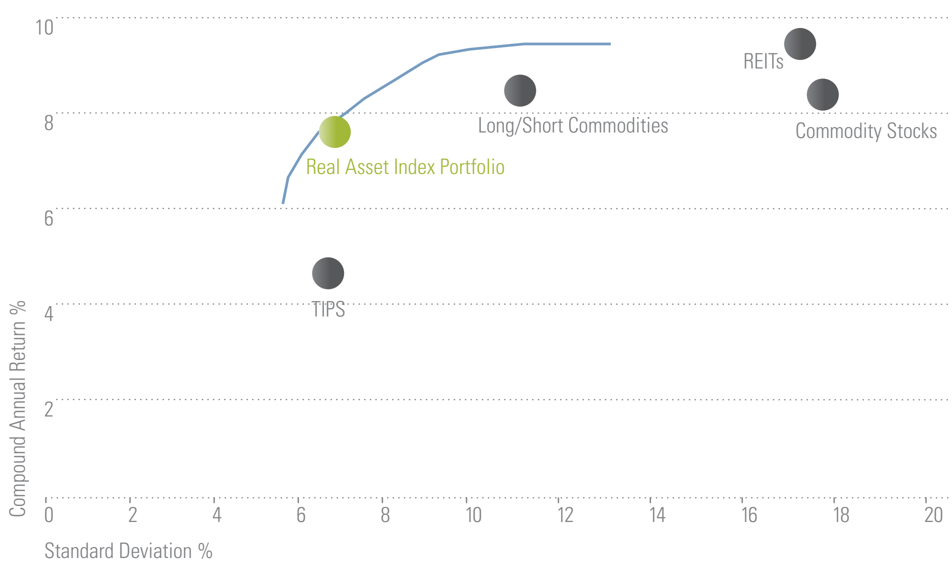
To achieve these objectives, we form a fix-weighted portfolio of the underlying indexes using historical inflation-adjusted (real) monthly total returns as a guide. Our historical period is January 1980–November 2012. Because the Morningstar® Long/Short Commodity Index℠ only has a history back to January 1980, we back-filled the remaining Morningstar indexes with data from other sources. (See the Appendix for details.)

An objective of the index is to provide attractive inflation-adjusted, risk-adjusted performance, so we perform all of our analysis on inflation-adjusted monthly returns using the inflation series presented in Morningstar 2012. Exhibit 3 shows an historical efficient frontier of annualized standard deviation and compound annual real total return for the index components, as well as a portfolio that we constructed as the basis for the index from the following asset classes:

- TIPS (40%)
- Long/Short Commodities (30%)
- REITs (15%)
- Commodity Stocks (15%)

Exhibit 3 shows that this portfolio has had an attractive combination of risk and return in real terms over a 32-year period and thus fulfills the inflation-adjusted risk and return objectives of the Morningstar® US Real Asset Index.℠ The only major difference between the portfolio shown here and the actual index is that, to limit turnover, the index is rebalanced semiannually rather than monthly.

Exhibit 3: **Historical Real Return Efficient Frontier of U.S. Real Asset Index Components**
January 1980–November 2012



Sources: Morningstar Indexes, Chen and Terrien (2001), NAREIT, Ken French's website, Morningstar (2012), Morningstar EnCorr.

Results in Comparison to U.S. Stocks, Bonds, and Treasury Bills

We developed the Morningstar® US Real Asset Index℠ to complement a portfolio of U.S. stocks, bonds, and cash. Exhibit 4 presents summary statistics on the index, U.S. stocks, bonds, and cash using standard indexes, along with the four component indexes for the period January 1980–November 2012. We also show results for the traditional 60/30/10 mix of stocks, bonds, and cash. Over this period, the real asset index actually outperformed the other asset classes and did so with bond-like risk levels. While we would not expect this outperformance to be repeated in the future, we would expect the index to continue to provide a medium level of risk and outpace inflation. We would also expect it to continue to provide opportunities to diversify with stocks, bonds, and cash as evidenced by the moderate correlations that it showed over the period with these asset classes, shown in Exhibit 5.

Exhibit 4. **Summary Statistics on Real Returns on U.S. Asset Class Indexes**
January 1980–November 2012

	Compound Annual Return %	Annualized Standard Deviation %	Monthly Sharpe Ratio	Maximum Drawdown %
Morningstar® US Real Asset Index℠	**7.69**	**6.96**	**0.27**	**-19.58**
S&P 500	7.54	16.90	0.13	-54.00
Barclays US Aggregate Bond	5.00	6.16	0.18	-19.33
30-Day Treasury Bills	1.54	1.26	—	-8.88
TIPS	4.81	6.64	0.16	-21.48
Long/Short Commodities	8.53	11.44	0.20	-22.46
REITs	8.49	18.80	0.14	-69.22
Commodity Stocks	9.52	18.41	0.16	-46.19
60/30/10 Portfolio	6.47	10.54	0.16	-33.81

Sources: Morningstar Indexes, Chen and Terrien (2001), NAREIT, Ken French's website, Morningstar (2012), Barclays, Morningstar Encorr.

Exhibit 5: **Correlations of Real Returns on U.S. Asset Class Indexes**
January 1980–November 2012

Index	1	2	3	4	5	6	7	8	9
1. Morningstar® US Real Asset Index℠	1.00								
2. S&P 500	0.58	1.00							
3. Barclays US Aggregate Bond	0.41	0.22	1.00						
4. 30-Day Treasury Bills	0.11	0.11	0.38	1.00					
5. TIPS	0.57	0.23	0.81	0.16	1.00				
6. Long/Short Commodities	0.50	-0.06	-0.02	0.08	0.02	1.00			
7. REITs	0.63	0.59	0.15	0.03	0.23	-0.11	1.00		
8. Commodity Stocks	0.72	0.77	0.10	-0.02	0.20	0.10	0.54	1.00	
9. 60/30/10 Portfolio	0.62	0.98	0.39	0.18	0.36	-0.06	0.58	0.74	1.00

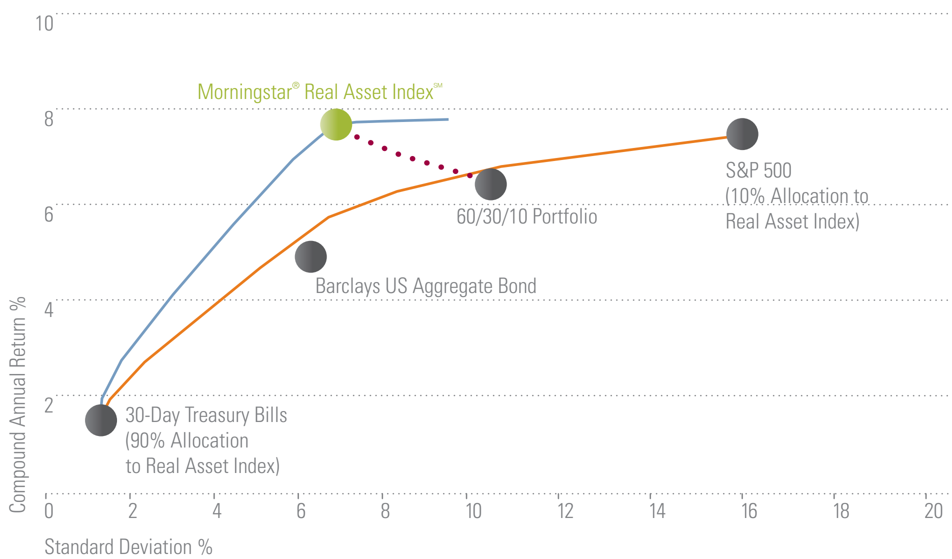
1.00 to 0.61	0.60 to 0.21	0.20 to -0.20	-0.21 to -0.60	-0.61 to -1.00
Extreme Positive	**Positive**	**Moderate**	**Negative**	**Extreme Negative**

Sources: Morningstar Indexes, Chen and Terrien (2001), NAREIT, Ken French's website, Morningstar (2012), Barclays, Morningstar Encorr.

The Morningstar® Real Asset Index℠ as a Portfolio Component

Exhibit 6 shows two historical efficient frontiers of annualized standard deviation and compound annual real total return for the period January 1980–November 2012. One frontier is for U.S. stocks, bonds, and cash. It also shows how the 60/30/10 portfolio of these three asset classes is close to this frontier. The other frontier includes the Morningstar® US Real Asset Index℠ as a fourth asset class. The gap between the frontiers illustrates the opportunities to reduce risk and increase return by blending the real asset index with the conventional asset classes. In particular, the exhibit includes the curve formed by blending the 60/30/10 portfolio with the real asset index in 10% increments. This illustrates how the index can be used in conjunction with a conventional asset mix to improve the risk/return prospects of a portfolio on an inflation-adjusted basis.

Exhibit 6: **Historical Real Return Efficient Frontiers of U.S. Asset Classes**
January 1980–November 2012



Source: Morningstar

Conclusion

Trying to predict inflation may be a futile exercise, but this does not mean that investors should design their portfolios without any cognizance of inflation risk. Stocks and bonds may fail to deliver real returns in an inflationary environment, but real assets and assets explicitly linked to inflation can mitigate this problem and offer much in terms of diversification, lower risk, and more efficient portfolio design.

A prudent approach that adds inflation sensitivity to a portfolio is to invest in a diversified portfolio of real assets (broadly defined) such as inflation-linked bonds, commodities, REITs, and commodity-related stocks. This holistic approach allows investors to harvest real returns with lower risk and maintain a portfolio that holds its value even in the face of inflation. Diversification still remains the only "free lunch" in finance, and investors especially who are exposed to inflation risk will be well served by including real assets in their portfolio mix.

The Morningstar® US Real Asset Index℠ can help investors control their exposure to inflation through built-in inflation sensitivity, diversification, an attractive risk/return profile, and moderate correlation with stocks and bonds. Products linked to the Morningstar® US Real Asset Index℠ could offer investors a transparent, rules-based and cost-effective access to a diversified portfolio of liquid, inflation-sensitive assets.

Appendix: Back-Filling Results

TIPS

For the period January 1980–December 1998 we back-filled the Morningstar® US TIPS Index℠ with the Ibbotson Synthetic TIPS Return Series developed by Chen and Terrien (2001).

REITs

For the period January 1980–December 1997 we back-filled the Morningstar® US REITs Index℠ with the NAREIT U.S. Equity REIT Index.

Commodity Stocks

For the period January 1980–June 2000, commodity stocks are 100% upstream commodity equities. Starting in July 2000, commodity stocks are a two-thirds/one-third blend of upstream commodity equities and the Morningstar® US MLP Composite Index℠.

For the period January 1980–December 2000, we back-filled the Morningstar® Global Upstream Natural Resources Index℠ with the following portfolio of industry indexes published by Ken French on his website:

- Oil (24%)
- Agriculture (22.5%)
- Mines (15%)
- Steel (12%)
- Utilities (10%)
- Chemicals (7.5%)
- Coal (6%)
- Gold (3%)

References

- Chen, Peng and Matt Terrien. 2001. "TIPS as an Asset Class." Journal of Investing. Summer.
- Kaplan, Paul D. 2010. "The Long and Short of Commodity Indexes," Journal of Index Investing. Summer.
- Morningstar Inc. 2012. Ibbotson Stocks, Bonds, Bills, and Inflation (SBBI) Classic Yearbook. Morningstar, Inc.