Vanguard®

TIPS: Inflation protection still has risks

Vanguard research

September 2012

Executive summary. Treasury Inflation Protected Securities (TIPS)[1] have become increasingly popular as a guard against the prospect of rising inflation in the U.S. economy. In the three years ended June 30, 2012, TIPS mutual funds garnered about $42 billion in net cash flow ($11 billion in the final 12 months alone).[2] The three-year cash flow represented just under 50% of the net cash flow received by TIPS funds in the ten years through June 2012.[3] Over this same period, real (inflation-adjusted) yields declined to the point that a recent auction of a 5-year TIPS bond offered a real yield of –1.08%. The fall in real yields has led to high returns for TIPS (10% per year for the three years through June 2012 and 12% in just the last year of that period),[4] which seems to have further fueled investor interest in TIPS.

Authors

Scott J. Donaldson, CFA, CFP®

Christopher B. Philips, CFA

David J. Walker, CFA

1 Unless otherwise noted, when we mention TIPS, we are referring to the TIPS market or broadly diversified TIPS mutual funds and ETFs.

2 TIPS were first issued in January 1997 by the U.S. Treasury. As of June 30, 2012, they had an approximate market value of about $796 billion, which equates to approximately 12% of the Treasury market. Of this amount, a bit more than $138 billion was invested across various mutual funds.

3 Sources: Barclays and Morningstar, Inc.

4 Source: Barclays U.S. TIPS Index as of June 30, 2012.

Vanguard firmly believes that TIPS can play a valuable role as part of a broadly diversified portfolio. However, Vanguard also reminds investors that the broad TIPS benchmark—the Barclays U.S. Treasury Inflation Protected Securities Index—possesses high interest rate risk (i.e., high portfolio duration). Given existing low or even negative real yields and relatively high interest rate sensitivity, TIPS investors face risks today that should be carefully evaluated.

For long-term investors, TIPS can play a valuable role in a portfolio, given TIPS' embedded relationship to inflation. The U.S. Treasury adjusts TIPS' principal periodically to reflect reported changes in the Consumer Price Index for Urban Consumers (CPI-U).[5] For investors concerned about inflation, TIPS' returns have historically demonstrated a positive correlation to inflationary surprises, or "unexpected inflation."

However, despite oft-discussed inflation fears due to the actions of the U.S. Federal Reserve following the global financial crisis, realized inflation has remained tame. Forward-looking metrics represented by the 5- and 10-year break-even rates of inflation (BEI)[6] have also stayed within a range of about 1%–2.5%.[7] This is critical for investors to understand, because the BEI reflects all investors' collective expectations about future expected inflation. *Investors who are increasing their allocation to TIPS today are therefore accepting minimal compensation, and are forgoing the inflation risk premium associated with nominal Treasury bonds for the expectation of positive real returns.*

Although TIPS adjust principal for changes in CPI-U, such protection comes with exposure to interest rate risk (as with any bond investment). Because many TIPS in the current market are debt securities of longer maturity, they are subject to price volatility and loss (sometimes significant) resulting from unexpected changes in investor concerns about inflation, changes in real interest rates, or other factors in the market or economy. For instance, as highlighted in **Figure 1**, as real yields increase (or decrease), the total return of TIPS would be expected to decrease (or increase).

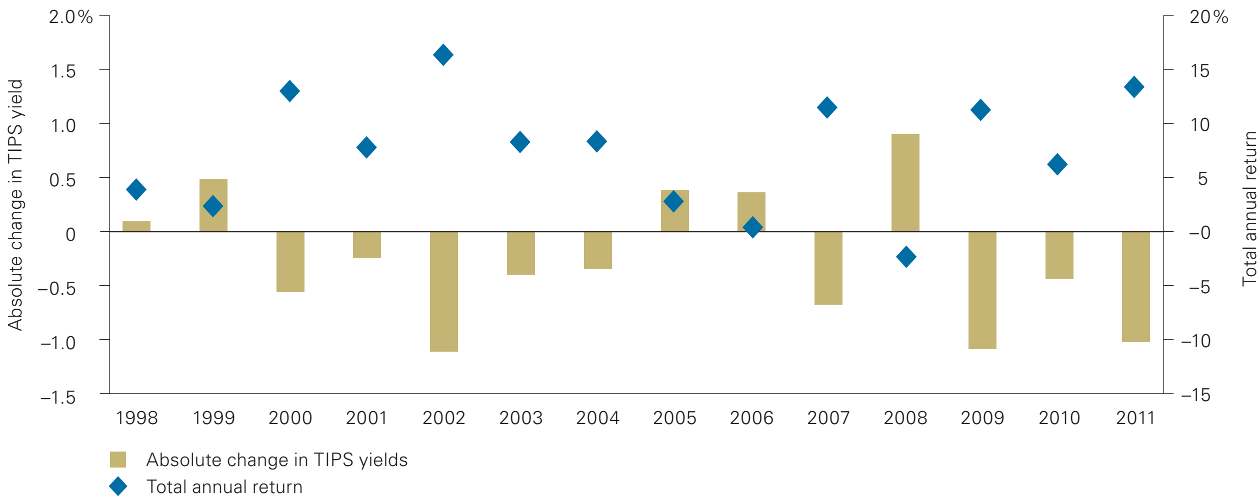
Notes on risk: All investments are subject to risk. Past performance is no guarantee of future returns. Investments in bonds are subject to interest rate, credit, and, for nominal bonds, inflation risk. While U.S. Treasury or government-agency securities provide substantial protection against credit risk, they do not protect investors against price changes due to changing interest rates. Unlike stocks and bonds, U.S. Treasury bills are guaranteed as to the timely payment of principal and interest. Diversification does not ensure a profit or protect against a loss in a declining market. The performance of an index is not an exact representation of any particular investment, as you cannot invest directly in an index.

5 An investor who holds an individual TIPS to maturity is more truly inflation-hedged for that specific time horizon than a TIPS fund investor for the same period. This is because of the real interest rate risk associated with the fund, which does not pay inflation-adjusted principal back on a set maturity date.

6 Break-even inflation is the difference between the yields of a nominal Treasury bond and a similar-maturity TIPS bond. The BEI rate represents not only the bond market's expectation of future inflation over the life (or maturity) of the bonds but also risk premiums that reflect the uncertainty about future inflation and the relative liquidity of the two bonds.

7 For further discussion on the influence of the break-even rate of inflation on TIPS' returns, see Wallick and Marshall (2009).

Figure 1. Changes in real yields and TIPS' total returns: 1998–2011



Note: Annual changes in real yields and total returns represented by Barclays U.S. TIPS Index.

Sources: Vanguard and Barclays.

Figure 2. TIPS' risk of loss: March 1997–June 2012 (monthly data)

TIPS' risk of loss (3/1997–6/2012 monthly data)	Nominal	Real
Worst monthly return	–8.69%	–7.76%
Worst rolling 12-month return	–7.50	–8.10
Worst rolling 36-month annualized return	1.64	–1.15
Best monthly return	5.84	6.06
Best rolling 12-month return	19.56	17.40
Best rolling 36-month annualized return	13.65	10.83

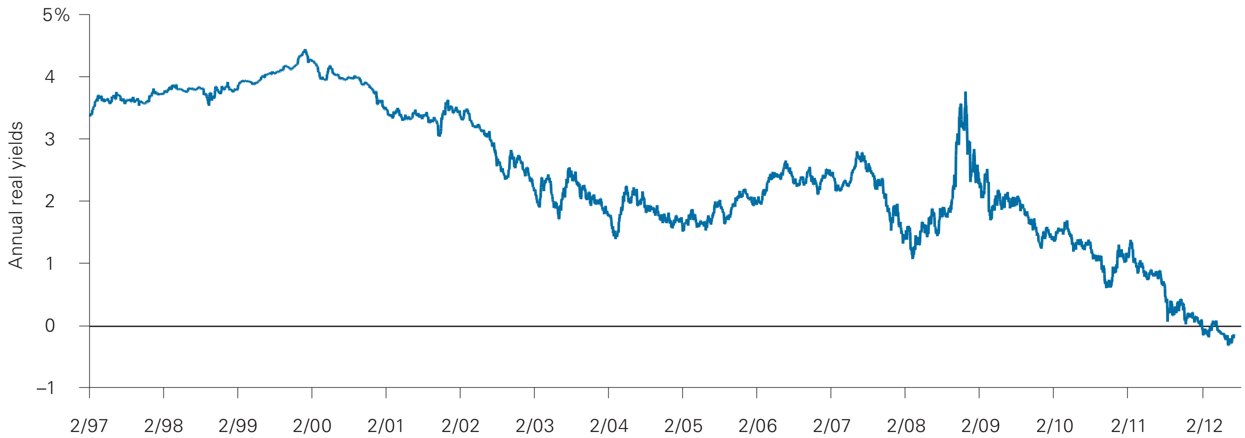
Note: TIPS' benchmark returns in the United States began in March 1997.

Sources: Vanguard and Barclays.

As Figure 1 shows, for the period 1998–2011, as real yields fell, total returns were positive. In the few instances since the introduction of TIPS in which real yields rose (for instance, 2008), TIPS' total returns were lower or even negative. **Figure 2** expands on Figure 1's data by showing the best and worst monthly, rolling one-year, and rolling three-year annualized returns for TIPS. Even though, historically, over a longer period such as three years, real returns were slightly negative in a worst-case scenario, the downside was much less than over shorter periods. As the time period lengthens, the inflation adjustments contribute more to the average total return, helping to offset short-term movements and reducing the likelihood that an investor will receive a negative real return. For instance, since March 1997, only 3% of the monthly rolling three-year real returns were negative, compared with 16% of the monthly rolling one-year returns.

Figure 3. Real yields today don't provide the same income cushion

Historical real yields for Barclays U.S. TIPS Index



Note: Historical real yields represented by Barclays U.S. TIPS Index from February 28, 1997, through June 30, 2012.
Sources: Vanguard and Barclays.

One critical component of the marginally positive total returns in prior years when real yields rose was the income cushion that helped to mitigate the impact of price declines. For example, **Figure 3** shows that for most of TIPS' history through June 30, 2012, investors collected a real yield of at least 2%. Today, however, that yield cushion is gone, negating the mitigating impact on price volatility.

In addition, today's very low real yields influence the sensitivity of TIPS to real interest rate movements. Duration plays a key role in the volatility of TIPS as well as nominal bonds. The longer the duration of a bond portfolio, the greater the sensitivity to changes in yields. **Figure 4** highlights the fact that the historical average duration (real) for the broad TIPS market has been about 8–9 years, which is where it is today. This duration falls between the durations of the Barclays 5–10 Year Treasury Bond Index and the Barclays U.S. Long Treasury Bond Index.[8] However, historically, the broad TIPS market has experienced volatility similar to that of the Barclays 5–10 Year Treasury Bond Index. The similar average volatility, despite the slightly longer duration for the TIPS benchmark, is due to the fact that changes in real yields, which affect TIPS, are less volatile than changes in nominal yields, which affect nominal bonds.[9] These volatility data further underscore that TIPS can be risky, and especially so with today's razor-thin (or negative) real yields contributing to higher durations.

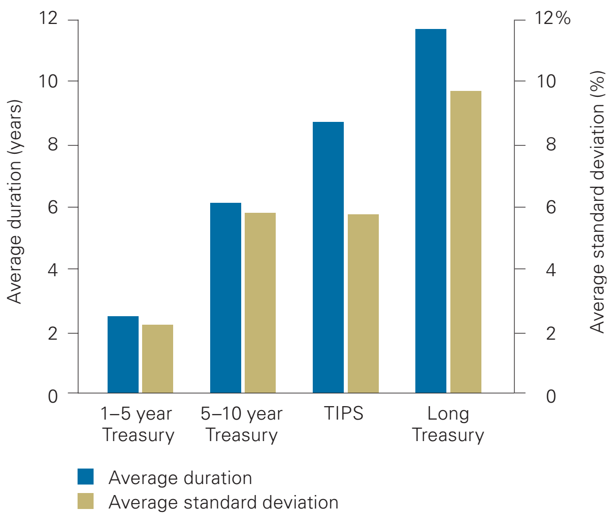
Conclusion

Like conventional Treasury bonds, TIPS can decline in value over any short-term period. In other words, investors should not view a TIPS portfolio as a risk-free inflation hedge. Considering that the best long-term predictor of bond returns is the starting yield, with TIPS real yields near zero today, the

8 The real duration of the TIPS benchmark is higher than that of the Barclays 5–10 Year Treasury Bond Index because the Barclays U.S. Government Inflation-Linked All Maturities Bond Index contains securities that have a broad range of maturities, including some that are much longer.

9 The average volatility of monthly real yields, represented by a constant-maturity 10-year U.S. TIPS bond, was lower than the average volatility of monthly nominal yields, represented by a constant-maturity 10-year U.S. Treasury nominal bond, from January 2003 through May 2012.

Figure 4. Duration and standard deviation of Treasury securities: March 1997–June 2012



Notes: Benchmarks used were the Barclays 1–5 Year Treasury Bond Index, the Barclays 5–10 Year Treasury Bond Index, the Barclays U.S. Government Inflation-Linked All Maturities Bond Index, and the Barclays U.S. Long Treasury Bond Index. Standard deviation is annualized.

The Barclays U.S. Government Inflation-Linked All Maturities Bond Index data reflect real duration because TIPS volatility is affected by moves in real interest rates. However, data for the Barclays 1–5 Year Treasury, 5–10 Year Treasury, and Long Treasury Bond Indexes are nominal duration (non-inflation-adjusted) because nominal bonds' volatility is influenced by changes in nominal interest rates (non-inflation-adjusted).

Sources: Vanguard and Barclays.

long-term expected *real* return of TIPS would also be near zero. From a nominal return standpoint, if current break-even rates of inflation between 10-year TIPS and 10-year nominal Treasuries are about 2%–2.5%, adding that inflation expectation to the zero real-return expectation puts the long-term expected nominal return of TIPS at 2%–2.5%, unless there is a significant upward or downward movement in inflation. Those expectations are much lower than past returns.

Investors should consider TIPS as a long-term investment to mitigate the impacts of unexpected and high inflation. As with most investments, the short-term performance of TIPS, both positive and negative, is an unreliable basis for long-term return expectations. Given the current low-yield environment, the return outlook for TIPS (as with most U.S. bond investments today) is muted and likely to be more volatile than in the past. Nevertheless, the strategic case for bond diversification remains strong—including that for TIPS—given the uncertainty of the future inflation outlook.

References

Bennyhoff, Donald G., 2009. *Preserving a Portfolio's Real Value: Is There an Optimal Strategy?* Valley Forge, Pa.: The Vanguard Group.

Campbell, John Y., Robert J. Shiller, and Luis M. Viceira, 2009. *Understanding Inflation-Indexed Bond Markets,* NBER Working Paper No. 15014. Cambridge, Mass.: National Bureau of Economic Research.

Dektar, Daniel C., 2005. ABCs of TIPS. CFA Institute Conference Proceedings. *Fixed-Income Tools for Enhancing Returns and Meeting Client Objectives* (February): 43–51.

Hammond, P. Brett, 2002. *Understanding and Using Inflation Bonds.* TIAA-CREF Institute, No. 73 (September); available at www.tiaa-crefinstitute.org.

Vanguard Group, The. *Investing in Treasury Inflation Protected Securities,* 2006. Valley Forge, Pa.: The Vanguard Group.

Wallick, Daniel W., and Jill Marshall, 2009. *TIPS and the Nature of Inflation Protection.* Research Note. Valley Forge, Pa.: The Vanguard Group.

P.O. Box 2600
Valley Forge, PA 19482-2600

Connect with Vanguard® > vanguard.com

Vanguard research >
Vanguard Center for Retirement Research
Vanguard Investment Counseling & Research
Vanguard Investment Strategy Group

E-mail > research@vanguard.com

For more information about Vanguard funds, visit vanguard.com, or call 800-662-2739, to obtain a prospectus. Investment objectives, risks, charges, expenses, and other important information about a fund are contained in the prospectus; read and consider it carefully before investing.

ICRTIPS 092012