

ECONOMIC COMMENTARY

Federal Reserve Bank of Cleveland

TIPS for Safer Investing

by Kevin H. Sargent and Richard D. Taylor

Inflation—a persistent increase in the price level—threatens people's financial well-being by reducing the purchasing power of money, cutting into the future value of savings, and, when unexpected, lowering the real rate of return on investments.¹ To protect their holdings, people take great pains to find investments whose returns exceed the inflation rate, such as stocks, bonds, and numerous other financial instruments. But when their returns are corrected for inflation, investors often see negative numbers.

Prominent economists such as Milton Friedman, James Tobin, and Stanley Fischer have long endorsed the idea of indexing government securities to changes in the price level.² But even as Great Britain, Canada, Australia, and Sweden were doing just that, the U.S. Treasury remained reluctant to follow suit—until last year.

On May 16, 1996, the Treasury Department made financial history by announcing its intention to issue the first U.S. securities indexed to the rate of inflation. Dubbed Treasury Inflation-Protection Securities (TIPS), the indexed bonds were first auctioned on January 29, 1997. Now, U.S. investors and savers can purchase a financial instrument that provides a guaranteed hedge against the loss of purchasing power that accompanies increases in the Consumer Price Index (CPI).³

The Treasury's about-face on TIPS was motivated by its desire to broaden the choice of debt instruments available to the American public and to reduce the Treasury's borrowing costs.⁴ Although most professionals in the investment community and academia appear to back the Treasury's decision, their support stems almost entirely from the belief that TIPS will fill an important niche in American investors' portfolios. Considerable disagreement exists about the Treasury's ability to reduce its borrowing costs.

This *Economic Commentary* reviews TIPS' key structural features and discusses some of their advantages and disadvantages relative to other investment alternatives. It also looks at the potential benefits to the Treasury. When all of these elements are weighed, it is clear that TIPS are a much-needed financial innovation that will help investors protect themselves against the negative effects of inflation.

■ A Review of TIPS' Structure

TIPS are structured similarly to the real-return bonds currently issued in Canada. The value of the principal is adjusted for inflation each day, using changes in the CPI as a benchmark.⁵ Every six months, a fixed-rate coupon is issued, with its payment based on the revised principal amount. The Treasury is currently issuing TIPS on a quarterly basis and uses a single-price auction to determine the fixed-rate coupon on each new issue.⁶

Treasury Inflation-Protection Securities, or TIPS, are the first U.S. government securities guaranteed to provide riskless, long-term protection against unexpected inflation. Benchmarked against changes in the Consumer Price Index, TIPS should attract various types of investors, including those who do not want to risk their money in the stock market, those who need to draw on their investment while preserving their principal, and small investors who might not otherwise be able to shelter their savings from inflation's ill effects.

A TIPS principal grows at the same rate as inflation; thus, it maintains its real value in terms of the market basket of goods that make up the CPI. The fixed-rate coupon also rises in proportion to the increase in the principal. If deflation occurs, the principal is adjusted down in accordance with the falling CPI, as is the coupon payment. It is possible, then, that the coupon could pay on a principal amount less than par (the stated value of the security at issuance). The principal is returned to the investor upon maturity, fully adjusted for inflation (or deflation). However, if deflation reduces the principal below par, the investor will still receive par back from the Treasury.⁷

In contrast to TIPS, standard Treasury securities have a fixed principal amount and a fixed coupon payment. The investor receives a biannual coupon payment, which is based on the fixed principal. When a standard Treasury security matures, the investor receives par, or the face value of the bond. The Treasury intends to continue issuing TIPS in several maturities ranging from one to 30 years.⁸

■ Limited Alternatives

It is generally agreed that investors and savers benefit from having more financial instruments at their disposal. Although returns on TIPS are expected to be lower than on traditional Treasury securities, many economists believe that there is a group of people who will gladly forgo a higher rate of return for the guarantee that their savings will keep pace with inflation.

Before TIPS became available, hedging against the risk of changes in the price level meant assuming other risks. Small investors found it costly to obtain the proper diversification to hedge against inflation once management and brokerage fees were added in, and even then there was no guarantee of full protection from its effects.

Residential property is sometimes considered an effective inflation hedge, but it is not tied directly to the CPI and is not affordable for some investors. Gold and other commodities are also imperfect hedges because they, too, do not precisely mirror the CPI.

Stocks are considered very poor protection against a rising price level, because higher prices tend to bring about lower nominal and real yields.⁹ Stock market fluctuations complicate matters because a market downturn can occur at the same time an investor needs his money. Rolling over short-term Treasury bills is generally believed to provide an adequate hedge against inflation, but this exposes the investor to fluctuations in the real interest rate.¹⁰ A person who invests in TIPS and holds them to maturity will not experience this market risk.

With no other financial instrument available to provide riskless, long-term protection against unexpected inflation, TIPS should be attractive to those investors and savers who are willing to accept lower returns for greater peace of mind. They will also provide costless inflation protection to small investors who might not otherwise be able to acquire it.

■ Why Choose TIPS?

To understand why TIPS are important innovations for U.S. investors, it is helpful to examine the ex ante (expected) and ex post (actual) real rate of return on nominal Treasury securities over time. Figure 1 shows the real ex post rates of return on a 10-year nominal Treasury bond and a 10-year TIPS (assuming one had been available) that have earned a fixed rate of 3 percent since 1963. In other words, each data point represents the result of an investment that was made 10 years earlier and held until maturity.¹¹

Interestingly, investors who purchased a 10-year Treasury bond in the late 1960s lost a significant amount of purchasing power on what were—and still are—considered “safe” fixed-income investments. Over the entire period, the real rate of return on nominal bonds ranged from -1.6 to 9.5 percent. Furthermore, nominal Treasury bonds yielded negative real returns for virtually the entire high-inflation decade of 1974 to 1984.

Because we cannot precisely measure the ex ante real rate of return demanded by investors, we cannot pinpoint how TIPS’ returns would have fared against nominal bonds. However, we can be certain that TIPS’ yields would not have

been negative, as were the real yields on traditional bonds during certain high-inflation episodes over this period.

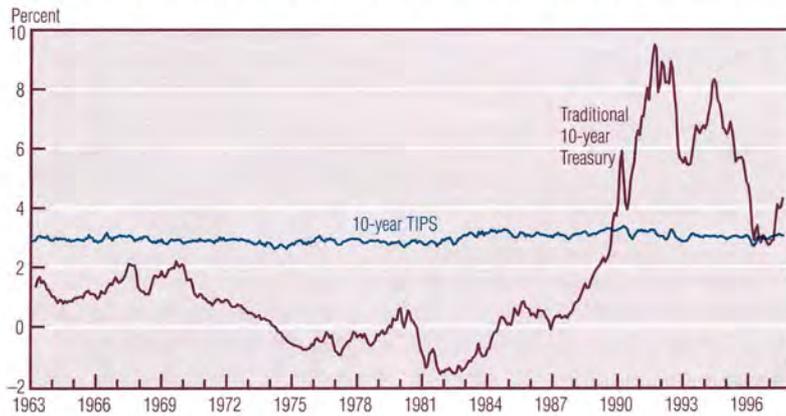
Clearly, no rational investor would accept a negative real rate of return, but that is exactly what happened to those who failed to anticipate the double-digit inflation of the late 1970s and early 1980s. The low-inflation environment of the 1960s led most long-term investors to believe that inflation would not reach the levels it eventually did, just as many investors today might feel that they are safe from any future surges.

Despite the Federal Reserve’s success at holding down inflation since the mid-1980s, there is no guarantee that the CPI will not creep back up to previous levels—or higher. We can never be sure what shocks might hit the economy. Our current low-inflation environment looks very similar to that of the 1960s, but the period in between was marked by several shocks and policy moves that caused prices to soar. TIPS will protect investors if inflation begins to rise again.

■ Performance: TIPS versus Treasuries

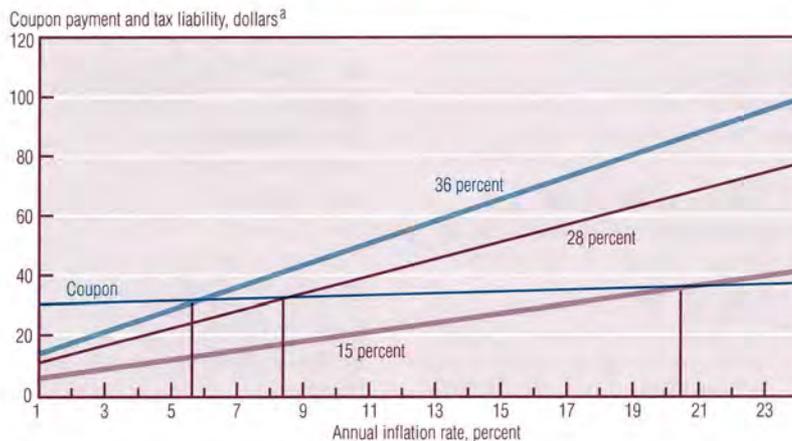
The performance of TIPS compared to nominal Treasury securities depends on the actual rate of inflation relative to expectations. If actual inflation ends up being less than what the market anticipates, TIPS will underperform conventional Treasury securities. Conversely, if actual inflation exceeds expected inflation, TIPS will pay a higher rate of return than conventional Treasuries. The main difference hinges on the accuracy of the market’s predictions about future inflation. If inflation forecasts prove to be correct, then in theory, TIPS’ performance will lag that of traditional Treasuries because the return on the latter includes a premium for inflation risk. However, because TIPS have liquidity problems (discussed in the next section), the difference in returns will depend on the relative sizes of the inflation risk and liquidity premiums.

FIGURE 1 EX POST AVERAGE ANNUAL REAL RETURNS



SOURCE: Authors' calculations.

FIGURE 2 BREAK-EVEN POINTS FOR SELECTED INFLATION AND MARGINAL TAX RATES



a. Based on TIPS' original \$1,000 principal.

SOURCE: Authors' calculations.

The United States has experienced several episodes in which inflation exceeded expectations by a significant margin. Had an inflation-indexed security been available to investors during those times, its performance would have been superior to that of traditional Treasuries.

From April 1963 to August 1997, TIPS' assumed annual real return would have been 3 percent, far above the traditional bond's 1.67 percent average.¹² In fact, TIPS would have outperformed the traditional Treasury bond in every part of this period except for the bonds purchased in the late 1970s and early 1980s, when high expected inflation

produced double-digit coupon rates for traditional Treasuries. When actual inflation finally began to fall in 1981, Treasuries continued to pay these high rates. Had TIPS been available, their principal growth would have diminished. Still, with a guaranteed return above the rate of inflation and the backing of the U.S. government, TIPS would have been a good investment choice over the past three decades.

One Caveat

What if an investor is saving for an item whose price is rising faster than the average price of the goods that make up the CPI's market basket? Government securities are often used to save for major

expenses such as a child's college education or future medical bills. Increases in the prices of these two items have far outpaced the rate of general CPI inflation over the past 20 years. In the 1980s, college costs rose at an average annual rate of 9.5 percent and medical expenses advanced 8.3 percent, compared to an increase in the overall inflation rate of 5.6 percent. This trend has continued in the 1990s. If investors had been using TIPS to save for college or medical care over the past two decades, they would still be behind in real terms. TIPS are a true inflation hedge only if the investor's objective is to use the matured funds to purchase a variety of goods as represented by the CPI.

Liquidity Concerns

Taxes, an important aspect of any investment, are particularly interesting in regard to TIPS. An investor who holds TIPS is taxed annually on the coupon payments and on the inflation adjustments to the principal. Although TIPS' returns are not exposed to taxes any more than any other investment, investors do not receive the total payment that is being taxed. They receive the fixed percentage coupon but not the capital gain on the principal.

It is possible, then (based on the bond holder's marginal tax rate), that the investor's tax bill will exceed the coupon payment if the inflation rate is high enough (see figure 2). This poses a cash-flow problem for investors who might have to draw down another source of income to pay their taxes. Investors lacking alternative sources of cash may be forced to liquidate some of their holdings, which could expose them to market risk and possible losses. All of this is moot, however, if holdings are kept in a retirement account such as a 401(k) or IRA, which allows tax obligations to be deferred.

Despite a successful initial Treasury auction for TIPS, liquidity is still a concern for many investors. Traditional long-term government securities have a total dollar value of \$2.7 trillion outstanding; for TIPS, that figure is only about \$16 billion. TIPS' trading activity is also sporadic, amounting to as much as \$100 million on some days and nothing on others. In contrast, traditional 10-year Treasury notes average about \$4 billion a day in trading. TIPS' volatility and low volume make short-term trading a particularly risky venture. For countries and large corporations that deal in U.S. government debt and need a great deal of liquidity to move in and out of their positions, TIPS may not provide the required liquidity at this time. Perhaps as the Treasury auctions new issues, thereby increasing the size of the market and filling out the term structure, the bonds will become more popular with traders.

■ Savings for the Treasury?

When investors purchase a government bond, they take on several types of risk, including default, market, inflation, and liquidity risk.¹³ Nominal Treasury securities and TIPS carry the same degree of default and market risk. TIPS, however, entail no inflation risk and currently carry more liquidity risk than traditional Treasury securities.

Because investors expect to be compensated for assuming these risks, investments carry premiums that vary according to their risk characteristics. Relatively safe, short-term government securities traditionally come with a "risk-free" rate of return. But even the shortest-term government bonds carry a premium to compensate investors for the risk of inflation.

On a nominal bond, investors demand an inflation premium to compensate them for their expectations about future inflation. But they also demand a risk premium to offset the fact that they must make a guess about future inflation—a guess that could be wrong.

This is where TIPS come into play. By guaranteeing a rate of return that exceeds inflation, the risk premium is eliminated and the Treasury can pay a lower interest rate on the securities. Also, if the public's inflation expectations are higher than what is actually realized, the Treasury can lower its borrowing costs by bearing the risk of inflation itself. Of course, if the reverse is true and actual inflation exceeds expectations, the Treasury will end up paying more to the market than it otherwise would have.

If liquidity continues to be a problem in the market for TIPS, investors may require a premium as compensation for bearing additional risk. This could offset any savings the Treasury might have realized by eliminating the inflation risk premium.

■ Conclusion

TIPS are important new debt instruments that enhance the financial menu already available to U.S. investors. They are the only guaranteed hedge against inflation and can provide cheap protection to investors who might not be able to afford other alternatives.

TIPS are not without risk, however. The market for them is not yet fully developed, and the term structure is incomplete. Those concerned with liquidity may continue to wait on the sidelines until TIPS start trading more consistently and in larger volumes.

Who is likely to invest in TIPS? Conservative investors who do not want to risk their money in the stock market but still want to beat inflation are good candidates. So are individuals who need income from their investments but still hope to preserve the value of their principal. Because of the tax implications, holding TIPS in a tax-deferred account seems a prudent way to use them. Pension and annuity funds are very likely to invest in TIPS.

On the other side of the aisle are those who desire a higher return from their investments and can stomach the risks of the stock market. A portfolio invested in S&P 500 stocks over the past 40 years would have outpaced TIPS by a significant margin. People who are saving for items whose price generally rises faster than the CPI may also want to look into other investments.

The most important point is that Americans now have a new investment vehicle at their disposal. Those who choose this instrument over others will essentially be exchanging the risk of consumer price movements for the risk of underperforming other investment options. TIPS provide a direct hedge against increasing prices. They may not perform well enough to attract some investors, but they offer a safe haven for those who want an investment that is guaranteed to keep pace with inflation.

Footnotes

1. Even when fully anticipated, inflation is detrimental to investors when capital income is taxed. The reason is that the effective tax rate on real returns increases with the rate of inflation.
2. See James Tobin, "An Essay on the Principles of Debt Management," in *Macroeconomics*, vol. 1 of *Essays in Economics*, Cambridge, Mass.: MIT Press, 1987, pp. 439-47; Milton Friedman, "Monetary Correction," in Milton Friedman, ed., *IEA Masters of Modern Economics Series*, Cambridge, Mass.: Blackwell, 1974, pp. 21-47; and Stanley Fischer, "Indexing and Inflation," in *Journal of Monetary Economics*, vol. 12, no. 4 (November 1983), pp. 519-41.
3. In 1985, the Coffee, Sugar, and Cocoa Exchange tried to trade futures contracts based on the CPI. It turned out that there was little interest in a market for inflation itself, and no securities to trade it against, so the effort was discontinued in 1991. Some speculate that TIPS will revive interest in CPI futures. The American public could, of course, purchase foreign-indexed securities, but that would expose them to exchange-rate risk, greater default risk, and the risk that foreign inflation may differ from U.S. price movements.
4. See *Federal Register*, vol. 61, no. 189 (September 27, 1996).
5. The CPI measure used is not seasonally adjusted and is for all urban consumers (CPI-U). To calculate the principal adjustment, the index is lagged three months because of the time it takes to publish it and because of the Treasury's desire to interpolate a day-by-day linear trend in every month. For example, the CPI applicable to April 1 is the reading for January, which is released to the public in February. For the remaining days in April, the CPI is calculated by linear interpolation between the reading applicable to the first day of the month (January's CPI) and the reading applicable to the first day of the following month (February's CPI).
6. According to the Bureau of Public Debt, each successful competitive bidder and each noncompetitive bidder are awarded securities at the price that is equivalent to the highest accepted rate or yield.
7. Tax law suggests that a security returning par value upon maturity is considered a debt instrument. Since the principal amount of an indexed security can fall below par during deflationary periods, the Treasury may have instituted this guarantee to prevent a challenge to TIPS' debt-instrument status.
8. The January 1997 auction offered 10-year TIPS only, while the July 1997 auction included an \$8 billion issue of five-year TIPS. Other unannounced maturities will be issued in auctions later in 1997, as reported in the Treasury Department's Uniform Offering Circular 31 CFR 356.
9. See Alicia H. Munnell and Joseph B. Grolnic, "Should the U.S. Government Issue Index Bonds?" *Federal Reserve Bank of Boston, New England Economic Review*, September/October 1986, pp. 3-21.
10. See John Y. Campbell and Robert J. Shiller, "A Scorecard for Indexed Government Debt," Yale University, Cowles Foundation Discussion Paper No. 1125, May 1996.
11. If TIPS had been available over this period, their yields would have been more volatile than figure 1 suggests. As people's tastes for consumption and saving change, the demand for money (and thus the real rate of return) also changes. The real interest rate affects both nominal bonds and indexed securities in the same way. However, because of the indexed nature of TIPS' payoff, their returns would have been much less volatile than those on nominal securities.
12. Again, this assumes a 3 percent coupon rate, which is only an estimate. (TIPS from the first auction provided a 3.375 percent coupon rate.) Ignored is any shift in the real interest rate (the opportunity cost of holding money), which is affected by such factors as the supply of and the demand for money. A decrease in nominal interest rates could very well have meant a lower TIPS coupon rate. However, the real return on TIPS would not have been negative at any point, distinguishing its performance from that of the traditional Treasury.
13. Credit risk is the uncertainty about the government's ability or willingness to make its coupon or principal payments. This is assumed to be almost nonexistent for the U.S. government. Market risk is the risk associated with shifts in bond prices. Liquidity risk is the risk that one will not be able to sell a security at its fair market value within a short period after purchase. Inflation risk is the uncertainty about investors' returns in real terms.

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The views stated herein are those of the authors and not necessarily those of the Federal Reserve Bank of Cleveland or of the Board of Governors of the Federal Reserve System.

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