

Treasury Inflation-Protected Securities (TIPS): An Introduction

Treasury Inflation-Protected Securities (TIPS) are an often misunderstood fixed income asset class. Some investors hear “inflation-protected” and assume that TIPS returns are perfectly correlated to changes in inflation. In reality, however, they are not. Learning more about the nuances, mechanics and potential benefits of TIPS can help you integrate this asset class into portfolios

TIPS Market Overview & Mechanics

A relatively novel class of bonds, Treasury Inflation-Protected Securities were introduced in the United States in 1997. The basic notion behind their construction is to index the principal and income on a U.S. Treasury security to inflation.¹

The US TIPS market is the world’s largest inflation- indexed securities market with a market value of over \$1.87 trillion.² The Federal Reserve (Fed) is a major buyer of TIPS, currently holding \$362 billion in its System Open Market Account Holdings of Domestic Securities (SOMA) account.³

Because the overall market size of TIPS is smaller than that of traditional Treasuries (\$10.14 trillion),⁴ supply and demand factors can have a greater impact on the price of TIPS than regular Treasuries. For example, as a result of the Fed asset purchase program, the net supply of publicly held TIPS declined by \$184 billion in 2020,⁵ contributing to TIPS prices appreciating on the year.

Beyond the market size, TIPS differ from regular Treasuries in three main ways.

Principal of Bond Adjusted for Inflation Unlike a standard nominal U.S. Treasury the principal amount of TIPS is adjusted up or down based on changes in inflation. To measure inflation, the Treasury Department uses changes in the CPI, or Consumer Price Index for All Urban Consumers (not seasonally adjusted). While the principal amount on individual TIPS is adjusted daily and used to calculate interest payments, it is not received by the investors until maturity (a phenomenon referred to as phantom income). At maturity, an investor will receive the inflation-adjusted principal value. If there has been deflation, the U.S. government guarantees that the inflation-adjusted principal amount of the bond at maturity will not be less than the bond’s original face value (i.e., it is floored at 1,000).

Coupon Rate Based on Real Interest Rates TIPS will pay out a fixed percentage of the principal as its coupon biannually until maturity. The initial coupon of a TIPS is based on the “real interest rate.” This differs from regular US Treasuries which are based on a “nominal interest rate,” a summation of the “real interest rate” and the market’s assumption of future inflation. As TIPS have a principal inflation adjustment feature, the real rate is almost always lower than the nominal rate.

Periodic Coupon Payment Changes The coupon rate for TIPS is fixed at the point of issue. However, at each semiannual *coupon payment*, the bond’s stated coupon rate multiplied by the inflation-adjusted principal amount can change. If inflation has been positive, and the principal amount has increased, the bond’s coupon payment will also increase proportionally.

TIPS ETFs vs. Individual Securities

Figure 1
TIPS vs. TIPS ETFs

When deciding *how* to add exposure to TIPS as an asset class, consider how TIPS exchange traded funds (ETFs) compare to individual TIPS. Figure 1 summarizes these differences.

Key Differences Between TIPS and TIPS ETFs	TIPS ETFs	Individual TIPS Bonds
Diversified	Yes	No
Inflation adjustment	Paid monthly	Paid at maturity
Frequency of payments	Monthly	Semi-annually
Set Maturity Date	No	Yes
Phantom Income	No	Yes
Exchange traded	Yes	No, OTC

Source: State Street Global Advisors, September 30, 2021.

TIPS ETFs offer three potential benefits:

- 1 TIPS ETFs are Both Liquid and Diversified** Average daily trading volume of TIPS ETFs is \$57 billion,⁶ and the ETF will hold several TIPS securities across different maturities. Additionally, through an ETF, as a result of professional money management, you may also receive better trade execution pricing on the underlying holdings than you might otherwise receive when investing in individual TIPS on your own.
- 2 TIPS ETFs Pay the Rate of Inflation as Realized** TIPS ETFs pay out all earned income in the portfolio, including an inflation adjustment that is applied to the fund’s underlying securities, based on three months’ prior CPI. With individual TIPS, the inflation adjustment is received only at maturity. The lag associated with the payment is because the reference CPI for TIPS for the first day of any calendar month is actually the CPI published for the third prior calendar month.
- 3 TIPS ETFs Avoid Phantom Income** One of the complicating issues of using individual TIPS is that investors must pay taxes each year on the inflation adjustment to the principal even though the inflation adjustment isn’t received until the bond matures. ETFs avoid issuing this “phantom income” by distributing all inflation adjustments (classified as Treasury income) as they are accrued. This turns phantom income into realized cash flows. If there is deflation, the TIPS ETF might omit or not pay a monthly distribution.

Fund managers of TIPS ETFs have the option of marketing “SEC yields” on their website, or the annualization of dividends and interest earned per share during the prior 30 days, less expenses, as prescribed by Securities and Exchange Commission (SEC) rules. Given the payment of the inflation principal and the potential elimination of a payment if there is deflation, an ETF’s yield metric may be distorted.

Though the TIPS principal rises with higher inflation, the SEC doesn’t specify whether the SEC yield should include the inflation adjustment to income. Therefore, if inflation is exceptionally high, a fund’s SEC yield that adjusts for inflation will be higher than fund peers that do not include the inflationary adjustment to the principal. However, it may be misleading to include the inflationary adjustment in the SEC yield calculation, as it assumes that on a go-forward basis the inflation reading in the prior months will be persistent and make comparisons difficult.

How the Breakeven Inflation Rate Impacts Performance

Evaluating the breakeven inflation rate — the annualized rate of CPI inflation over the life of the bond that makes the total return of a TIPS equal to that of a similar-tenor Treasury — is also important when comparing TIPS to nominal Treasuries.

Calculated as the yield difference between Treasury bonds and TIPS of the same maturity, breakeven rates are, ultimately, a proxy for the market’s inflation expectations. The lower the rate, the lower the expectation for inflation.

Positive inflation typically benefits the performance of TIPS, while falling inflation (deflation/ disinflation) may cause lower performance. It is important to note that market inflation expectations are often already priced into TIPS. Therefore, for inflation trends to be beneficial for the relative return of TIPS, it must develop at a rate that is higher than the market’s anticipated breakeven inflation rates.

The following example illustrates how the inflation adjustment feature of TIPS works during a period of inflation and what it means for returns. If the US 10-year yield is 1.24% and the yield on a 10-year TIPS bond is -1.16%, this means that the breakeven rate is 2.40%. If inflation over the next 10 years is 2.5%, this would lead to stronger relative performance, all else equal, for TIPS versus nominals, as realized inflation was higher than what was estimated (as represented by the breakeven) at the time of purchase.

A change in market expectations or uncertainty about inflation can change TIPS prices before maturity, however. For example, beginning in April 2021 nominal and real yields both fell. Yet, real yields fell faster as a result of widening breakeven rates and investors’ desire to mitigate the effects of inflation on their Treasury exposure. At the time, therefore, investors felt breakeven rates (i.e., market-based inflation expectations) were understated and not reflective of the loose policy environment. As expectations increased, TIPS outperformed nominal Treasuries by almost 5% through the first eight months of the year.⁷

TIPS Role in a Portfolio

One of the primary advantages of TIPS is that they are backed by the full faith and credit of the U.S. government. Because TIPS offer the government’s assurance that investors will never receive less than the original face value of the bond at maturity, even in the event of deflation during the life of the bond, TIPS have very low credit risk. And among asset classes used as inflation hedges, TIPS have historically been the least volatile. As shown in Figure 2, compared to equities, commodities or real estate, TIPS have historically exhibited a lower standard deviation of returns.

Figure 2
**Asset Class Return
 and Volatility**

	Annualized Return (%)	Standard Deviation (%)	Sharpe Ratio
TIPS (1-10 year)	2.58	3.15	0.63
TIPS (full duration)	3.12	4.23	0.60
Agg	3.01	2.98	0.81
Non-US Govt Bonds	1.06	4.97	0.09
US High Yield Bonds	7.42	6.73	1.01
US equities	16.63	13.21	1.21
Non-US equities	8.60	14.28	0.56
Real Estate	11.94	15.15	0.75
Commodities	-4.83	21.41	-0.25

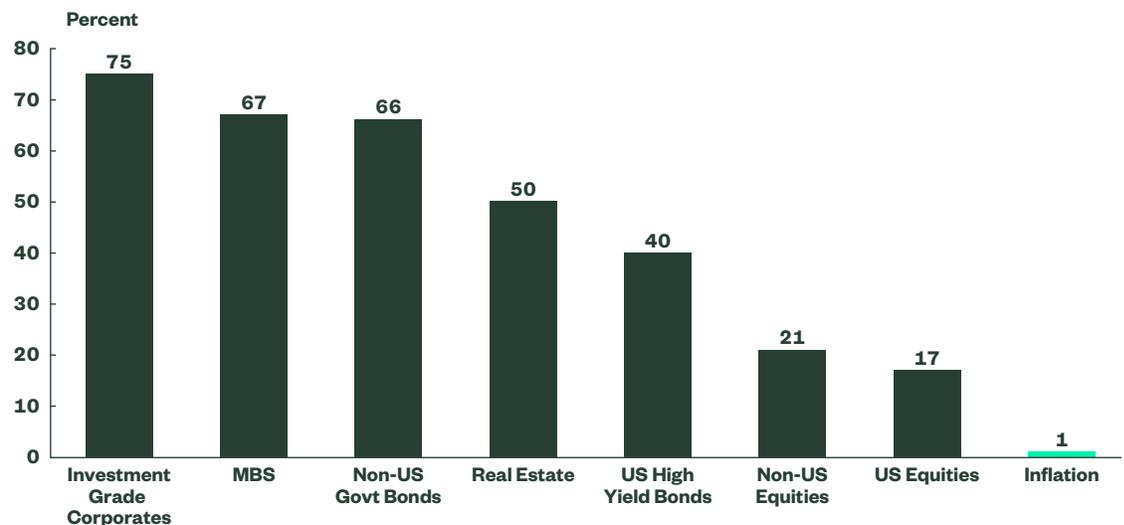
Source: FactSet, September 30, 2011–September 30, 2021. TIPS 1-10 Year = Bloomberg U.S. Treasury TIPS 1-10 Year Index; TIPS Full Duration = Bloomberg U.S. Treasury TIPS Index; Agg = Bloomberg U.S. Aggregate Bond Index; Non US Govt Bonds = FTSE WGBI; US High Yield Bonds = Bloomberg U.S. High Yield Corporate Bond Index; US Equities = S&P 500 Index; Non-US Equities = MSCI EAFE Index; Real Estate = FTSE NAREIT All Equity REIT Index; Commodities = S&P GSCI Index. **Past performance is not indicative for future returns.** Index returns are unmanaged and do not reflect the deduction of any fees or expenses. Index returns reflect all items of income, gain and loss and the reinvestment of dividends and other income as applicable.

While TIPS are directly indexed to changes in inflation, many investors are surprised to see the low correlation between TIPS and inflation. Over the past 10 years, TIPS registered barely any correlation to inflation (1%).⁸

The low correlation stems from the fact that TIPS, like all bonds, have a duration and changes in interest rates can have a much larger impact on returns. However, on a relative basis to nominal Treasuries, the excess return on TIPS have a 71% correlation⁹ — underscoring how performance of TIPS should be viewed both on an absolute and relative basis.

As a distinct asset class from Treasuries — and not a component of the widely followed Bloomberg Aggregate Index — TIPS also tend to behave differently from other investments that are commonly found in core bond portfolios. As shown in Figure 3, TIPS are not perfectly correlated to common fixed income investments and have a low correlation to equities, making them a valuable portfolio diversifier. Therefore, including TIPS may help improve the risk/return profile of a diversified portfolio irrespective of the market’s inflation dynamics.

Figure 3
**Asset Class
 Correlation to TIPS
 (2011-2021)**



Source: FactSet, Bloomberg Finance, L.P., Period: September 30, 2011–September 30, 2021. TIPS = Bloomberg U.S. Treasury TIPS Index; IG Corporates = Bloomberg U.S. Corporate Investment Grade Index. MBS = Bloomberg Multiverse MBS Index. Non-US Govt Bonds = FTSE WGBI; High Yield = Bloomberg U.S. High Yield Corporate Bond Index; US Equities = S&P 500 Index; Non-US Equities = MSCI EAFE Index; Real Estate = FTSE NAREIT All Equity REIT Index; Inflation = US CPI Urban Consumers NSA Index.

Rate Risks for TIPS

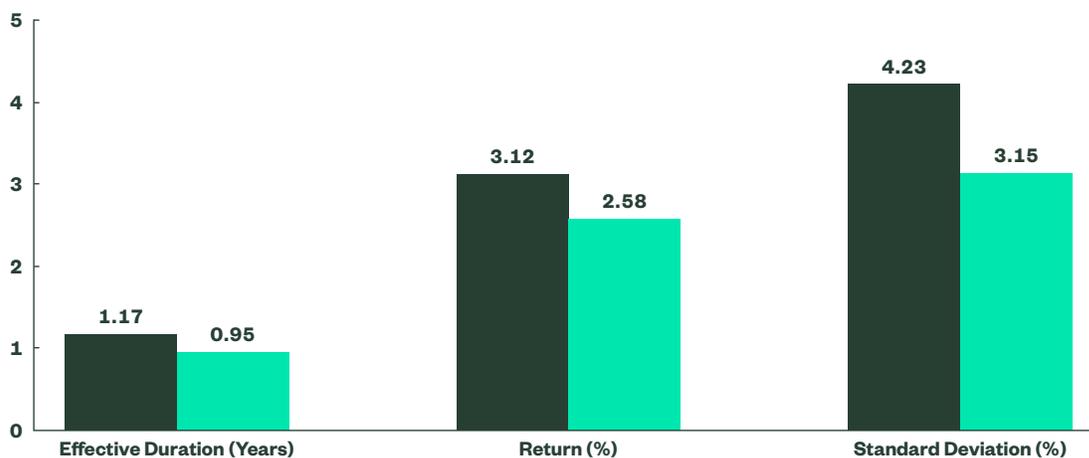
Like all bonds, TIPS are subject to interest-rate risk. For example, in the first three quarters of 2018 when rates rose without a commensurate uptick in inflation expectations, TIPS registered a negative return (-0.92%).¹⁰

One way to reduce the interest-rate sensitivity of TIPS is to use a TIPS portfolio with a shortened duration profile. Figure 4 illustrates how the TIPS 1-10-year index has a 19% shorter duration than the full-duration index but retains most (83%) of the return potential, with 26% lower volatility. In the above example from 2018, 1-10-year TIPS were essentially flat at -0.22%.¹¹

Relative to TIPS overall, those with a shorter duration (1-10 years) can also offer a stronger correlation to inflation (10% vs 1%)¹² while offering similar return potential and lower volatility.

Figure 4
Duration, Return,
and Volatility of
TIPS Exposures

■ Full Duration TIPS
■ 1-10 year TIPS



Source: FactSet, Bloomberg Finance, L.P., as of September 30, 2021. Return and standard deviation measured for the 10-year period ending July 31, 2021. TIPS = Bloomberg U.S. Treasury TIPS index; 1-10 Year TIPS = Bloomberg U.S. Treasury 1-10 Year Index. Index returns are unmanaged and do not reflect the deduction of any fees or expenses. Index returns reflect all items of income, gain and loss and the reinvestment of dividends and other income as applicable. **Past performance is not a reliable indicator of future performance.**

Investors may want to consider adding TIPS to their portfolios. SPDR offers a breadth of Inflation Linked ETFs that are designed to protect against inflation in the US as well as in developed and emerging market countries.

Figure 5
SPDR Inflation Linked ETFs

Ticker	Name	Benchmark	AUM (\$M)	Net Expense Ratio (%)	Duration (Years)
SPIP	SPDR® Portfolio TIPS ETF	Bloomberg Barclays U.S. Government Inflation-Linked Bond Index	3,074	0.12	8.70
TIPX	SPDR® Bloomberg Barclays 1-10 Year TIPS ETF	Bloomberg Barclays 1-10 Year U.S. Government Inflation-Linked Bond Index	908	0.15	4.99
WIP	SPDR® FTSE International Government Inflation-Protected Bond ETF	FTSE International Inflation-Linked Securities Select Index	436	0.50	11.65

Source: State Street Global Advisors, Morningstar as of 09/30/2021.

Endnotes

- 1 US Treasury.
- 2 Bloomberg Finance, L.P., as of September 30, 2021. Based on the ICE BofA All Maturity US Inflation-Linked Treasury Index.
- 3 Bloomberg, Federal Reserve as of September 30, 2021.
- 4 Bloomberg Finance, L.P., as of September 30, 2021. US Treasury market is based on the Bloomberg U.S. Treasury Index.
- 5 Bloomberg, Federal Reserve, Period: January 01, 2020–December 31, 2020.
- 6 Bloomberg Finance L.P., as of September 30, 2021.
- 7 Bloomberg Finance L.P., as of September 30, 2021. based on the return of the Bloomberg U.S. Treasury TIPS Index and the Bloomberg U.S. Treasury Index.
- 8 Bloomberg Finance, L.P., Period: September 30, 2011–September 30, 2021. Inflation = US CPI Urban Consumers NSA Index; TIPS = Bloomberg U.S. Treasury TIPS Index.
- 9 FactSet, Bloomberg Finance, L.P., Based on Trailing 12-month returns of the Bloomberg U.S. Treasury TIPS Index and the Bloomberg U.S. Treasury Index from September 30, 2011 to September 30, 2021. compared to year over year changes in CPI.
- 10 Bloomberg Finance, L.P., Period January 1, 2018–September 30, 2018. TIPS = Bloomberg U.S. Treasury TIPS Index.
- 11 Bloomberg Finance, L.P., Period January 1, 2018–September 30, 2018. 1–10 Year TIPS = Bloomberg U.S. Treasury TIPS 1–10 Year Index.
- 12 Bloomberg Finance, L.P., Period: July 31, 2011–September 30, 2021. Inflation = US CPI Urban Consumers NSA Index; TIPS = Bloomberg U.S Treasury TIPS Index; 1–10 Year TIPS = Bloomberg U.S. Treasury TIPS 1–10 Year Index.

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Glossary

Bloomberg U.S. Treasury Index Measures US dollar-denominated, fixed-rate, nominal debt issued by the US Treasury.

Bloomberg U.S. Govt Inflation-Linked All Maturities Index Measures US dollar-denominated, fixed-rate, inflation linked debt issued by the US Treasury.

Bloomberg U.S. Treasury TIPS 1-10 Year Index Measures the performance of the US TIPS market with less than 10 years to maturity. Federal Reserve holdings of US TIPS are not index eligible and are excluded from the face amount outstanding of each bond in the index.

Bloomberg U.S. Treasury TIPS Index Measures the performance of the US TIPS market. Federal Reserve holdings of US TIPS are not index eligible and are excluded from the face amount outstanding of each bond in the index.

Bloomberg U.S. Aggregate Bond Index A broad-based flagship benchmark that measures the investment grade, US dollar-denominated, fixed-rate taxable bond market. The index includes Treasuries, government-related and corporate securities, MBS (agency fixed-rate pass-throughs), ABS and CMBS (agency and non-agency).

S&P 500 Index A widely regarded as the best single gauge of large-cap U.S. equities.

FTSE NAREIT All Equity Index A free-float adjusted, market capitalization-weighted index of U.S. equity REITs. Constituents of the index include all tax-qualified REITs with more than 50 percent of total assets in qualifying real estate assets other than mortgages secured by real property.

S&P GSCI Index A widely recognized leading measure of general price movements and inflation in the world economy. Provides

investors with a reliable and publicly available benchmark for investment performance for investment performance in the commodity markets.

US CPI Urban Consumers NSA Index Measure of prices paid by consumers for a market basket of consumer goods and services.

Bloomberg U.S. Corporate Investment Grade Index Measures the investment grade, fixed-rate, taxable corporate bond market.

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Increase in real interest rates can cause the price of inflation-protected debt securities to decrease. Interest payments on inflation protected debt securities can be unpredictable.

Bonds generally present less short-term risk and volatility than stocks, but contain interest rate risk (as interest rates rise, bond prices usually fall); issuer default risk; issuer credit risk; liquidity risk; and inflation risk. These effects are usually pronounced for longer-term securities. Any fixed income security sold or redeemed prior to maturity may be subject to a substantial gain or loss.

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State Street Global Advisors, 1 Iron Street, Boston, MA 02210-1641.

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