

INFLATION INDEXED TREASURIES: HOW GOOD ARE THEY?

By Robert J. Angell and Alonzo L. Redmon

Inflation-indexed Treasuries were designed to protect fixed-income investors from inflation, but the way in which they are taxed decreases the protection, and investors need to be aware of the limitations.

On January 29, 1997, the U.S. Treasury auctioned off its first issue of inflation-indexed securities.

These instruments have piqued the interest of many fixed-income investors because of their intended benefits—they were designed to protect fixed-income investors from the adverse effects of inflation on their real rate of return.

Unfortunately, the manner in which inflation gains are taxed decreases the protection against inflation afforded by the new securities. The adjustment protects the investors from only a portion of the inflation, and investors need to be aware of the nature of the inflation protection limitations inherent in the new securities.

This article focuses on the key question facing fixed-income investors: “How good are these new securities?”

HOW INFLATION HURTS

Inflation has a negative impact on all investments, but it is particularly harmful to fixed-income investments because it reduces the purchasing power of the interest earned, as well as the purchasing power of the underlying principal investment. An investor earning a fixed nominal rate of 6% each year would have \$1.06 at the end of the year for each \$1.00 invested at the beginning of the year. However, if prices rise by 3% during that year, the \$1.06 will purchase only 2.91% more goods than at the beginning of the year. Thus, in “real” (inflation-adjusted) terms, the investor had a real return (before taxes) of 2.91%. In addition, if that investor had to pay federal and state taxes of 30% on the interest earned, the investor would only have \$1.042 for each dollar invested and would only be able to buy 1.17% percent more than at the beginning of the year. In our not all-together unusual example, the combination of inflation and taxes reduced the fixed return from 6% to only 1.17%.

To the extent that investors can anticipate future inflation, market forces will increase the nominal rate to compensate for the expected inflation. However, because inflation cannot be perfectly predicted, it poses a real threat to those investing in fixed payment securities. Investments that protect investors against the risk of unanticipated inflation would definitely be attractive. Such is the objective of inflation-adjusted Treasuries, whose pretax rate of return is adjusted for both anticipated and unanticipated inflation.

HOW THE SECURITIES WORK

As with other Treasury bonds and notes, the new inflation-adjusted securities are sold with a face value (principal) of \$1,000 and with a designated coupon rate. However, at the end of each interest period (six months), the principal value is increased by the percentage increase in the consumer price index (CPI) during that interest period. Thus, the method of adjusting for inflation in these securities is not to change the coupon rate, but to hold the

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coupon rate constant while increasing the principal value upon which subsequent interest will be paid.

With a constant coupon rate, the dollar interest payment grows as the principal value rises due to the inflation adjustment. Unfortunately, the increase in the principal value, as well as the interest payment, is included in the investor's taxable income. Thus, the investor is protected against inflation only on a before-tax basis. Taxing the entire nominal gain, as opposed to just the interest payment, does not provide full inflation protection.

AN EXAMPLE

An example might prove to be helpful in understanding the effect of the taxation treatment on the investor's real rate of return. The example is summarized in Table 1.

Let's assume that the coupon rate is 3.375% on a \$1,000, 10-year, inflation-indexed bond (this is the actual bond issued in January). Let's further assume that the bonds sell

for their face value and that the actual inflation is 1.5% for each six months, or an annual rate of 3% per year.

The first interest payment, in six months, would be \$16.88 per bond ($\$1,000 \times 0.03375 \div 2$). The inflation adjustment is \$15.00 ($0.015 \times \$1,000$), and the principal for the next six months is \$1,015. Total taxable income to the investor, therefore, is \$31.88 ($\$16.88 + \15).

Taxes on the income will be \$8.93 for the investor in the 28% tax bracket ($0.28 \times \$31.88$). To simplify, let's assume that the investor pays the taxes when the interest payments are received. Thus, the investor receives a net cash inflow (income less taxes) at the end of six months of \$7.95 ($\$16.88 - \8.93) for each \$1,000 initially invested.

The second interest payment, at the end of the first year, will be \$17.13 per bond (the new inflation-adjusted value times the interest payment, or $\$1,015 \times 0.03375 \div 2$). The inflation adjustment for the next six months is \$15.23 ($\$1,015 \times 0.015$), so the total

taxable income is \$32.36, and the bond's maturity value will be increased to \$1,030.23 ($\$1,015 + \15.23). For this period, taxes on the total income are \$9.06 ($28\% \times \32.36) and the net cash received is \$8.07.

Assuming that the investor holds the bond for the full 10 years and then redeems it, the investor will earn an annual aftertax rate of return of 4.6% on a nominal basis—that is, unadjusted for inflation. However, in real

terms (adjusting for inflation) and using aftertax cash flows, the annual rate of return is only 1.6%.

If there had been no inflation over the 10-year period—the interest payments remained at 3.375% and there was no increase in principal—both the nominal and real aftertax rates of return would have been 2.4%. Thus, we can see that while the nominal rate of return will increase with inflation, the real rate of return after taxes declines. Due to the tax treatment, the inflation adjustment protects the investor from only a portion of the unanticipated inflation, not from it all.

Table 2 shows the nominal and real aftertax rates of return for the investor in the 28% tax bracket for the hypothetical bond under various inflation assumptions, assuming that the 10-year bond was held to maturity.

As can be seen in Table 2, while the inflation-adjustment increases the nominal aftertax rate of return for the investor, the real aftertax rate of return declines as inflation increases. On the other hand, inflation also decreases the real aftertax rate of return for Treasury securities that do not have the inflation adjustment. Consider a Treasury security of comparable maturity without the adjusting feature that has a yield that is 2.4% points above the rate of the inflation-indexed bond (which is currently the approximate difference between these two types of securities). Table 3 shows the nominal and real aftertax rates of return for the 28% tax bracket investor under the same inflation adjustments as used above.

While the nominal aftertax return remains a constant 4.1%, which is higher than on the inflation-indexed security, the real aftertax rate declines faster on the non-indexed security with higher rates of inflation.

Comparing the tables, you can see that the inflation-indexed security provides a higher aftertax real rate

TABLE 1. AN EXAMPLE

Coupon: 3.375% (1.6875% every 6 months)
Inflation: 3% (1.5% every 6 months)
Security: \$1,000, 10-year inflation-indexed bond
Tax-bracket: 28%

The First 6 Months:

Principal Value	\$1,000.00
Interest [$1.6875\% \times \text{Principal}$]	\$16.88
Inflation Adjustment [$\text{Principal} \times 1.5\%$]	\$15.00
Total Taxable Income [Interest + Inflation. Adj.]	\$31.88
Taxes [Taxable income $\times 28\%$]	\$8.93
Net Interest Income [Interest Less Taxes]	\$7.95

The Following 6 Months:

Principal Value [Prior Principal $\times 1.5\%$]	\$1,015.00
Interest [$1.6875\% \times \text{Principal}$]	\$17.13
Inflation Adjustment [$\text{Principal} \times 1.5\%$]	\$15.23
Total Taxable Income [Interest + Inflation. Adj.]	\$32.36
Taxes [Taxable Income $\times 28\%$]	\$9.06
Net Interest Income [Interest Less Taxes]	\$8.07

Nominal aftertax rate of return over 10 years:	4.6%
Real aftertax rate of return over 10 years:	1.6%

of return when inflation is 3% or higher, while the non-indexed Treasuries provide higher aftertax real rates of return when inflation is 2% or lower. More specifically, for this situation, the "breakeven" inflation rate is about 2.4%. As long as inflation is *less than* 2.4% annually, the investor has a higher aftertax real rate of return with a non-indexed security. But if inflation is *greater than* the 2.4% rate, the inflation-indexed security provides a higher relative real return. Unfortunately, the real rates of return in such cases are quite low.

DEFERRING THE TAXES

Since the protection against inflation is reduced by the taxation

of the increased principal, investing in these securities through a tax-deferred plan, such as an IRA, and delaying the taxes until funds are withdrawn provides the opportunity to increase both the nominal and real aftertax rate of return. The precise nature of the effect is dependent upon when funds are withdrawn and taxed, as well as the tax rate effective at the time the funds are withdrawn. The longer the deferral, the greater will be both the aftertax nominal and real rates. Table 4 shows the rates for a hypothetical 10-year inflation indexed bond invested in a tax-deferred plan (401(k), 403(b), IRA, etc.), withdrawn at the end of the 10-year period, and taxed at 28% under various annual rates of

inflation over the 10-year period.

SUMMARY

As can be seen from the data presented above, the benefits of the inflation-indexed securities are rather limited. On the one hand, the adjustment process in the inflation-indexed securities provides some protection against unanticipated inflation. On the other hand, this obviously comes with a lower coupon rate than on typical Treasury securities of comparable maturity. The precise spread between the coupons offered by these two types of securities (with comparable maturity) should be a function of inflation expected over the life of the securities.

If you are trying to determine which Treasury security is best for your situation, here are some guidelines:

- Non-indexed securities will outperform indexed securities on an aftertax basis during periods where inflation is less than expected.
- Inflation-indexed securities will outperform non-indexed securities on an aftertax basis in periods where inflation is higher than expected.
- Because of the way they are taxed, inflation-indexed securities can be more effectively used in a tax-deferred account.
- While inflation-indexed securities do offer inflation protection during high inflationary periods, real yields (yields after inflation) tend to remain relatively low. Investors should keep these real rates in mind, particularly when investing over longer time periods, since alternative securities such as stocks tend to provide substantially higher real rates of return. ♦

**TABLE 2. AFTERTAX ANNUAL RETURNS
FOR INFLATION-INDEXED TREASURIES**

28% TAX BRACKET INVESTOR
10-YEAR MATURITY
3.375% ORIGINAL COUPON

	Annual Inflation					
	0%	1%	2%	3%	4%	5%
Nominal Aftertax Rate (%)	2.4	3.2	3.9	4.6	5.4	6.1
Real Aftertax Rate (%)	2.4	2.2	1.9	1.6	1.3	1.0

**TABLE 3. AFTERTAX ANNUAL RETURNS
FOR NON-INDEXED TREASURIES**

28% TAX BRACKET INVESTOR
10-YEAR MATURITY
5.7% COUPON

	Annual Inflation					
	0%	1%	2%	3%	4%	5%
Nominal Aftertax Rate (%)	4.1	4.1	4.1	4.1	4.1	4.1
Real Aftertax Rate (%)	4.1	3.1	2.1	1.1	0.1	(0.8)

**TABLE 4. AFTERTAX ANNUAL RETURNS
FOR INFLATION-INDEXED TREASURIES, TAX-DEFERRED FOR 10 YEARS**

28% TAX BRACKET INVESTOR
10-YEAR MATURITY
3.375% ORIGINAL COUPON

	Annual Inflation					
	0%	1%	2%	3%	4%	5%
Tax-Deferred Rate*:						
Nominal Aftertax Rate (%)	2.5	3.3	4.2	5.0	5.9	6.7
Real Aftertax Rate (%)	2.5	2.3	2.1	1.9	1.8	1.6

*This excludes the reinvestment of interest, which will either increase or decrease the effective rate depending upon the relative reinvestment rate.