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# Comparing Bond Yields

**Prepared for:**  
Duane's Instructor Corner

## Coupon Rates and Current Yield

If you're considering investing in a bond, one of the factors you need to understand is its yield. But it's important to know exactly what type of yield you're looking at.

What exactly is "yield?" The answer depends on how the term is used. In the broadest sense, an investment's yield is the return you get on the money you've invested. However, there are many different ways to calculate yield, particularly with bonds. Considering yield can be a good way to compare investments, as long as you know what yields you're comparing and why.

### Coupon rate

People sometimes confuse a bond's yield with its coupon rate (the interest rate that's specified in the bond agreement). A bond's coupon rate represents the amount of interest you earn annually, expressed as a percentage of its face (par) value. If a \$1,000 bond's coupon rate pays \$50 a year in interest, its coupon rate would be 5%.

The coupon rate is typically fixed. Though it does represent what a bond pays, it's not the best measure of the return you're getting on that investment.

### Current yield

A bond's current yield represents its annual interest payments as a percentage of the bond's market

value, which may be higher or lower than par. As a bond's price goes up and down in response to what's happening in the marketplace, its current yield will vary also. For example, if you bought a \$1,000 bond with a 5% coupon rate for \$900 on the open market, its current yield would be 5.55% (the \$50 annual interest divided by the \$900 purchase price). If you bought the same \$1,000 bond for \$1,200, the current yield would be 4.16% (\$50 divided by \$1,200).



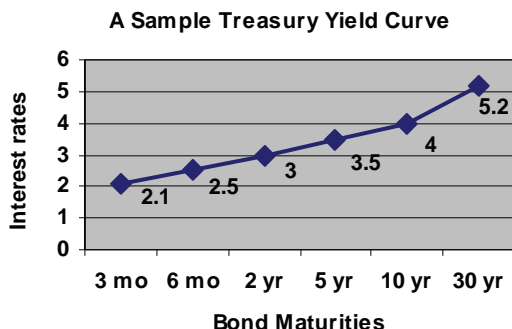
If you buy a bond at par and hold it to maturity, the current yield and the coupon rate would be the same. However, for a bond sold at a premium or a discount to its face value, the yield and the coupon rate are different.

If you are concerned only with the amount of current income a bond can provide each year, then calculating the current yield may give you enough information to decide whether you should purchase that bond. However, if you are interested in a bond's performance as an investment over a period of years, or you want to compare it to another bond or other income-producing investment, the current yield will not give you enough information. In that case, yield to maturity will be more useful.

## Watching the Yield Curve

Bond maturities and their yields are related. Typically, bonds with longer maturities pay higher yields. Why? Because the longer a bondholder must wait for the bond's principal to be repaid, the greater the risk compared to an identical bond with a shorter maturity, and the more return investors demand.

If you were to draw a line on a chart that compares the yields of, for example, Treasury securities with various maturities, you would typically see a line



that slopes upward as maturities lengthen and yields increase. The greater the difference between the yields on T-bills and 30-year bonds, the steeper that slope. A steep yield curve often occurs because investors expect the economy to do well and therefore want greater compensation for tying up their money for longer periods and running the risk that inflation will cut net returns over time. A flat yield curve means that there is little difference between short and long maturities.

**One of the most widely used yield curves is that for Treasury securities, because they have virtually no credit risk and a wide range of maturities.**

However, sometimes the yield curve can actually become inverted; in this case, short-term interest rates are higher than long-term rates. For example, in 2004 the Federal Reserve Board began increasing short-term rates, but long-term rates didn't rise as quickly. A yield curve that stays inverted for a period of time is believed to indicate a recession may be about to occur.

## Yield to Maturity, Yield to Call

### Yield to maturity

Yield to maturity (YTM) reflects the rate of return on a bond at any given time (assuming it is held until its maturity date). It takes into account not only the bond's interest rate, principal, time to maturity, and purchase price, but also the value of its interest payments as you receive them over the life of the bond. Yield to maturity includes the additional interest you could earn by reinvesting all of the bond's interest payments at the yield it was earning when you bought it.

If you buy a bond at a discount to its face value, its yield to maturity will be higher than its current yield. Why? Because in addition to receiving interest, you would be able to redeem the bond for more than you paid for it. The reverse is true if you buy a bond at a premium (more than its face value). Its value at maturity would be less than you paid for it, which would affect your yield.

**Example:** If you paid \$960 for a \$1,000 bond and held it to maturity, you would receive the full \$1,000 principal. The \$40 difference between the purchase price and the face value is profit, and is included in the calculation of the bond's yield to maturity. Conversely, if you bought the bond at a \$40 premium, meaning you paid \$1,040 for it, that premium would reduce the bond's yield because the bond would be redeemed for \$40 less than the purchase price.

### Why is yield to maturity important?

Yield to maturity lets you accurately compare bonds with different maturities and coupon rates. It's particularly helpful when you are comparing older bonds being sold in the secondary market that are priced at a discount or at a premium rather than face value. It's also especially important when looking at a zero-coupon bond, which typically sells at a deep discount to its face value but makes no periodic interest payments. Because you receive all of a zero's return at maturity, when its principal is repaid, any yield

quoted for a zero-coupon bond is always a yield to maturity.

### Yield to call

When it comes to helping you estimate your return on a callable bond (one whose issuer can choose to repay the principal before maturity), yield to maturity has a flaw. If the bond is called, the interest payments will come to an end. That reduces its overall yield to the investor. Therefore, for a callable bond, you also need to know what the yield would be if the bond were called at the earliest date allowed by the bond agreement. That figure is known as its yield to call; the calculation is the same as with yield to maturity, except that the first call date is substituted for the maturity date.

A bond issuer will generally call a bond only if it's profitable for the issuer to do so. For example, if interest rates fall below a bond's coupon rate, the issuer is likely to recall the bond and borrow money at the newer, lower rate, much as you might refinance your mortgage if interest rates drop. The less time until the first date the bond can be called, and the lower that current interest rates are when compared to the coupon rate, the more important the yield-to-call figure becomes.

### Why is yield to call important?

If you rely on the income from a callable bond--for example, if it helps pay living expenses--yield to call is especially significant. If the bond is called at a time when interest rates are lower than when you purchased it, that reinvested principal might not provide the same amount of ongoing income. Why? Because you would likely have difficulty getting the same return when you reinvest unless you took on more risk.

### Comparing bond and dividend yields

*When considering sources of investment income, you can compare a bond's yield to a stock's dividend yield. Because it's calculated by dividing a stock's annual dividend payments by the stock's price, dividend yield will rise when the stock's price falls, and vice versa (assuming the dividend stays the same).*



## Comparing Taxable and Tax-Free Yields

It's important to consider a bond's after-tax yield--the rate of return earned after taking into account taxes (if any) on income received from the bond. Some bonds--for example, municipal bonds ("munis") and U.S. Treasury bonds--may be tax exempt at the federal and/or the state level. However, most bonds are taxable.

### It's what you keep, not what you get

A tax-exempt bond often pays a lower interest rate than an equivalent taxable bond, but may actually have a higher yield once the impact of taxes has been factored in. Whether this is true in your case depends on your tax bracket. It also can be affected by whether you must pay not only federal but state and local taxes as well.

For example, let's say you consider investing in either Bond A, a tax-exempt bond paying 4% interest, or Bond B, a taxable bond paying 6% interest. You want to find out



whether Bond A or Bond B would be a better investment in terms of after-tax yield. For purposes of this illustration, let's also say you are in the 35% federal tax bracket and do not have to pay state taxes. You determine that Bond A's after-tax yield is 4% (the same as its pretax yield, of course). However, Bond B's yield is only 3.8% once taxes have been deducted.

You'd probably decide that tax-exempt Bond A would be better because of its higher after-tax yield.

### The impact of freedom from taxes

In order to attract investors, taxable bonds typically pay a higher interest rate than tax-exempt bonds. Why? The associated tax exemption effectively in-

creases the after-tax value of a tax-free bond's yield. That tax advantage can mean a difference of several percentage points between a corporate bond's coupon rate--the annual percentage rate it pays bondholders--and that of a muni with an identical maturity period.

Still, as the earlier example demonstrates, a tax-free bond could actually provide a better after-tax return. Generally, the higher your tax bracket, the higher the tax-equivalent yield of a muni bond will be for you.

### Comparing apples to oranges

To make sure you're not comparing apples to oranges, you can apply a simple formula that involves your federal marginal tax rate (the income tax rate you pay on the last dollar of your yearly income). The formula depends on whether you want to know the taxable equivalent of a tax-free bond, or the tax-free equivalent of a taxable bond. Calculating the taxable equivalent of a tax-free bond requires subtracting your marginal tax rate from 1, then dividing the tax-free bond's annual yield by the result. To calculate the tax-free equivalent of a taxable bond, you subtract your tax rate from 1, then multiply it by the taxable bond's yield.

If a taxable bond also is subject to state and local taxes and the tax-exempt isn't, the tax-equivalent yield on the tax-free bond could be even lower and still come out ahead.

A financial professional can help you compare taxable and tax-free bonds, and evaluate how to maximize the benefits of both.

Which Bond Is Best For You?				
	\$5,000 taxable bond paying 5% interest			\$5,000 municipal bond paying 3.5% interest
	Federal tax bracket			(Federal tax bracket not applicable)
	28%	33%	35%	
<b>Annual interest</b>	\$250	\$250	\$250	\$175
<b>Paid in taxes</b>	\$70	\$82.50	\$87.50	\$0
<b>Net income</b>	\$180	\$167.50	\$162.50	\$175

This hypothetical example is intended only as an illustration and does not reflect the return of any specific portfolio.

## What's Taxable, What's Not

Comparing taxable and tax-free yields involves making sure you understand a bond's tax status. The interest on corporate bonds is taxable by local, state, and federal governments. However, interest on bonds issued by state and local governments--generally called municipal bonds, or munis--generally is exempt from federal income tax. If you live in the state in which a specific muni is issued, it may also be tax free at the state or local level.

Unlike munis, the income from Treasury securities, which are issued by the U.S. government, is exempt from state and local taxes but not from federal taxes. The general principle is that federal and state/local governments can impose taxes on their own level, but not at the other level; for example, states can tax securities of other states but not those of the federal government, and vice versa.



As is true of almost anything that's tax-related, munis can get complicated. A bond's tax-exempt status applies only to the interest paid on the bond; capital gains realized from any increases in the bond's value are taxable when the bond is sold.

### When are munis taxable?

Specific muni issues may be subject to federal income tax, depending on how the bond issuer will use the proceeds. If a bond finances a project that offers a substantial benefit to private interests, it is taxable at the federal level unless specifically exempted. For example, even though a new football stadium may serve a public purpose locally, it will provide little benefit to federal taxpayers. As a result, a muni bond that finances it is considered a so-called private-purpose bond.

Also known as private activity bonds or nonessential function bonds, taxable munis are those in which 10% or more of the bond's benefit goes to private activities, or 5% of the proceeds (or \$5 million if less)

#### **Exempt from federal taxes**

- *State and local government bonds*

#### **Exempt from state taxes**

- *U.S. Treasury securities*
- *Some government-sponsored enterprise (GSE) bonds*

#### **Not tax-exempt**

- *Ginnie Mae, Fannie Mae, Freddie Mac*

are used for loans to parties other than government units. Other publicly financed projects whose bonds may be federally taxable include housing, student loans, industrial development, and airports.

Even though such bonds are subject to federal tax, they still can have some advantages. For example, they may be exempt from state or local taxes. And you may find that yields on such taxable municipal bonds are closer to those of corporate bonds than they are to tax-free bonds.

Agencies and GSEs (government-sponsored enterprises) vary in their tax status. Interest paid by Ginnie Mae, Fannie Mae, and Freddie Mac bonds is fully taxable at federal, state, and local levels. The bonds of other GSEs, such as the Federal Farm Credit Banks, Federal Home Loan Banks and the Resolution Funding Corp. (REFCO), are subject to federal tax but exempt from state and local taxes. Before buying an agency bond, verify its tax status.

### Don't forget the AMT

To further complicate matters, interest from private-purpose bonds may be specifically exempted from regular federal income tax, but still may be a factor in determining whether the alternative minimum tax (AMT) applies to you. Even if you are not subject to the AMT when you purchase a bond, more people are feeling its impact each year, and the interest from a private-purpose bond could change your status. A financial professional can evaluate a bond's potential impact on your AMT liability.

### Pay attention to muni bond funds

Just because you've invested in a municipal bond fund doesn't mean the income you receive is automatically tax-free. Some funds invest in both public-purpose and private-purpose munis. Those that do must disclose on their yearly 1099 forms how much of the tax-free interest they pay is subject to AMT. If you own a muni bond fund, review this information periodically, especially if you aren't yet subject to the AMT but think you might soon be.

### Use a tax advantage where it counts

Be careful not to make a mistake that is common among people who invest through a tax-deferred account, such as an IRA. Because those accounts automatically provide a tax advantage, you receive no additional benefit by investing in tax-free bonds within them. By doing so, you may be needlessly forgoing a higher yield from a taxable bond. Tax-free munis are best held in taxable accounts.



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