

**Interest rates and bonds.** It's important to remember that investors don't always buy newly issued bonds, and depending on market conditions, these bonds can be purchased at a discount, par (even value), or at premium. As you would guess, bond prices do fluctuate and change daily, much like other securities. The key question is, "What causes the change in bond prices?" Although there are a host of factors that play a role in the [valuation of a bond](#), interest rates are arguably the most important factor in determining a bond's price.

It's important to understand that bonds and interest rates have an inverse relationship, meaning that when interest rates go up, existing bond prices go down, and when interest rates are low, bond prices are high. To demonstrate the reason behind the inverse relationship, you'll need to understand the concept of yield.

**Bond yield.** Simply stated, yield is the amount of return that an investor will realize on a bond. It's important to remember that a bond's yield to maturity is inverse to its price. As a bond's price increases, its yield to maturity falls. For example, if you purchased a [bond](#) with a par (face) value of \$100, and a 10 percent annual coupon rate, its yield would be the coupon rate divided by the par value ( $10/100 = 0.10$ ), or 10 percent. If the bond price fell to \$90, the yield would become ( $10/90 = 0.11$ ) or 11 percent. The bondholder would still receive the same amount of interest, because the coupon rate is based on the bond's par value. As you can see, the yield increased because the bond's price fell.

Though this is a very simplistic explanation of yield, it's important to illustrate the concept. There are several types of yield calculations, with yield to maturity being one of the more common. The yield-to-maturity calculation incorporates the bond's current market price, par value, coupon interest rate and time to maturity. In this calculation, it's assumed that all coupon payments are reinvested at the same rate as the bond's current yield.

**So what do interest rates have to do with it?** One of the easiest ways to see this concept in action is to consider the value of a zero-coupon bond in a variable interest rate environment. A zero-coupon bond means that the bond doesn't distribute interest payments during the lifetime of the bond. Here the bond yield is determined by the difference between the purchase price and the par value of the bond when it reaches maturity. [inRead](#) To keep the math easy, we'll start with a bond that has a market value of \$970, but a par value of \$1,000, meaning that if you buy and hold that bond until it reaches maturity, you'll receive a 3 percent return on that [bond investment](#). The calculation would look like  $(1,000-970)/970 = .0309$  or 3 percent.

Keep in mind this is a very basic calculation and is meant to only to demonstrate a concept. The majority of bond calculations will involve interest rates, coupon rates, payments and frequencies along with other factors which increase the calculation's complexity.

Going back to the example above, if you received a 3 percent return with little risk, that isn't too bad, right? Well, we'll see that rate of return is also contingent on other market factors. In general, investors are always seeking the highest rate of return for each unit of risk they take on. If current interest rates were to rise to 5 percent, then owning a zero-coupon bond that is only yielding 3 percent becomes less attractive. The demand for the 3 percent bond drops significantly. To increase demand for the existing bond, the price would have to drop even further to raise the bond yield to the prevailing 5 percent level. In order to achieve a 5 percent yield, the price would drop to around \$952. Conversely, it's easy to see that if interest rates dropped to 1 percent, then the existing bond with a yield of 3 percent looks more attractive. In this case, more people would buy the existing bond, pushing the price up until the bond's yield matched the prevailing 1 percent rate. In this case it would push the bond price up around \$990. Because of the inverse relationship between bond prices and yields, you can see how the price adjusts, and why bondholders benefit from a decrease in prevailing interest rates. The question you have to ask yourself is, "Do I think interest rates are going down anytime soon?"

**An example would look like this.** Another way to see this relationship in action is to add on a coupon (interest) rate. For example, Matt and Amy have been following the news and notice that the MG Corporation is raising capital by issuing bonds. The MG Corporation bonds have a par value of \$1,000, mature in four years (you'll receive that par value of the bond at that time), and paying a

coupon rate of 4 percent annually. That means you'll receive \$40 a year or \$160 over the lifetime of the bond, if you hold the bond until maturity.

This all sounds good to Matt, so he decides to [buy the bond](#). Amy decides to hold off, because she thinks that interest rates will rise in the next few weeks, and for this example, she's right. The MG bond is now offering a coupon rate of 5 percent, meaning that Amy will receive \$50 dollars annually, if she decides to go ahead and purchase bonds at this time.

Now, Amy has a decision to make. She can either buy the MG Corporation bond for \$1,000 at 5 percent, or she can buy Matt's bond at a reduced price, because why would she pay \$1,000 for a 4 percent coupon rate? She wouldn't, so she could purchase Matt's bond at a discount. It's also important to remember that investors don't always buy bonds, because of the fluctuations in yield. So here is where the yield-to-maturity rate comes into play. Plugging the numbers into the yield-to-maturity rate calculation, Amy could purchase Matt's bond at a discounted rate of \$965. As you would guess, if interest rates decreased to 2 percent and Matt wanted to sell his bond, his could sell at a premium or above par value. This is just another way to illustrate the inverse relationships between interest rates and bond prices, and remind you to consider the ups and downs before jumping into the bond market.

The Federal Reserve decided to keep purchasing \$25 billion of U.S. Treasuries per month, thereby keeping [interest rates](#) artificially low. If the Federal Reserve keeps to its word and continues to taper its Treasury purchases in order to stop purchases altogether, it is likely that interest rates will rise, thereby making existing Treasuries drop in value. The Federal Reserve has stated that they look to end their purchasing program in October of this year, at which point we imagine that rates could reach a "natural" rate. Based on this outlook we are not investing in long term Treasuries for our clients at the moment and instead are opting for shorter duration and high yield funds that offer a better alternative.

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