

Bond basics



Wealth
Management

Often considered to be one of the most conservative of all investments, bonds actually provide benefits to both conservative and more aggressive investors alike. The variety of bonds available provides an array of options to meet many investment goals, from earning regular income to achieving capital appreciation much like stocks. To understand these benefits, it is important to understand how bonds work. This fact sheet explains the fundamentals of bonds, addressing: how bonds are structured and priced; what factors affect prices; how to measure return; types of bonds; bond risks; and bond taxation. By learning about these bond basics, you'll be on your way to understanding how bonds can contribute to your investment goals.

Bonds defined

In the financial world, there are fundamentally two types of security investments: debt and equity. Issuing debt (bonds) is an important way for different types of issuers to raise money to fund projects or build capital. The most common bond issuers include: federal governments, federal agencies, municipalities, and corporations. While all of these entities can issue debt (bonds), only a corporation can issue equity (stock).

One of the key ways in which bonds differ from stock relates to the issuer's obligation to the investor. When an investor buys stock in a corporation, that investor becomes a partial owner. The stock offers the possibility of capital appreciation and dividend payments to the stockholder, with no guarantee that either of these will occur.

A bond, on the other hand, makes a promise of return to the bondholder. The issuer agrees to pay the bondholder a fixed interest payment on a regular basis until the bond's maturity, at which point the issuer will pay the original face value of the bond. A bond certificate, in essence, is simply a promissory note or "IOU", which legally binds the issuer

to repay the amount paid per the IOU and describes the terms of the loan. As a creditor of the issuer, the bondholder has a senior claim on the liquidation of assets over stockholders if the issuer were to file bankruptcy.

Bonds, in the most generic sense, are issued with three essential components.

- **Maturity** — Maturity indicates the life of the bond. Most bonds have maturities ranging from 3 months to 30 years.
- **Par value** — Par value, also called face value, is the amount the bondholder will be repaid when the bond reaches maturity. For instance, if you purchase a \$1,000 par value bond, you will receive \$1,000 at maturity.
- **Coupon rate** — Coupon rate (also referred to as interest rate) is the percentage of par value that will be paid to bondholders on a regular basis. For example, if you purchase a \$1,000 par value bond with a 10% coupon rate you will receive \$100 interest each year.

Characterized by fixed interest payments and a return of principal at maturity, bonds are commonly referred to as fixed income securities.

Why buy bonds?

Investors purchase bonds to take advantage of their many benefits compared to alternative investments.

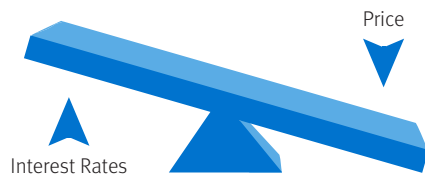
- **Safety/capital preservation** — Because the bond issuer must pay back the bond's face value at maturity, an investor's original principal is preserved, unlike stock where the investor can lose the original investment value. The degree of safety varies with bonds of different types and ratings.
- **Fixed return** — Investors receive fixed, regular interest payments which provide an element of predictability versus common stocks where the returns are less certain.
- **Current income** — For those wanting a regular cash income, bonds provide regular interest payments at set times.
- **Reduce portfolio risk** — Due to their more certain nature compared to equities and their divergent behavior in tumultuous markets, bonds are a great way to reduce the risk in an investment portfolio.
- **Capital appreciation** — Many investors benefit from trading bonds in the secondary market to take advantage of price increases, much the same way as they would trade stocks.

How is the bond's coupon rate determined?

A bond's coupon rate is determined when the issuer first creates the bond offering and sells it in the new issue market, commonly called the primary market. A number of factors influence the level of a bond's coupon rate. The main factor is the level of interest rates prevalent in the economy, in general, and more specifically interest rates prevailing for bonds of the same credit quality and structure. For instance, investors will demand a higher coupon for a corporate bond rated single A relative to a U.S government bond to compensate for the lower credit quality of the corporate bond. Another factor influencing the coupon rate includes the length of the bond's maturity with longer-term bonds normally posting higher coupon rates than shorter maturities.

How is the bond's price determined?

After a bond is first issued in the primary market, it becomes part of the secondary market — composed of buyers and sellers of outstanding securities. The bond's price will fluctuate in the secondary market above or below the original issue price to reflect changing market conditions. However, purchasers of the original issue don't need to fret about price movements of their bonds because such fluctuations won't affect the payback of the bondholder's original principal amount at maturity, the par value. This return of principal, regardless of price volatility, is one of the key benefits of holding bonds. Many investors, however, have learned to capitalize on bond price movements by trading bonds and realizing gains on price appreciation, as they might with common stock. To do this, investors need to understand the combination of factors which drive bond price movements; the main determinants are interest rate movements; credit quality; length to maturity; call features; and supply and demand factors.



Interest rate levels

The most important cause of bond price fluctuations is the changing level of interest rates. As illustrated below, when interest rates in the market rise, a bond's price will fall. Conversely, if interest rates fall, a bond's price will rise. For example, suppose that you purchase a 3% coupon bond of ABC Company at its primary issue price, the par value of \$1,000. Assume that two years from now the bond is trading in the secondary issue market. At this point, market interest rates have fallen and new bonds similar to yours are being issued at a par price of \$1,000, but are paying only a 2% coupon rate consistent with market conditions. Understandably, other buyers in the market would be willing to pay a premium, more than \$1,000, for your bond that has the higher 3% coupon rate. Therefore this bond's price will increase to reflect prevailing rates; this bond trades at a premium price. If you sold your premium bond, you would have a gain on your original purchase.

Consider the opposite case. Two years from now, interest rates have risen and a new bond selling for \$1,000 is paying an 4% coupon rate. It would be impossible to sell your bond for \$1,000 if

it is only paying a 3% coupon rate when new bonds are offering a higher rate of interest. In order to sell your bond, you will have to offer it at a discount to entice a buyer to buy your bond. If you sold your discount bond, you would register a loss from your original purchase price of par value.

Credit quality

Changes in an issuer's credit quality will also affect the price of its bonds. This factor is most common with non-U.S. government issuers such as corporate and municipal issuers. An issuer's credit quality is evaluated according to its ability to make timely principal and interest payments to bondholders. Bonds are evaluated for credit risk based on the financial performance of the issuer, both past and present. The major rating agencies for bonds are Standard & Poor's and Moody's Investors Service. Issuers pay these credit rating agencies a fee to rate both their financial performance as well as the likelihood that the issuer will be able to meet future debt obligations. This credit rating influences the price at which an issuer must compensate an investor for the risk involved in loaning money to their company.

Investment grade bonds (ratings in the beige region of the table below) are those bonds whose risk of defaulting on interest and principal payments is modest, based on evaluating the

Corporate bond ratings

Definition	Moody's	Standard & Poor's
Highest and strongest rating assigned	Aaa	AAA
High quality by all standards, differs from highest grade only by a small degree	Aa	AA
Upper medium grade with a strong capacity to pay, but somewhat susceptible to impairment given adverse economic conditions	A	A
Medium grade with adequate capacity to pay principal and interest — neither highly protected nor poorly secured	Baa	BBB
Speculative issue with only moderate payment potential	Ba, B	BB, B
Poor quality issues that may be in danger of default, or in default, highly speculative	Caa, Ca	CCC, CC, C
Lowest rated class and is in default	C	C, D

issuer's current and projected financial performance. Bonds rated below investment grade, sometimes referred to as "high yield bonds" (ratings in the blue region), are from issuers whose current financial position is either speculative or uncertain in their ability to make principal and interest payments. Bonds which are rated below investment grade typically have higher coupon rates because companies must compensate investors with a higher return for taking on extra risk.

It is important to note that Treasury securities are not rated, because they are considered to be free of credit risk. Treasuries are backed by the full faith and credit of the United States government, which guarantees the repayment of principal and interest. Most government agencies are also not formally rated but have an implied AAA rating.

Length to maturity

With any given change in interest rates, bonds with longer maturities will tend to have larger price swings compared to shorter maturity bonds.

Call structure

Some bonds have a call feature which allows the issuer to redeem or call the bonds at a predetermined schedule. The structure of this call feature will influence a bond's price, depending on when the call is scheduled and the price at which the issuer can implement the call.

Supply and demand factors

At any point in time a bond's price may be driven by excess supply or demand factors for the particular bond or bond class.

Measuring a bond's return

After a bond has been initially issued in the primary market, investors are free to trade the bond in the secondary market. At this point, the bond's price begins to fluctuate. The market price will adjust to reflect a bond's yield to maturity.

Yield to maturity (YTM)

A bond's yield to maturity measures the rate of return of the bond, taking

into account the total annual interest payments, any profit or loss that will occur when the bond matures, and the number of years left until maturity. We make two important assumptions when referring to yield to maturity as a bond's rate of return. The first assumption is that all interest payments received will be reinvested at the yield to maturity rate. Secondly, we assume that the bond is held until maturity. While these assumptions are sometimes considered unrealistic, yield to maturity is still a good comparative measure when evaluating different bond investments.

If you purchase a bond in the primary market with a price at par, the bond's coupon rate will equal its yield to maturity. This is because the bond's purchase price is the same as its maturity value, so you will be earning the coupon rate every year on the original par value. However, if you purchase the bond in the secondary market, you will frequently be purchasing it at a price less than or greater than par value, although the coupon rate will always stay the same. In this case the yield to maturity would vary from the coupon rate.

As illustrated in the chart below that highlights a ten-year issue, when the bond is first issued the coupon rate of 3% matches the yield to maturity as well as the general level of interest rates. However, if you purchased the same bond after one year when the general interest rate level has dropped to 2%, the bond's price would have risen to \$1,082 which resulted in a yield to maturity of 2% to match the change in interest rates for similar bonds. If interest rates had instead risen to 4%, you could purchase the same bond at \$925 to yield 4%, again to match the new level of interest rates.

While this apparent "perfect" relationship between prices and yields will not be exact, the general rule applies that when purchasing a bond in the secondary market; the bond's price will adjust to reflect the general level of interest rates at that time.

Yield to call (YTC)

Yield to maturity is a good measure of a bond's return, unless it was issued with a call feature. A call feature gives the issuer the right to redeem or "call" the bond prior to maturity at a price which may be different from par value. Issuers create bonds with a call feature so that if interest rates decline, the issuer can redeem the callable issue and issue new bonds at a lower coupon rate. For bonds with a call feature, the bond's yield to call is an important measure of return because it takes into account the shortened time period. If a bond is bought at a premium to the par value, the yield to call will normally be lower than it would be if the bond were allowed to mature. And if the bond was bought at a discount to the par value, the yield to call will be higher.

Yield to worst (YTW)

The lower of yield to maturity and yield to call is referred to as yield to worst.

Current yield

The current yield is to bonds what the dividend yield is to stocks. It measures the current income an investor receives in relation to the current price of the bond. The current yield is calculated by taking the bond's yearly coupon payments and dividing it by the bond's price. Because the current yield does not account for any gain or loss when the bond is sold or matures, it is most appropriate for persons concerned

Relationship of interest rates to bond prices

Time period	Coupon	Interest rate level	Yield to maturity	Price
New issue	3.00%	3.00%	3.00%	\$1,000
1 Year later	3.00%	2.00%	2.00%	\$1,082
1 Year later	3.00%	4.00%	4.00%	\$ 925

about maximizing current income. In addition, the current yield helps an investor evaluate bonds of equivalent yield with different coupon rates.

Types of bonds

The following describes the major categories of bonds issued:

- **Federal government bonds** — U.S. government bonds are issued by the Treasury and help finance various federal operations.
- **Federal agency bonds** — Federal agencies issue bonds, many of which are indirect obligations of the U.S. government, to support financing specific to their own operations. The most well-known agencies support home financing, education and public power facilities.
- **Municipal bonds** — Municipalities such as states, cities, counties, and towns issue bonds to fund a variety of publicly beneficial projects, which include building and operating schools, roads, sewer systems, and convention centers.
- **Mortgage-backed securities** — As a way to provide funding to the mortgage market, certain federal agencies and some private organizations issue bonds backed by groups of mortgages and deriving payments from the underlying mortgage payments.
- **Corporate bonds** — Many corporations raise money through the issuance of debt. The funds raised through bonds are often used for modernization, expansions, new product ideas or financing operating expenses. Corporations can issue two types of debt — secured and unsecured. Bonds that are secured have a pledge of collateral backing the original principal amount. Unsecured bonds, called debentures, have no collateral backing so they rely solely on the issuer's ability to repay principal and make timely interest payments.

Risks of investing in bonds

As with any type of financial investment, bonds include some degree of risk. Determining your risk tolerance is a crucial element to consider when investing in bonds and developing a portfolio strategy.

Credit risk/credit ratings

Credit risk is the risk associated with the issuer's ability to make timely principal and interest payments to its creditors.

The U.S. government is considered to have the least credit risk of all bond issuers. Federal agencies have only somewhat greater credit risk than the U.S. government, due to the close relationship these agencies enjoy with the government. Corporate and municipal bonds are rated by the two major credit ratings agencies — Moody's and Standard & Poor's — on an "alphabetical" scale. While these two agency's ratings are very similar, they are not identical.

Interest rate risk

Interest rate risk, also referred to as market risk, is the risk that rising interest rates will cause a bond's price to fall and decrease the value of an investment. However, how much a bond's price will move for any 1% change in interest rates will depend on many factors such as its credit risk, time to maturity, coupon rate, and supply and demand conditions.

Bonds that have longer maturities or lower coupon rates have a greater percentage change in their price with a move in interest rates. Bonds that have shorter maturities and higher coupon rates tend to have more price stability.

- **Marketability risk** — The risk that the bond will be difficult to sell, which affects some classes of bonds more than others.

- **Call risk** — The risk that an issuer may redeem a bond earlier than its original maturity date. This risk is more relevant during periods of declining interest rates.
- **Purchasing power risk** — The risk that inflation will lower the value of a bond's principal and interest payments.
- **Reinvestment risk** — The risk that as coupon payments are received on a bond, they must be reinvested at lower interest rates.

Taxation of bonds

Interest income earned on bonds is taxed differently depending on the type of bond. In most cases, municipal bonds are federally tax-exempt. Additionally, a state tax exemption may be available to in-state purchasers. U.S. government bonds, while subject to federal taxation, may be exempt from state and local taxes. Federal agency bonds are taxed at the federal level; some are exempt from state taxes. Corporate bonds are subject to both federal and state taxes.