

Everything You Need to Know About Bonds

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What is a bond?

The bond market is by far the largest securities market in the world, providing investors with virtually limitless investment options. Many investors are familiar with aspects of the market, but as the number of new products grows, even a bond expert is challenged to keep pace. Once viewed as a means of earning interest while preserving capital, bonds have evolved into a \$90 trillion global marketplace that can offer many potential benefits to investment portfolios, including attractive returns.

Before tackling the complexities of this huge and diverse market, it is important to understand the basics: What is a bond and how can bonds help meet your investment goals?

What makes a bond a bond?

A bond is a loan that the bond purchaser, or bondholder, makes to the bond issuer. Governments, corporations and municipalities issue bonds when they need capital. An investor who buys a government bond is lending the government money. If an investor buys a corporate bond, the investor is lending the corporation money. Like a loan, a bond pays interest periodically and repays the principal at a stated time, known as maturity.

Suppose a corporation wants to build a new manufacturing plant for \$1 million and decides to issue a bond offering to help pay for the plant. The corporation might decide to sell 1,000 bonds to investors for \$1,000 each. In this case, the “face value” of each bond is \$1,000. The corporation – now referred to as the bond issuer – determines an annual interest rate, known as the coupon, and a timeframe within which it will repay the principal, or the \$1 million. To set the coupon, the issuer takes into account the prevailing interest-rate environment to ensure that the coupon is competitive with those on comparable bonds and attractive to investors. The issuer may decide to sell five-year bonds with an annual coupon of 5%. At the end of five years, the bond reaches maturity and the corporation repays the \$1,000 face value to each bondholder.

How long it takes for a bond to reach maturity can play an important role in the amount of risk as well as the potential return an investor can expect. A \$1 million bond repaid in five years is typically regarded as less risky than the same bond repaid over 30 years because many more factors can have a negative impact on the issuer's ability to pay bondholders over a 30-year period relative to a 5-year period. The additional risk incurred by a longer maturity bond has a direct relation to the interest rate, or coupon, the issuer must pay on the bond. In other words, an issuer will pay a higher interest rate for a long-term bond. An investor therefore will potentially earn greater returns on longer-term bonds, but in exchange for that return, the investor incurs additional risk.

Every bond also carries some risk that the issuer will “default,” or fail to fully repay the loan. Independent credit rating services assess the default risk, or credit risk, of bond issuers and publish credit ratings that not only help investors evaluate risk but also help determine the interest rates on individual bonds. An issuer with a high credit rating will pay a lower interest rate than one with a low credit rating. Again, investors who purchase bonds with low credit

ratings can potentially earn higher returns, but they must bear the additional risk of default by the bond issuer.

What determines the price of a bond in the open market?

Bonds can be bought and sold in the “secondary market” after they are issued. While some bonds are traded publicly through exchanges, most trade over the counter between large broker-dealers acting on their clients’ or their own behalf.



A bond’s price and yield determine its value in the secondary market. Obviously, a bond must have a price at which it can be bought and sold (see “Understanding Bond Market Prices” below for more), and a bond’s yield is the actual annual return an investor can expect if the bond is held to maturity. Yield is therefore based on the purchase price of the bond as well as the coupon.

A bond’s price always moves in the opposite direction of its yield, as illustrated above. The key to understanding this critical feature of the bond market is to recognize that a bond’s price reflects the value of the income that it provides through its regular coupon interest payments. When prevailing interest rates fall – notably rates on government bonds – older bonds of all types become more valuable because they were sold in a higher interest-rate environment and therefore have higher coupons. Investors holding older bonds can charge a “premium” to sell them in the secondary market. On the other hand, if interest rates rise, older bonds may become less valuable because their coupons are relatively low, and older bonds therefore trade at a “discount.”

Understanding bond market prices

In the market, bond prices are quoted as a percent of the bond’s face value. The easiest way to understand bond prices is to add a zero to the price quoted in the market. For example, if a bond is quoted at 99 in the market, the price is \$990 for every \$1,000 of face value and the bond is said to be trading at a discount. If the bond is trading at 101, it costs \$1,010 for every \$1,000 of face value and the bond is said to be trading at a premium. If the bond is trading at 100, it costs \$1,000 for every \$1,000 of face value and is said to be trading at par. Another common term is “par value,” which is simply another way of saying face value. Most bonds are issued slightly below par and can then trade in the secondary market above or below par, depending on interest rate, credit or other factors.

Face Value:	Price Quoted As:	Market Price:	The Bond is Trading at:
\$1,000	100	\$1,000	Par
\$1,000	102	\$1,020	A premium to par
\$1,000	97	\$970	A discount to par
\$5,000	99	\$4,950	A discount to par

Put simply, when interest rates are rising, new bonds will pay investors higher interest rates than old ones, so old bonds tend to drop in price. Falling interest rates, however, mean that older bonds are paying higher interest rates than new bonds, and therefore older bonds tend to sell at premiums in the market.

On a short-term basis, falling interest rates can boost the value of bonds in a portfolio and rising rates may hurt their value. However, over the long term, rising interest rates can actually increase a bond portfolio's return as the money from maturing bonds is reinvested in bonds with higher yields. Conversely, in a falling interest rate environment, money from maturing bonds may need to be reinvested in new bonds that pay lower rates, potentially lowering longer-term returns.

Measuring bond risk: What is duration?

The inverse relationship between price and yield is crucial to understanding value in bonds. Another key is knowing how much a bond's price will move when interest rates change.

To estimate how sensitive a particular bond's price is to interest rate movements, the bond market uses a measure known as duration. Duration is a weighted average of the present value of a bond's cash flows, which include a series of regular coupon payments followed by a much larger payment at the end when the bond matures and the face value is repaid, as illustrated below.



Duration, like the maturity of the bond, is expressed in years, but as the illustration shows, it is typically less than the maturity. Duration will be affected by the size of the regular coupon payments and the bond's face value. For a zero coupon bond, maturity and duration are equal since there are no regular coupon payments and all cash flows occur at maturity. Because of this feature, zero coupon bonds tend to provide the most price movement for a given change in interest rates, which can make zero coupon bonds attractive to investors expecting a decline in rates.

The end result of the duration calculation, which is unique to each bond, is a risk measure that allows investors to compare bonds with different maturities, coupons and face values on an apples-to-apples basis. Duration provides the approximate change in price that any

given bond will experience in the event of a 100 basis point (one percentage point) change in interest rates. For example, suppose that interest rates fall by 1%, causing yields on every bond in the market to fall by the same amount. In that event, the price of a bond with a duration of two years will rise 2% and the price of a five-year duration bond will rise 5%.

The weighted average duration can also be calculated for an entire bond portfolio, based on the durations of the individual bonds in the portfolio.

The role of bonds in a portfolio

Since governments began to issue bonds more frequently in the early twentieth century and gave rise to the modern bond market, investors have purchased bonds for several reasons: capital preservation, income, diversification and as a potential hedge against economic weakness or deflation. When the bond market became larger and more diverse in the 1970s and 1980s, bonds began to undergo greater and more frequent price changes and many investors began to trade bonds, taking advantage of another potential benefit: price, or capital, appreciation. Today, investors may choose to buy bonds for any or all of these reasons.

Capital preservation: Unlike equities, bonds should repay principal at a specified date, or maturity. This makes bonds appealing to investors who do not want to risk losing capital and to those who must meet a liability at a particular time in the future. Bonds have the added benefit of offering interest at a set rate that is often higher than short-term savings rates.

Income: Most bonds provide the investor with “fixed” income. On a set schedule, whether quarterly, twice a year or annually, the bond issuer sends the bondholder an interest payment, which can be spent or reinvested in other bonds. Stocks can also provide income through dividend payments, but dividends tend to be smaller than bond coupon payments, and companies make dividend payments at their discretion, while bond issuers are obligated to make coupon payments.

Capital appreciation: Bond prices can rise for several reasons, including a drop in interest rates and an improvement in the credit standing of the issuer. If a bond is held to maturity, any price gains over the life of the bond are not realized; instead, the bond’s price typically reverts to par (100) as it nears maturity and repayment of the principal. However, by selling bonds after they have risen in price – and before maturity – investors can realize price appreciation, also known as capital appreciation, on bonds. Capturing the capital appreciation on bonds increases their total return, which is the combination of income and capital appreciation. Investing for total return has become one of the most widely used bond strategies over the past 40 years. (For more, see “Bond Investment Strategies”.)

Diversification: Including bonds in an investment portfolio can help diversify the portfolio. Many investors diversify among a wide variety of assets, from equities and bonds to commodities and alternative investments, in an effort to reduce the risk of low, or even negative, returns on their portfolios.

Potential hedge against economic slowdown or deflation: Bonds can help protect investors against an economic slowdown for several reasons. The price of a bond depends on how much investors value the income the bond provides. Most bonds pay a fixed income that doesn’t change. When the prices of goods and services are rising, an

economic condition known as inflation, a bond's fixed income becomes less attractive because that income buys fewer goods and services. Inflation usually coincides with faster economic growth, which increases demand for goods and services. On the other hand, slower economic growth usually leads to lower inflation, which makes bond income more attractive. An economic slowdown is also typically bad for corporate profits and stock returns, adding to the attractiveness of bond income as a source of return.

If the slowdown becomes bad enough that consumers stop buying things and prices in the economy begin to fall – a dire economic condition known as deflation – then bond income becomes even more attractive because bondholders can buy more goods and services (due to their deflated prices) with the same bond income. As demand for bonds increases, so do bond prices and bondholder returns.

The Many Different Kinds of Bonds

In the 1970s, the modern bond market began to evolve. Supply increased and investors learned there was money to be made by buying and selling bonds in the secondary market and realizing price gains.

Until then, however, the bond market was primarily a place for governments and large companies to borrow money. The main investors in bonds were insurance companies, pension funds and individual investors seeking a high quality investment for money that would be needed for some specific future purpose.

As investor interest in bonds grew in the 1970s and 1980s, (and faster computers made bond math easier), finance professionals created innovative ways for borrowers to tap the bond market for funding and new ways for investors to tailor their exposure to risk and return potential. The U.S. has historically offered the deepest bond market, but Europe has expanded greatly since the introduction of the euro in 1999, and developing countries undergoing strong economic growth in the 2000s have become integrated into what is now a global bond marketplace.

Broadly speaking, government bonds and corporate bonds remain the largest sectors of the bond market, but other types of bonds, including mortgage-backed securities, play crucial roles in funding certain sectors, such as housing, and meeting specific investment needs.

Government bonds

The government bond sector is a broad category that includes “sovereign” debt, which is issued and generally backed by a central government. Government of Canada Bonds (GoCs), U.K. Gilts, U.S. Treasuries, German Bunds, Japanese Government Bonds (JGBs) and Brazilian Government Bonds are all examples of sovereign government bonds. The U.S., Japan and Europe have historically been the biggest issuers in the government bond market.

A number of governments also issue sovereign bonds that are linked to inflation, known as inflation-linked bonds or in the U.S., Treasury Inflation Protected Securities (TIPS). On an inflation-linked bond, the interest and/or principal is adjusted on a regular basis to reflect changes in the rate of inflation, thus providing a “real,” or inflation-adjusted, return. But, unlike other bonds, inflation-linked bonds could experience greater losses when real interest rates are moving faster than nominal interest rates.

In addition to sovereign bonds, the government bond sector includes subcomponents, such as:

- Agency and “Quasi-Government” Bonds: Central governments pursue various goals – supporting affordable housing or the development of small businesses, for example – through agencies, a number of which issue bonds to support their operations. Some agency bonds are guaranteed by the central government while others are not. Supranational organizations, like the World Bank and the European Investment Bank also borrow in the bond market to finance public projects and/or development.
- Local Government Bonds: Local governments – whether provinces, states, or cities – borrow to finance a variety of projects, from bridges to schools, as well as general operations. The market for local government bonds is well established in the U.S., where these bonds are known as municipal bonds. European local government bond issuance has grown significantly in recent years. In the U.S., municipal bonds (munis) may enjoy a tax advantage over other bonds because interest on many municipal bonds is exempt from federal taxes, and when states issue bonds, interest may be tax-exempt for state residents. However, capital gains on U.S. munis are not tax exempt, and income from portfolios that invest in munis may be subject to state and local taxes and, possibly, the alternative minimum tax.

Corporate bonds

After the government sector, corporate bonds have historically been the largest segment of the bond market. Corporations borrow money in the bond market to expand operations or fund new business ventures. The corporate sector is evolving rapidly, particularly in Europe and many developing countries.

Corporate bonds fall into two broad categories: investment-grade and speculative-grade (also known as high-yield or “junk”) bonds. Speculative-grade bonds are issued by companies perceived to have lower credit quality and higher default risk than more highly rated, investment-grade companies. Within these two broad categories, corporate bonds have a wide range of ratings, reflecting the fact that the financial health of issuers can vary significantly.

Speculative-grade bonds tend to be issued by newer companies, companies in particularly competitive or volatile sectors, or companies with troubling fundamentals. While a speculative-grade credit rating indicates a higher default probability, higher coupons on these bonds aim to compensate investors for the higher risk. Ratings can be downgraded if the credit quality of the issuer deteriorates or upgraded if fundamentals improve.

Emerging markets bonds

Sovereign and corporate bonds issued by developing countries are also known as emerging markets (EM) bonds. Since the 1990s, the emerging markets asset class has developed and matured to include a wide variety of government and corporate bonds, issued in major external currencies, including the U.S. dollar and the euro, and local currencies (often referred to as emerging local markets bonds). Because they come from a variety of countries, which may have different growth prospects, emerging markets bonds can help diversify an investment portfolio and can provide potentially attractive risk-adjusted returns.

Mortgage-backed and asset-backed securities

Another major area of the global bond market comes from a process known as “securitization,” in which the cash flows from various types of loans (mortgage payments, car payments or credit card payments, for example) are bundled together and resold to investors as bonds. Mortgage-backed securities and asset-backed securities are the largest sectors involving securitization.

Mortgage-Backed Securities (MBS): These bonds are created from the mortgage payments of residential homeowners. Mortgage lenders, typically banks and finance companies, sell individual mortgage loans to another entity that bundles those loans into a security that pays an interest rate similar to the mortgage rate being paid by the homeowners. As with other bonds, mortgage-backed securities are sensitive to changes in prevailing interest rates and can decline in value when interest rates rise. Securities backed by fixed-rate mortgages, in particular, are sensitive to interest rates because borrowers may prepay and refinance their mortgages when rates drop, causing the securities backed by these loans to pay earlier than expected also. In part for this reason and also to appeal to different types of investors, mortgage-backed securities can be structured into bonds with specific payment dates and characteristics, known as collateralized mortgage obligations (CMOs).

Asset-Backed Securities (ABS): These bonds are securities created from car payments, credit card payments or other loans. As with mortgage-backed securities, similar loans are bundled together and packaged as a security that is then sold to investors. Special entities are created to administer asset-backed securities, allowing credit card companies and other lenders to move loans off of their balance sheets. Asset-backed securities are usually “tranching,” meaning that loans are bundled together into high quality and lower quality classes of securities. Asset-backed securities contain risks, including credit risk.

Pfandbriefe and Covered Bonds: German securities secured by mortgages are known as Pfandbriefe or, depending on the size of the offering, “Jumbo” Pfandbriefe. The Jumbo Pfandbrief market has historically been one of the largest sectors of the European bond market. The key difference between Pfandbriefe and mortgage-backed or asset-backed securities is that banks that make loans and package them into Pfandbriefe keep those loans on their books. Because of this feature, Pfandbriefe are sometimes classified as corporate bonds. Other countries in Europe are increasingly issuing Pfandbrief-like securities known as covered bonds.

The non-government bonds described above tend to be priced relative to government bond yields or the London Interbank Offered Rate (LIBOR). The difference between the yield on a non-government bond and the government bond yield or LIBOR rate is known as the “credit spread.” For example, a company with a slightly lower credit rating than its government might issue a bond with a yield or credit spread of 50 basis points (0.5%) over a government bond with the same maturity. Credit spreads adjust based on investor perceptions of credit quality and economic growth, as well as investor demand for risk and higher returns.

After an issuer sells a bond, it can be bought and sold in the secondary market, where prices can fluctuate depending on changes in economic outlook, the credit quality of the bond or issuer, and supply and demand, among other factors. Broker-dealers are the main buyers and sellers in the secondary market for bonds, and retail investors typically purchase bonds through them, either directly as a client or indirectly through mutual funds

and exchange-traded funds.

Bond Investment Strategies

Bond investors can choose from many different investment strategies, depending on the role or roles that bonds will play in their investment portfolios.

Passive investment strategies include buying and holding bonds until maturity and investing in bond funds or portfolios that track bond indexes. Passive approaches may suit investors seeking some of the traditional benefits of bonds, such as capital preservation, income and diversification, but they do not attempt to capitalize on the interest-rate, credit or market environment.

Active investment strategies, by contrast, try to outperform bond indexes, often by buying and selling bonds to take advantage of price movements. They have the potential to provide many or all of the benefits of bonds; however, to outperform indexes successfully over the long term, active investing requires the ability to form opinions on the economy, the direction of interest rates and/or the credit environment; trade bonds efficiently to express those views; and manage risk.

Passive strategies: Buy-and-hold approaches

Investors seeking capital preservation, income and/or diversification may simply buy bonds and hold them until they mature.

The interest rate environment affects the prices buy-and-hold investors pay for bonds when they first invest and again when they need to reinvest their money at maturity. Strategies have evolved that can help buy-and-hold investors manage this inherent interest-rate risk. One of the most popular is the bond ladder. A laddered bond portfolio is invested equally in bonds maturing periodically, usually every year or every other year. As the bonds mature, money is reinvested to maintain the maturity ladder. Investors typically use the laddered approach to match a steady liability stream and to reduce the risk of having to reinvest a significant portion of their money in a low interest-rate environment.



Another buy-and-hold approach is the barbell, in which money is invested in a combination of short-term and long-term bonds; as the short-term bonds mature, investors can reinvest to take advantage of market opportunities while the long-term bonds provide attractive coupon rates.

Other passive strategies

Investors seeking the traditional benefits of bonds may also choose from passive investment strategies that attempt to match the performance of bond indexes. For example, a core bond portfolio in the U.S. might use a broad, investment-grade index, such as the Barclays Capital U.S. Aggregate Index, as a performance benchmark, or guideline. Similar to equity indexes, bond indexes are transparent (the securities in it are known) and performance is updated and published daily.

Many exchange-traded funds (ETFs) and certain bond mutual funds invest in the same or similar securities held in bond indexes and thus closely track the indexes' performances. In these passive bond strategies, portfolio managers change the composition of their portfolios if and when the corresponding indexes change but do not generally make independent decisions on buying and selling bonds.

Active strategies

Investors that aim to outperform bond indexes use actively managed bond strategies. Active portfolio managers can attempt to maximize income or capital (price) appreciation from bonds, or both. Many bond portfolios managed for institutional investors, many bond mutual funds and an increasing number of ETFs are actively managed.

One of the most widely used active approaches is known as total return investing, which uses a variety of strategies to maximize capital appreciation. Active bond portfolio managers seeking price appreciation try to buy undervalued bonds, hold them as they rise in price and then sell them before maturity to realize the profits – ideally “buying low and selling high.” Active managers can employ a number of different techniques in an effort to find bonds that could rise in price.

- **Credit analysis:** Using fundamental, “bottom-up” credit analysis, active managers attempt to identify individual bonds that may rise in price due to an improvement in the credit standing of the issuer. Bond prices may increase, for example, when a company brings in new and better management.
- **Macroeconomic analysis:** Portfolio managers use top-down analysis to find bonds that may rise in price due to economic conditions, a favorable interest-rate environment or global growth patterns. For example, as the emerging markets have become greater drivers of global growth in recent years, many bonds from governments and corporate issuers in these countries have risen in price.
- **Sector rotation:** Based on their economic outlook, bond managers invest in certain sectors that have historically increased in price during a particular phase in the economic cycle and avoid those that have underperformed at that point. As the economic cycle turns, they may sell bonds in one sector and buy in another.
- **Market analysis:** Portfolio managers can buy and sell bonds to take advantage of changes in supply and demand that cause price movements.
- **Duration management:** To express a view on and help manage the risk in interest-rate changes, portfolio managers can adjust the duration of their bond portfolios. Managers anticipating a rise in interest rates can attempt to protect bond portfolios from a negative price impact by shortening duration, possibly by selling some longer-term bonds and buying short-term bonds. Conversely, to maximize the positive impact of an expected drop in interest rates, active managers can lengthen duration on bond portfolios.

- **Yield curve positioning:** Active bond managers can adjust the maturity structure of a bond portfolio based on expected changes in the relationship between bonds with different maturities, a relationship illustrated by the yield curve. While yields normally rise with maturity, this relationship can change, creating opportunities for active bond managers to position a portfolio in the area of the yield curve that is likely to perform the best in a given economic environment.
- **Roll down:** When short-term interest rates are lower than longer-term rates (known as a “normal” interest rate environment), a bond is valued at successively lower yields and higher prices as it approaches maturity or “rolls down the yield curve.” A bond manager can hold a bond for a period of time as it appreciates in price and sell it before maturity to realize the gain. This strategy has the potential to continually add to total return in a normal interest rate environment.
- **Derivatives:** Bond managers can use futures, options and derivatives to express a wide range of views, from the credit-worthiness of a particular issuer to the direction of interest rates.
- An active bond manager may also take steps to maximize income without increasing risk significantly, perhaps by investing in some longer-term or slightly lower rated bonds, which carry higher coupons.

Active vs. passive strategies

Investors have long debated the merits of active management, such as total return investing, versus passive management and ladder/barbell strategies. A major contention in this debate is whether the bond market is too efficient to allow active managers to consistently outperform the market itself. An active bond manager, such as PIMCO, would counter this argument by noting that both size and flexibility help enable active managers to optimize short- and long-term trends in efforts to outperform the market. Active managers can also manage the interest-rate, credit and other potential risks in bond portfolios as market conditions change in an effort to protect investment returns.