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All About Money

Investing in Bonds

Generally, "savers" and "investors" have different objectives for their money. "Savers" plan to use their money in the next 3–5 years, while "investors" won't need their money for five years or longer. Many "savers" want liquidity or quick access to their money without penalty. Bonds provide a desirable saving or investment vehicle for many reasons. Bonds tend to be safer than stocks because if you hold bonds until the maturity date, you don't risk the principal. Plus, bonds can provide a regular, steady source of income (typically, interest payments are received every 6 months). For the long term, investors need to be willing to "tie up" money when investing in bonds. However, bonds tend to have a lower return than stocks over the long term.

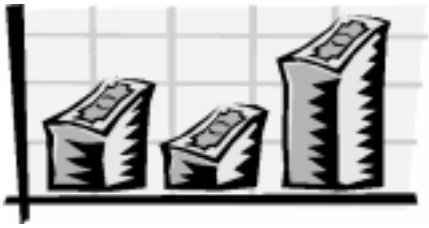
Owner vs. Loaner

Investment securities usually involve two types of securities—those where the investor is an owner or those where the investor is a loaner. Owner securities include stocks, real estate, equity unit investment trusts, equity mutual funds, collectibles, business ownership, and commodities.

Loaner assets are certificates of deposit, U.S. Treasury Securities, Municipal Bonds, Corporate Bonds, Convertible Bonds, Zero-Coupon Bonds, Bond Unit Investment Trusts, Bond Mutual Funds, Mortgage-Backed Securities, Collateralized Mortgage Obligations, Fixed Annuities, Preferred Stock, and Guaranteed Investment Contracts.[1]

What is a Bond?

A bond represents a loan obligation of the bond issuer (government, corporation, or individual) to the bondholder or investor. In essence, the investor loans funds to the bond issuer in exchange for interest payments for a set period of time. At the end of this time the borrower (bond issuer) pays the investor (bond holder/loaner) back the money loaned. A certificate of deposit is an example of a bond. A consumer goes to the bank and gives the bank money. In turn, the bank pays the consumer interest for the use of that money for a specified period. Then, the bank uses that money to invest in other projects, such as, small businesses or home mortgages.



Bond Terminology

Face value or par value is the value of the bond (amount of principal) printed on the certificate and received at maturity. If interest rates change and you need to sell Bond A before maturity, the value you receive may change. If interest rates increase, Bond A may sell at a discount or less than the face value. In this case, investors can buy Bond B paying higher rates so they are not as interested in this Bond A. If interest rates decrease, Bond A may sell at a premium because other investors would be willing to pay more for the higher interest rate on Bond A. See the example on page 5 of this fact sheet.

Coupon Rate (also known as coupon, coupon yield, stated interest rate) is the interest rate

[1] *Investing for Your Future*, A Cooperative Extension System Basic Investing Home Study Course, February 2000, Rutgers Cooperative Extension.

printed on the bond certificate when the bond is issued. It usually is stated as an annual fixed rate typically paid every six months to the investor.

Maturity date is the day when the face amount of the bond must be repaid and the debt retired. The coupon rate remains the same until the maturity date. Bond maturities may run from a few months to 40 years.

A call feature allows the issuing agency to pay the investor the face amount for the bond and buy back the bond before maturity. This allows the issuer to then reissue the bond at lower interest rates. In the event a bond is called, investors may then need to reinvest their money at lower interest rates as well. This results in reinvestment rate risk.

Default is the failure of the issuer of the bond to make payment on the interest or money borrowed. Thus, the investor can lose money.

Tax-equivalent yield—If you are buying municipal bonds for the state in which you live, the interest may be free of federal, state, and local income taxes. (You still may have to pay capital gain taxes if you sell the bonds at a premium.) These income tax-exempt bonds are appropriate for investors with marginal tax rates of 28% or higher. There are charts that compare taxable and tax-free yields for different marginal tax rates. Refer to the following web site: http://www.bondmarkets.com for this type of chart.

Different Types of Bonds

The following bonds are listed in order of risk. Those listed first have the least risk.

U.S. Government Bonds

The United States Treasury sells bonds to finance the federal government. Because the U.S. government has never failed to pay its debt, these bonds are considered to be some of the safest you can buy. Savings bonds can be bought with small dollar amounts ($25) and new inflation-indexed bonds (I-bonds) help protect against inflation. Information about these bonds can be found on the following web site: http://www.savingsbonds.gov or call 1-800-722-2678. Consumers can also purchase some U.S. bonds through brokers and banks or directly through the Federal Reserve Banks. In Ohio, there is a Federal Reserve Bank in Cleveland.

Mortgage-Backed Securities

Government agencies also sell bonds. Listed in order of safety, Ginnie Mae, Freddie Macs, and Fannie Maes are federal government agency home mortgages, which are lower risk but not as low risk as U.S. Treasuries. These bonds have uncertain maturities because people pay back mortgages before the end of the mortgage. All have irregular monthly payments that may include both interest and principal.

Municipal Bonds

State and local governments and government-related agencies (schools, water, bridge, highway authorities) sell bonds to raise money for a variety of purposes. After U.S. Treasuries, municipal bonds are considered the safest. Depending on the reason for selling bonds, there are different types of municipal bonds. In order of safety, these bonds are: general obligation, revenue, equipment, debenture. Bonds for private purposes (sports stadiums, airports, hospitals, industrial parks) may not be income tax-exempt.

Savings bonds can be bought with small dollar amounts ($25) and new inflation-indexed bonds (I-bonds) help protect against inflation.

Corporate Bonds

Corporations sell bonds to raise money for major projects. Corporate bonds pay higher interest because corporations cannot tax to raise money. Corporate bonds have no income tax advantages, thus, usually have higher yields; whereas, U.S. Treasuries are not taxed by state and local government. Some municipal bonds are free from federal income tax and may not be taxed by state and local governments.

Specialty Bonds

Variable rate bonds, CMOs[2], convertible bonds, and zero-coupon bonds are some examples of specialty bonds. Zero-coupon bonds are bought at a discount. At maturity the face value of a zero-coupon bond is more than the issued purchased price. However, there are no interest payments made to the

[2] CMOs are collateralized mortgage obligations and will pay back interest and a portion of principle. These are sometimes included in retirement plan options.

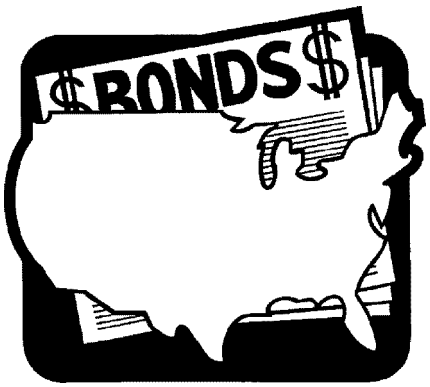
investor. The value of the bond increases each year. Even if the interest is not received by the investor, the interest is taxable as current income (unless zeros qualify as tax-free bonds).

How to Buy Bonds

When buying bonds, consider five factors: your investment objective, laddering of bond (spreading out maturity), diversification, bond yield, and bond risks. Bonds provide income through interest and some safety of the principal invested.

Investment Objective

1. Bonds should fit your investment objective which is income and safety of principal. If you are looking for long-term growth, bonds do not match your objective. However, if your objective is safety of principal and you want to earn current income from your money, bonds would match your objective. For example, a major objective of someone over 70 is to live off his/her investments and not lose money in case he/she may need money for health care. Although this individual may live 30 more years, a portion of his/her retirement money might be invested for growth in stocks but a majority should probably be invested for income in bonds that mature at different times so the principal would be available without loss.



Laddering

2. When buying several bonds, buy at different maturity levels. This is known as laddering. For example, buy a 2-year bond maturing in 2003, a 3-year bond maturing in 2004, 4-year bond maturing in 2005, and a 5-year bond maturing in 2006. When the 2-year bond matures in 2003, buy another bond maturing in 2007. That way you will have a bond maturing in each year and if you need money, you won't need to sell a bond at a reduced price (discount) before maturity.

Diversification

3. Bonds can provide diversification to an investor's holdings. Stocks and bonds tend to move in opposite directions. When the stock prices go up, bonds go down; when bonds go up, stocks go down. Over the long haul, this low correlation between stocks and bonds permits a portfolio to even out the highs and lows and can result in an overall higher return.

Bond Yield

4. Compare the yields of bonds to see the best return.

a. Yield to maturity is one way to compare bonds on the basis of time. This yield measures the bond's return when purchased (at par, discounted, premium) and held to maturity. The change in current income generated by the bond (interest) and as well as any change in its principal when it is held to maturity is "yield to maturity." However, this yield does not indicate which bonds are more likely to have price fluctuations and may not provide the best comparison of bonds with different maturities and different coupons. (See "duration" below.)

b. Yield to call expresses the return to the call date considering

any premium paid for the bond when called and the premium or discount paid for bonds when purchased. It may be higher or lower than the yield to maturity. As an investor, you are required to return bonds when called. A bond might be recalled if the bond issuer could refinance the debt at lower interest rates.

c. Duration will compare bonds with different coupons and different terms to maturity. It reflects the average time it takes to collect a bond's interest and principal repayment. This is a weighted average that encompasses the total amount of the bond's payments and their timing and then standardizes for the bond's price.[3] Higher duration indicates bonds more sensitive to interest rate changes. Bonds with shorter duration reduce risk associated with interest rates.

If Bond A has a duration of 5.4 years and Bond B has a duration of 6.2 years, the second bond has more risk. So, a conservative investor will want Bond A with the lower duration and a more aggressive investor, interested in capitalizing on the bond's price fluctuations, will desire Bond B with the higher duration. Durations can be used to compare bond mutual funds to see which funds will have more volatility if interest rates change.

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[3]Mayo, Herbert. *Investments: An Introduction.* The Dryden Press, 1993.

Bond Risks

5. The risks associated with bonds are tied to several factors. There are interest-rate risk, credit risk, callability risk, reinvestment rate risk, and inflation risk. The safest bonds are short-term (less than 5 years) Treasury Bills followed by other short-term government bonds. The riskiest bonds are long-term bonds (12 years–40 years), junk bonds, and high yield, or high return bonds.

a. The longer the maturity of bonds, the greater the interest (coupon) rate risk while shorter term bonds have less risk but lower returns.

—Short-term bonds mature in 5 years or less.

—Intermediate bonds mature between 5 and 12 years.

—Long-term bonds have maturity dates of more than 12 years.

Investors need to consider their time frame to choose bonds that fit their needs. If an 80-year-old buys a 30-year bond, she faces interest rate risk. Within 30 years interest rates could change dramatically. If the bond pays 6% interest, and interest rates climb to 12%, chances are you could lose money to inflation and could be making more money elsewhere over 30 years.

b. Risk is also associated with the coupon or interest rate on the bond. Bonds with lower interest rates will experience more fluctuations in bond prices than bonds with higher interest rates. If you have two bonds maturing in 30 years and Bond A pays 5% in interest and Bond B pays 15% in interest, Bond A's price will change more dramatically than Bond B's price. The principal value will have wider swings in its price if sold before the maturity date. Junk bonds and zero-coupon bonds will experience wider changes in prices. These changes in a bond's price will be reflected on broker statements, but are only realized if the bond is sold.

The riskiest bonds are long-term bonds (12 years–40 years), junk bonds, and high yield, or high return bonds.

c. Ratings on bonds also reflect assumed risk. Credit rating systems help consumers make more informed bond purchases from firms, individuals, and state and local governments. Higher rated bonds carry less risk while lower rated bonds (e.g., junk bonds or high yield/high return bonds) have more risk. During good economic times, junk bonds are safer than during poor economic conditions. Moody's Bond Ratings and Standard & Poor's Bond Ratings include investment grade or safer bonds as anything rated triple-B or above—(Aaa,AAA; Aa,AA; A,A; Bbb,BBB) while those ratings below the triple-B—(Ba,BB; B,B; Ccc,CCC; Cc,CC; C,C; D) carry higher risk of default. Junk bonds and high-yield securities are below the triple-B ratings and have higher risk.

d. Bonds can be called. Bonds may have call dates that protect the issuer from paying high interest rates if they can refinance and pay lower rates. If you hold a bond, it can be called back by the company issuing it. The company will pay you a predetermined amount to do this. You run the risk of having to reinvest your money at lower interest rates. This is a type of reinvestment rate risk.

Individual Bonds vs. Bond Mutual Funds

Investors have the choice of buying individual or bond mutual funds. There are advantages and disadvantages of each way of adding bonds to your portfolio.

Individual Bonds

Many investors purchase U.S. Savings Bonds. These are a very safe investment but sometimes they do not keep up with the cost of inflation. When buying municipal or corporate bonds, you need to purchase several different individual bonds to protect against business and financial risk. This requires a large sum of money for a beginning investor. If you hold bonds to maturity, you won't lose the principal of individual bonds. For the beginning investor, a bond mutual fund or a balance mutual fund (which holds both stock and bonds) is a good place to start.

Bond Mutual Funds

Risk in bond funds is determined by the credit ratings of the bonds held, the duration of the bonds held (or the average maturity), and the variability of interest rates. The longer the average maturity, the more risky the fund is or the higher the duration, then the riskier the fund. Advantages of buying bond mutual funds are that they:

—can reinvest dividends which can't be done with individual bonds,

—can invest small sums of money and make small, regular contributions,

—can withdraw portions of invested money if forced to sell bonds before maturity,

—can help investors speculate on a decline in interest rates, and

Bonds are a good way to diversify a portfolio and help to meet investors' income objectives.

—can achieve diversification for a small amount of money.

Bond funds provide flexibility in buying and selling for small investors. If you want all your capital back, then buy individual bonds. Fees are a factor in bond mutual funds, so carefully read the mutual fund prospectus to identify the fees charged. Bond mutual funds do not guarantee a return of the money invested.

Advantages and Disadvantages of Investing in Bonds[4]

Advantages of bonds are:

- Bonds pay higher interest rates than savings accounts.
- Bonds usually offer a relatively safe return of principal.
- Bonds often have less volatility (price fluctuations) than stocks, especially short-term bonds.
- Bonds offer regular income.
- Bonds are sold in small dollar amounts (U.S. Savings Bonds—$25, $50).
- Bonds need less careful attention in management than other alternative investments.
- Bond interest from municipal bonds can be exempt from federal income taxes and possibly from state and local income taxes.

Disadvantages of bonds are:

- Bonds offer no hedge against inflation because inflation causes interest rates to rise which then causes bond prices to fall.
- Bond prices can be quite volatile because market interest rates vary after a bond is issued.
- Bonds over the long term have lower returns than stocks.
- Bond prices may swing 20% or more if selling bonds before maturity. Speculators might see this as an opportunity but conservative investors will need to ignore price changes if planning to hold to maturity.
- Individual bonds do not compound their interest. However, this is possible with bond mutual funds.
- Taxes will be owed on capital gains/losses (selling before maturity) and interest unless the bonds are tax-exempt.
- Diversification is hard to achieve (unless investing in bond mutual funds) because at $1000 for each bond, many different types of bonds would be needed.

In conclusion, bonds are a good way to diversify a portfolio and help to meet investors' income objectives. See how much you understand by trying to answer the questions about the example on page 6.

Additional Resources

Investing for Your Future, A Cooperative Extension System Basic Investing Home Study Course, February 2000, Rutgers Cooperative Extension. Can be obtained from OSU Extension. Ask for Bulletin 884. This bulletin is also available online at:
http://www.investing.rutgers.edu

Federal Reserve Bank, Cleveland, OH or call 1-800-943-6864
http://www.savingsbonds.gov

Garman & Forgue, *Personal Finance.* 6th Edition, Houghton Mifflin Company, 2000.

Quinn, Jane Bryant. *Making the Most of Your Money*. Simon & Schuster, 1997.

The Bond Market Association, 40 Broad Street, New York, NY 10004-2373.
http://www.bondmarkets.com
http://www.investingbonds.com

Other OSU Extension fact sheets in this series:

MM-01 Start with Mutual Funds

MM-02 Financial News You Can Use

MM-03 IRA—Individual Retirement Account

MM-04 Retirement Planning

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Visit Ohio State University Extension's WWW site "Ohioline" at:
http://ohioline.ag.ohio-state.edu

[4]Quinn, Jane Bryant. *Making the Most of Your Money.* Simon & Schuster, 1997, Chapter 25, How to Use Bonds.

See how much you understand. Choose which bond to buy. It is now the year 2001.

Description	Price	Callable	YTM or YTC	Rating
Bond A 7.75% due 04/15/24 Semiannual Interest Payments MBIA Insured (Min. $5000 principal)	$997.50	04/15/04 @103.751	7.773% YTM	AAA/Aaa
Bond B 8.625% Due 08/01/20 Semiannual Interest Payments (Min. $5000 principal)	$1016.25	08/01/05 @100.00	8.116% YTC	A/A

Comparing the above two bonds:

1. How much would you receive in interest payments for the year for Bond A and Bond B?
2. What are the maturity dates of Bond A and Bond B?
3. Which bonds are insured—Bond A and/or Bond B?
4. Which bond is selling at a premium and which bond is selling at a discount?
5. Can these bonds be called and if so, when? When they are called, do you get the face value?
6. If the coupon rate on Bond A is 7.75%, why is the yield to maturity (YTM) 7.773%?
7. If the coupon rate on Bond B is 8.625%, and it sold for a premium, why is the yield to call (YTC) 8.116%?
8. Which bond would you buy?

Answers to questions:

1. Bond A will pay $77.50 yearly for every $1000 purchased. With a minimum investment of $5000 you would receive $387.50. If you purchased bonds worth $10,000 you would receive $775 divided into two semiannual payments. For Bond B the interest would be $86.25 for every $1000 owned. For the minimum of $5000, an investor would receive $431.25 a year.
2. Bond A matures on April 15, 2024, while Bond B matures on August 1, 2020. Both are long-term bonds which are considered more risky than short-term bonds (matures in 5 years or less).
3. Bond A indicates it is insured and Bond B does not indicate any insurance. This insurance means if the company issuing Bond A goes bankrupt, you will receive your principal back from the insurer.
4. Bond B is selling at a premium of $16.25 over a face value of $1000. Bond A is selling at a discount of $2.50 under a face value of $1000. The reason for this is the interest rate or coupons on Bonds A and B. B pays a higher interest rate while A is paying a rate lower than market rates. These are not newly issued bonds which sell at the face value.
5. Yes, both bonds can be called. Bond B can be called in 2005 at face value or $1000 for each $1000 invested. Bond A can be called in 2004 at more than face value $1037.51 for each $1000 owned.
6. Yield to Maturity (YTM) on Bond A is 7.773% or more than the 7.75% interest paid. The reason for this is you bought the bond at a discount so you paid less than $1000 and the $2.50 increase in value of the bond is added to the interest you have received since that time. That discount increases the yield you will receive.
7. When this bond is called you will receive the face value of $1000 yet you paid a premium of $1016.25 so you have lost $16.25. That loss is added to the interest paid 8.625% and it lowers your return to 8.116%.
8. It depends on how much risk you are willing to assume. Bond A is the safer bond, is insured, is highly rated, but has a lower interest rate. It is a long-term bond and it is callable within a few years. Bond B has a lower credit rating, is not insured, but has a higher interest payment. If interest rates rise, the face value of this bond will drop. If interest rates drop, this bond will sell at an even higher premium. Conservative investors will probably like Bond A, while aggressive investors thinking that rates will drop within the next 4 years might speculate on Bond B hoping to sell at an even higher premium.