Arcataur Capital Management LLC
826 N. Plankinton,
Suite 300
Milwaukee, WI 53203
414.225.8200

Arcataur Capital Management LLC
A Registered Investment Advisor

High Quality Investment Management
For Individuals and Institutions

Bond Basics

This piece is intended to provide a basic overview of bonds for investors who are unfamiliar with direct ownership of bonds or fixed income instruments. The goal is to provide a working knowledge of owning bonds and how changes in financial conditions impact the market value of fixed income securities.

***What is the difference between a stock and a bond*?** A stock represents an actual ownership interest in a company. A bond on the other hand, is a loan (or contractual obligation) to a company or government (such as U.S. Treasury bonds). The issuer promises to repay the bond at maturity and make periodic interest payments as compensation for the loan. Bondholders have a priority claim over equity holders on the assets of the company in the event of a liquidation or bankruptcy.

Instead of trading on a central exchange (like the NYSE for stocks) most bonds trade through a network of "dealers" who hold inventories of bonds. When trading most type of bonds, your bond broker or dealer does not go to an exchange, but they go directly to a dealer who specializes in trading the type of bond you are trying to buy.

This means that there is much less standardization and price transparency in the bond market than there is in the stock market. Because of this, the price that one investor pays for a bond may be significantly different than the price another investor pays when doing a trade in the same type of bond at the same time.

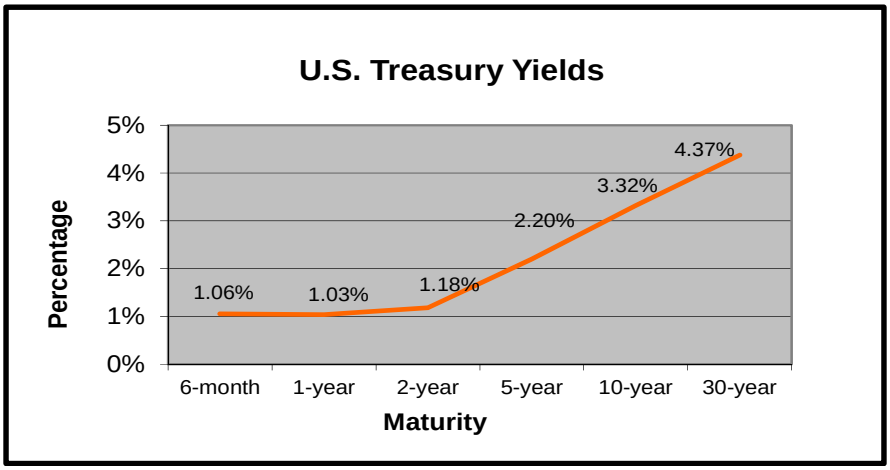
The global bond market is nearly twice the size of the global stock market. In the U.S. bonds are typically identified by their "CUSIP", while stocks trade by their ticker symbol, even though a CUSIP is issued for stocks. The Committee on Uniform Securities Identification Procedures supplies the unique nine-character identification, called a CUSIP number, for each class of security approved for trading in the U.S. to facilitate clearing and settlement. These numbers are used when any buy and sell orders are recorded.

What are the most common terms associated with bonds?

- **Par or Face Value -** This reflects the amount at which the bond was originally issued. Bonds are typically denominated in units of $1,000.
- **Coupon Rate -** This is the annual interest rate the bond issuer pays to the holder of the bond. Typically, bonds pay interest twice a year.
- **Market Value -** This is the amount that a purchaser would be willing to pay for the bond after it was issued. This will differ from the par or face value reflecting changes in interest rates or credit risk. A bond can be purchased for more than par (premium) or less than par (discount).
- **Accrued Interest** - When a bond is purchased between interest payments, the interest that accrued while the seller held the bond is included in the purchase price. The purchaser recovers the accrued interest when the next interest payment is made.
- **Yield -** This is the return an investor will receive after purchasing a bond, collecting interest payments, and selling the bond or having it redeemed. This will differ from the coupon rate if the bond was purchased at a premium or discount. Yield calculations assume that the interest payments are reinvested at the same yield. Yield to Maturity measures the effective yield if held until maturity, while yield to call measures the effective yield if the issuer can call or pay-back principal prior to the maturity date.

Bond Basics

- **Duration -** is a term used by investment professionals when referring to individual bonds or a portfolio of bonds. It provides a way to measure the sensitivity of a bond price to changes in interest rates. Duration is measured in years and typically shorter than average maturity for a bond portfolio, as it accounts for the receipt of interest payments throughout the life of the bond.
- **Yield Curve -** The yield curve reflects the current level of interest rates based on U.S. Treasury debt for various maturities. Short-term (1 month) to long-term (30 year) rates are graphed to create the yield curve.



What are the most common type of bonds?

- ***U.S. Treasury notes*** (original maturity 2-10 years) and ***bonds*** (original maturity greater than 10 years) are issued by the U.S. Department of the Treasury and are backed by the full faith and credit of the U.S. government. As such, the instruments are viewed as having no credit risk.
- ***U.S. Agency securities*** are issued by a variety of entities created by Congress to reduce the cost of borrowing for certain sectors of the economy including homeowners, farmers and students. These entities are referred to as government-sponsored entities or GSEs. The most well-known of the GSEs include the Federal Home Loan Mortgage Corporation (Freddie Mac), the Federal National Mortgage Association (Fannie Mae), the Federal Farm Credit Corp (FFCB) and Federal Home Loan Bank (FHLB). Bonds issued by these entities are not backed by the full faith and credit of the U.S. Consequently, purchasers of these securities are exposed to some level of credit risk. However, the credit risk is considered minimal and these bonds are currently rated within a range of Aaa to AA+. Fannie and Freddie were put under Conservatorship by the U.S. Treasury Department in September 2008 and remain there, which implies continued sponsorship by the U.S. government until suitable legislation can reform those entities.
- **Corporate bonds** are issued by public corporations to fund operations. These bonds have a higher level of credit risk than the aforementioned U.S. Treasuries and U.S. Agencies. The level of credit risk is a function of the financial strength of the issuer. Credit quality can range from AAA (the highest) to below investment-grade or junk bonds.
- **Mortgage bonds and other asset-backed bonds** represent pooled assets of various maturities and quality. **Arcataur does not invest in these instruments.**
- **Convertible bonds and preferred stock** hybrid type investments that pay regular coupons or dividends; however, typically they fall below traditional bonds on the hierarchy of the issuer's capital structure, but still above common stock. **Arcataur does utilize preferred stock exposure to provide diversification and yield enhancement where appropriate.**

Bond Basics

What do Bond Ratings represent?

Bonds are rated by several independent companies. The intent is to assign a rating that reflects the credit risk of a bond. The most prominent of the rating agencies are Moody's and Standard & Poors. These agencies use similar scales as follows:

Moody's	*S&P*	*Risk*	*Types of Bonds*
Aaa	AAA	Lowest	U.S. Treasuries, U.S. Agencies
Aa	AA		& Corporate Bonds
A	A		Corporate Bonds
Baa	BBB		(Investment Grade)
Ba	BB		Below Investment Grade
B	B		Corporate Bonds
Caa	CCC	Highest	(High Yield aka Junk)

Each rating category includes further refinement through the use of + or - for S&P or 1,2,3 for Moody's

What are the fundamental mechanics of a bond?

For example, the cash flow of a typical U.S. Treasury bond is as follows:

Amount $1,000

Maturity 6/15/X4

Coupon 5.0%

Interest paid semi-annually on 12/15 and 6/15.

12/15/20X1	6/15/20X2	12/15/20X2	6/15/20X3	12/15/20X3	6/15/20X4
($1,000)	$25	$25	$25	$25	$1,025

(Bond Purchased) (Bond Redeemed)

Bond Basics

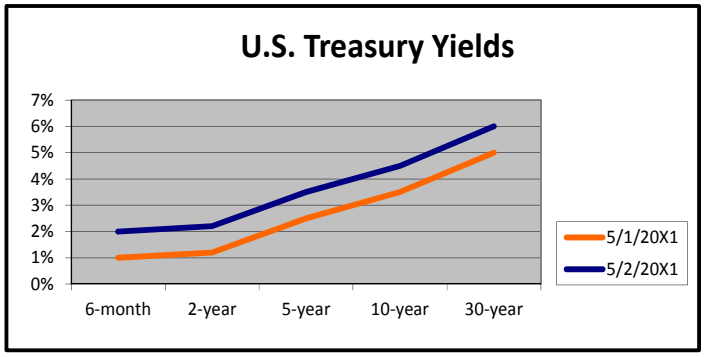
What are the risks of owning bonds? Bond risk can be segregated into several categories:

I. *Interest Rate Risk* is the risk that the value of a bond will decline due to an increase in interest rates. Bond prices move in the opposite direction of interest rates; as interest rates rise, bond prices fall, as rates decline bond prices increase.

Why?

Let's say the U.S. Treasury issues a $1,000, 5 year bond today. Based on the yield curve, the U.S. Treasury would have to pay a coupon rate of 2.7% for that bond. An investor would purchase that bond for $1,000 and receive an annual yield of around 2.7%. The actual yield could vary slightly based on the investor's ability to reinvest the coupon payments.

Suppose the next day, rates increased by 1.0% (not very likely but makes the example easier to understand) as follows:



	Yesterday's Bond	Today's Bond
Coupon	2.70%	3.70%
Maturity	5/1/20X1	5/2/20X1
Par	$1,000	$1,000

The U.S. Treasury needs to issue another $1,000 bond, and this time the bond will need to have a coupon of 3.7% to reflect the higher rates. Now as an investor you have a choice to purchase *yesterday's* U.S. Treasury bond or *today's* bond. Clearly today's bond is more attractive as it pays 3.7% versus 2.7% for yesterday's bond. The only way you would buy yesterday's bond is if you could get a return of 3.7%. To do this you would buy yesterday's bond at a discount. Instead of paying $1,000 you would pay $956, so that the coupon payments plus the discount (you still receive $1,000 at maturity) equal a return of 3.7%. Because you would not pay $1,000 for yesterday's bond, its market value has fallen from $1,000 to $956. Whoever sold you the bond would have a real loss of $44. Assuming that instead of selling you the bond, the holder decides to keep the bond. As the bond nears maturity, the price will rise to $1,000 (that's how much the holder is going to receive) and the original purchaser will not record a loss. They will have received a yield of 2.7% which may or may not be considered attractive depending on interest rate movements over the intervening 5 years.

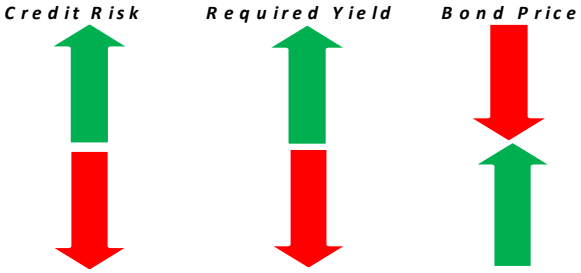
Using the same example, if interest rates fell 1% the next day (again not likely), yesterday's bond would be more valuable as it pays 2.7% versus today's bond of 1.7%. In this case the value of the bond would rise to $1,044. If you held the bond to maturity, the value would revert to $1,000 as that is the amount the holder will receive.

Bond Basics

In Summary:

- The value of bonds moves in the opposite direction as interest rates.
- An investor can experience gains and losses on a bond resulting from changes in interest rates and if they were purchased at a premium or discount to par value.
- The gains and losses are only recognized if the bond is sold before maturity.
- If held to maturity and bought at par, there will be no gain or loss. but the effective yield may or may not compare favorably to the market. A bond bought at premium will create a loss at maturity, while a bond bought at a discount will create a gain at maturity.

II. ***Credit Risk*** is the risk that the value of a bond declines due to deterioration in the credit quality of the issuer. As mentioned earlier, U.S. Treasury bonds are viewed as having no credit risk. U.S. Agencies have some credit risk, but it is considered fairly limited. Credit risk is primarily associated with bonds issued by public corporations. Corporate bonds are initially issued at a rate that includes a premium or spread over a U.S. Treasury rate to compensate for the additional risk. If the credit quality of the company deteriorates, the market will demand a wider spread over U.S. Treasuries and, thus, a higher yield to compensate for the increased risk. Similar to an actual rise in interest rates, a wider spread results in a higher yield and a lower price for the bond.



Let's use an example to demonstrate. Suppose you purchased a 5 year $1,000 bond issued by Disney on 10/3/X2. On that day, Disney's credit rating was A-. Investors required a spread of 2.0% over a comparable U.S. Treasury of 1.8% for an all in yield of 3.8%. Suppose the next day the rating was lowered to BBB+. The lowered rating reflects increased credit risk. An investor would require a higher spread; say 2.5% over a U.S. Treasury to compensate for the increased risk. Since your bond only pays 3.8% versus a market rate of 4.3% (2.5% plus 1.8%). You would have to lower the price of your bond from $1,000 to $980 to give the purchaser the required market yield. If you held the bond to maturity, the price would return to $1,000.

In the event the credit quality of the company issuing the bond improves, the market would demand a smaller risk premium and lower yield. The existing bond would increase in price but revert to the original face at maturity. In the case of extreme and rapid credit deterioration, the value of bonds can fall significantly. If a company files bankruptcy, bond holders have priority over stockholders, but often the amount recovered is less than the face value of the bonds.

In Summary:

- The value of bonds moves with changes in the risk premium or spread.
- Wider spreads result in lower bond prices; tighter spreads result in higher prices.
- An investor can experience gains and losses on a bond resulting from changes in credit spreads, but if held to maturity and bought at par no gain or loss would be realized.

Bond Basics

III. ***Liquidity Risk*** is the risk that bondholder might have to accept a lower price to quickly convert a bond to cash. Normally U.S. Treasuries and U.S. Agencies are more liquid and can be sold or easily converted to cash. Since the credit crisis in 2008, bond market liquidity at times can be less than normal. High quality corporate bonds from large issuers are generally liquid, but less so than U.S. Treasury bonds. Lower credit quality instruments, including high yield bonds, can be the least liquid.

Conclusion:

The value of bonds moves with changes in interest rates and changes in credit spreads. These two drivers are independent of each other. An investor can experience market value appreciation or declines on a bond resulting from these changes. The gains and losses are only recognized if the bond is sold before maturity. If held to maturity, there will be no gain or loss for bonds purchased at par, while bonds purchased at a premium or discount will result in a loss or gain at maturity. The effective yield earned over the holding period of any bond may or may not compare favorably to the prevailing market conditions.

Arcataur Capital Management LLC

A Registered Investment Advisor

826 N. Plankinton Avenue, Suite 300, Milwaukee, Wisconsin 53203

414.225.8200