Madison INVESTMENTS

BOND CONCEPTS

Coupon Rate, Current Yield, and Yield to Maturity

In fixed income investing, there are several different ways to measure an individual bond's ability to produce income. Three of the most often cited measures are a bond's **coupon rate**, **current yield**, and **yield to maturity**. Each measure has its place, but which matters the most?

Coupon Rate

Let's start with the coupon rate. The coupon rate determines how much interest will be paid annually. The annual interest to be paid is calculated by multiplying the par value of the bond by its coupon rate. For instance, a $100,000 bond with a 7.5% coupon will pay the holder $7,500 per year, while a bond with a 2.25% coupon will pay just $2,250. If this is the only measure you look at, it would seem the 7.5% coupon is the better bond.

Coupon rate accounts for:		
✓ Coupon Payments	✗ Price paid for the bond	✗ Amortization/Accretion of Premium/Discount

Current Yield

Consider, though, that an investor would be willing to pay more for a larger income stream. All else equal, the higher the coupon, the higher the price of the bond. Current yield is a measure that takes this into account. The current yield of a bond is calculated by dividing the coupon of a bond by its price. If a 7.5% coupon bond sells at $110, its current yield would be 6.82%. If a 2.25% coupon bond sells for $95, its current yield would be 2.37%. Considering only current yield, the bond with the higher coupon is still the better choice.

At the end of the day, assuming risk factors are equal, the comparison that matters most is how much an investment earns. What the coupon rate and current yield fail to account for is the actual cash flow over the life of the bond. This includes the amount owed to the bondholder at maturity, known as par value. Using the same two bonds, let's factor in cash flow to see which one really is best.

Current yield accounts for:		
✓ Coupon Payments	✓ Price paid for the bond	✗ Amortization/Accretion of Premium/Discount

	Bond A	Bond B
Maturity	3 years	3 years
Coupon	7.50%	2.25%
Price	$110	$95
Par value	$100	$100
Current yield	6.82%	2.37%
Investment amount	$100,000	$100,000
Par value paid at maturity	$90,000	$105,000
Capital appreciation/loss	($10,000)	$5,000

By summing the interest earned and the par value returned, the investor will be able to see which $100,000 investment yielded a greater return. Bond A returns $20,250 in coupon payments + $90,000 in par value for a total of $110,250. Bond B returns $7,087.50 in coupon payments + $105,000 for a total of $112,087.50. When considering the actual cash flow over the life of the two bonds, Bond B provides the superior return. How can this be?

The initial investment in both Bond A and Bond B is equal, yet the investor will only be returned $90,000 par value of Bond A at maturity, while $105,000 of Bond B. During the time that they are outstanding, Bond A will pay $3,375 every May 15 and November 15 while Bond B will pay just $1,181.25. Upon maturity, the investor will receive the par value of the bond purchased (either $90,000 or $105,000). The interest cashflows are detailed in the table below.

	Bond A	Bond B
5/15/2023	$3,375	$1,118.25
11/15/2023	$3,375	$1,118.25
5/15/2024	$3,375	$1,118.25
11/15/2024	$3,375	$1,118.25
5/15/2025	$3,375	$1,118.25
11/15/2025	$3,375	$1,118.25
Total Interest	$20,250	$7,087.50
Par value at maturity	$90,000	$105,000
Total cash flow	$110,250	$112,087.50

Yield to Maturity

The answer lies in the final measure, a bond's yield to maturity (YTM). In bond speak, yield to maturity is defined as the rate at which a bond's cash flows discounted back to present day will equal the bond's price. In the example above, Bond A has a YTM of 4.03%, while Bond B has a YTM of 4.15%.

Yield to maturity accounts for:			
✓ Coupon Payments	✓ Price paid for the bond	✓ Amortization/Accretion of Premium/Discount	✗ Reinvestment risk

Despite the simplicity of coupon rate and even current yield, we believe yield to maturity is the best measure to compare like bonds. However, one important factor that investors should not overlook is reinvestment risk. Yield to maturity assumes the bond is held until maturity and that an investor can reinvest at the same yield. In practice, interest rates move on a daily basis and it is far from a guarantee that an investor can reinvest at the same yield to maturity.

Horizon Analysis

Investors should consider reinvestment and other risks when buying a bond or building a portfolio. Horizon analysis is the process of evaluating risks that may surface prior to a bond's maturity. Typically, an investment manager will run a multitude of scenarios on portfolios or with potential trades to assess the impact of various risks. The manager can then make more informed decisions on whether to buy, hold, or sell a bond, thus controlling the various risk factors over time.

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Par value: The face value of a bond and the amount owed to the bondholder at maturity.

The examples provided in this material are mathematical illustrations only and do not represent any Madison strategy or investment. The examples assume the bond are held to maturity and do not default.

In addition to the ongoing market risk applicable to portfolio securities, bonds are subject to interest rate risk, credit risk and inflation risk. When interest rates rise, bond prices fall; generally, the longer a bond's maturity, the more sensitive it is to this risk. Credit risk is the possibility that the issuer of a security will be unable to make interest payments and repay the principal on its debt. Bonds may also be subject to call risk, which allows the issuer to retain the right to redeem the debt, fully or partially, before the scheduled maturity date. Proceeds from sales prior to maturity may be more or less than originally invested due to changes in market conditions or changes in the credit quality of the issuer.