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Bonds - The Price of a Bond Part 2

Welcome to part 2 of our third Bonds course. In part 1 of this course we looked at price as a percentage and clean and dirty process. We'll explore:

- Why Bond prices change?
- Current interest rate or 'yield to maturity'
- Changes to interest rates
- Liquidity premium
- Changes to the credit rating of the bond

If you haven't done part 1 of this module, we recommend it – otherwise let's get started and look bond prices.

Introduction

Now we need to understand the market influences that can change the price of a bond. This second tutorial on bond prices will explore the primary market factors that can cause prices to change. The objective of the tutorial is to give you the ability to assess why a particular bond price has changed and what might cause it to change in the future. Changes in bond prices will always have an immediate effect on your bond trading profits and losses.

Why do Bond prices change?

As we've seen, there are a number of reasons why bond prices change. Let us identify the key factors that will have an impact on the price of a bond and then explain each one in more detail.

- Changes to interest rates.

  The bond is an interest rate product and any changes to current interest rates for the maturity of a bond will have an impact on its price.

- The liquidity of the bond.

  Just like any other traded asset if a bond is in short supply and many traders want to buy it its price will go up because of the demand.

- Changes to the credit spread of the bond.

  The credit spread is part of the interest rate that affects a bond's price. Changes in the market's perception of an issuer's credit rating will affect this spread which in turn will change the price of the bond.

And in addition to these factors, there is of course the general supply and demand for a bond. It is a traded market after all.

Let us look at these important factors one by one.

Bond Prices – Changes in the Yield to Maturity

Changes in the yield to maturity of bonds are why bond prices change. Why is this? To answer this question we need to know how changes to the yield to maturity interest rate affect a bond's price.

Let us look at an example to illustrate this connection between a bond's price and its yield to maturity: Alpha Inc – an AA rated credit risk - issue a 10-year bond with a coupon of 4.00%.

At the time of the issue, the yield to maturity - or return - required by bond investors for a 10 year bond issued by a company with an AA rating was also 4.00%.

The bond's coupon and the interest rate required by investors in the market place was the same. So at the time of issue an investor buying this USD 100,000 face value bond would pay USD 100,000 because the bond price would be trading at *100.00% of par*.

Three months after issue, market events have resulted in the yield to maturity for this class of bond, (a double A rated 10 year bond) rising to 4.25%. We will look at the reasons why the interest rates could have changed in later tutorials. For the this example we accept that the yield to maturity has gone up.

So what happens?

Alpha Inc - A Bond example continued

The holder of the 'Alpha Inc' bond owns a security that pays an interest rate (the coupon) of 4.00% in a market that expects a return of 4.25% for the same risk. No one will buy a bond, at a price of 100.00% of the par value, as an investment that only pays 4.00% when everyone in the market expects and can obtain a return of 4.25% for the same risk.

The only way that the Alpha bond can become a competitively traded bond is if its price comes down to compensate for the 0.25% difference. In this case its price would have to fall to about 98.11% of par to achieve this equilibrium. At this price of 98.11%, a 10 year bond with a credit rating of AA and a coupon of 4.00% is trading at a yield to maturity of 4.25%.

The important observation that a bond investor can make here is that as interest rates - the yield to maturity - went up; the price of the bond fell. Bond prices move in the opposite direction to interest rates, they have what is called an inverse relationship to interest rate movements.

What happens if yield to maturity interest rates rise?

Using the 'Alpha Inc' bond again let us assume that interest rates – the yield to maturity - for this class of bond fall to 3.50%. What happens to the bond price now?

The Alpha bond pays a coupon of 4.00% in a market that only expects to receive 3.50% for an AA, 10 year investment risk. This bond is a valuable asset on that basis. An investor holding this bond will be aware of its value and will want to sell it for more than its face value. Buyers of the bond will understand this as well and will expect this value to be reflected in the price. The price of the bond will, therefore, rise to more than 100%. In this instance it will rise to about 103.88%.

At this price of 103.88%, a 10 year bond with a credit rating of AA and a coupon of 4.00% is trading at a yield to maturity of 3.50%.

We know from the previous page that bond prices and interest rates have an inverse relationship. In this case interest rates fell and the price of the bond went up.

A Quick Review

So, let's take a moment to summarize what we have discovered about the relationship between bond prices and interest rates:

- If the YTM of the bond is the same as the coupon then the bond will be trading at its par value; that is 100%.
- If the YTM of the bond is lower than the coupon then the bond will be trading at a premium to its par value; the price will be above 100%.
- If the YTM of the bond is higher than the coupon then the bond will be trading at a discount to its par value: the price will be below 100%.

Actually, a bond can be traded on its price or it's YTM. The two factors are interchangeable and represent the same value. Many bond trading screens will show yields rather than prices because it is easier to compare the yield to maturities of different bonds rather than to compare prices.

How does a bond's liquidity affect its price?

The liquidity of a bond refers to its *'availability'* for trading. How easy it is to trade it in other words. Government bonds are generally very liquid and investors are able to find such bonds quite easily.

During the period after first issue, maybe up to one year, individual corporate bonds also tend to be readily available for trading purposes. As time goes by, institutional investors tend to buy the most interesting bonds and these large investors are often more interested in keeping the bonds until they mature - this results in the bonds becoming scarce. Their liquidity begins to decrease as time goes by. So how does this affect the bond's price?

If anything is scarce in a traded market its price goes up. Bonds are no different. If lots of investors are interested in buying a particular bond its price rises above what would normally be expected for a bond of its credit rating and maturity. This difference between the expected price of the bond and the new increased price is known as its *Liquidity Premium*.

The liquidity premium is elevated at times of market stress and can affect both buyers and sellers of bonds. For example, a seller who needs to sell a bond which is subject to market illiquidity may have to accept a low price or perhaps may not be able to sell the bond at all. The liquidity premium effect can, therefore, impact you as a buyer or a seller depending on whether you need to buy or sell a particular bond.

The previous page of this topic explained the inverse relationship between bond prices and yields. If a bond is subject to a liquidity premium its price will rise and its yield to maturity will fall.

As an investor, if you identify a bond in which you would like to invest, and the price looks high, it could be due to the bond having a liquidity premium.

Credit spread and yield to maturity

How do changes in a bond's 'credit spread' affect its yield to maturity?

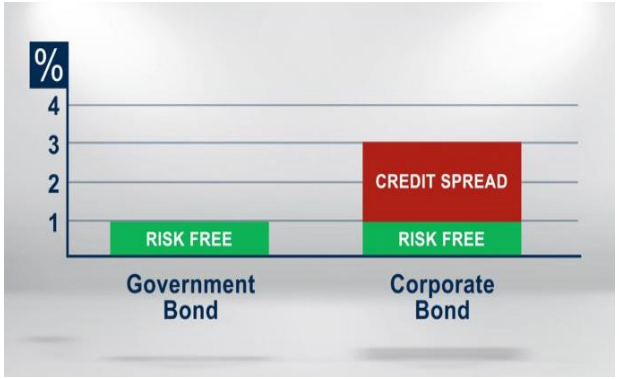
The yield to maturity on a bond is made up of two things. A risk-free interest rate and a credit spread. Traditionally it has been assumed that because governments can borrow their own currency at the risk free rate they cannot become bankrupt.

Today that's not quite true anymore, we only have to consider Greece's situation in the Eurozone to see that we cannot apply this logic to every government. In the case of Greece, their government has to borrow Euros which is not exclusively their own currency.

Nevertheless the approach of the market is to assume that there is a risk free rate at which most governments can borrow and because companies can default they must, therefore, pay a credit spread premium over the risk free rate.

The size of the credit spread depends on a company's ability to service the bond issue; the larger the credit spread the more probable it is that a company could default on its debt. Together, rating agencies and the bond market will dictate what the credit spread should be for particular corporate debt issued for a specific maturity.

This means that if the credit spread increases on a particular corporate bond its price will fall because its overall, yield to maturity, interest rate has gone up. Conversely if the credit spread reduces on a corporate bond and the issuer is perceived to be a better credit risk, its yield to maturity will fall and its bond prices will rise.



Summary

So that's the end of the course. Let's do a quick summary of what we've covered:

- ✓ If the current market interest rate (YTM) for a particular class and maturity of bond is below the coupon rate then the bond is more valuable because it pays the higher interest rate and will, therefore, trade at a premium to par to cancel the difference between the YTM and the coupon.

- ✓ If the current market interest rate (YTM) for a particular class and maturity of bond is above the coupon rate then the bond is less valuable because it pays the lower interest rate and will, therefore, trade at a discount to par to cancel the difference between the YTM and the coupon.

- ✓ The trading liquidity of a bond can also affect its yield to maturity and, therefore, its price. The price of a bond will rise if it is in demand by investors. This will cause its yield to maturity to fall.

- ✓ Government bonds typically trade at the risk free rate for a currency. However, be aware that there are exceptions to this rule. Corporate bonds trade at the risk free rate plus a credit spread. Increases in the credit spread will cause a bond price to fall. Reductions in the credit spread will cause a bond price to rise.