

4.7: Zero Coupon Bonds

A Call Provision is a provision included in the bond indenture that gives the company that issued the bond the right, at their discretion, to purchase (call) the bond back from investors before it matures for a pre-set price. Usually the call provision does not start immediately, but becomes effective after a 5-10 year time period. Also, the pre-set price is typically (but not always) a small premium to the \$1000 maturity value.

To calculate the Yield-to-Call (YTC) we approach the problem in a similar manner as the YTM, except for two differences. First, the number of years until the first call date is used as opposed to the number of years until maturity. Second, the call price (which usually includes a small premium over par value) is used instead of the maturity value.

For example, consider a bond with 20 years to maturity that has a current price of \$925, a coupon rate of 5.5%, and is callable in 5 years at \$1050. Find the YTC for this bond. To do this, follow the same procedure outlined above for calculating the YTM, but now the FV is \$1050 instead of \$1000 and the number of years is 5 (the 20 years to maturity is irrelevant in calculating the yield-to-call).

Financial Calculator:

```
2 P/Y
10 N
-925 PV
27.50 PMT
1050 FV
Compute I/YR ⇒ 8.19%
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As with the YTM calculation, the PMT and FV should be the same sign and the opposite of the PV sign when solving for the YTC.

At this point, there may be some confusion as to why there are potentially three different “rates” associated with a bond. There is the coupon rate, the yield-to-maturity, and (if the bond has a call provision) the yield-to-call. From an investor’s perspective, how do we know which of these rates to focus on? First, remember the discussion from earlier in the chapter regarding the coupon rate and the discount rate. We said that the discount rate (yield-to-maturity or market rate of interest) was the correct “rate”. The reason for this is that the coupon rate does not reflect a rate of return, but tells you how much you will receive for the annuity stream portion of the bond. A 6% coupon bond may offer an investor a greater rate of return than an 8% coupon bond if he can buy the 6% coupon bond cheap enough relative to the price of the 8% coupon bond. His return depends not only on what cash flows he receives, but on how much he paid for them. The YTM incorporates not only the coupon payments, but also the price he paid to receive them and how long he anticipates receiving them. It therefore provides more information and is more meaningful.

What about the YTM vs. the YTC? Here, we need to remember that the investor doesn’t decide whether or not to call the bond, the issuer does. Assume that you are borrowing money and are paying an interest rate (YTM) of 8.5%. Alternatively, if you pay the loan off early (even if you need to borrow money to do so) and it lowers your effective rate of interest to 6%, would you want to do so? Certainly. This is why people refinance their mortgage when interest rates decline. Since the issuer makes the decision on whether or not to call the bond, the issuer will only do so if it is to the issuer’s advantage. Note that people don’t rush out to refinance their mortgages when interest rates are rising. Therefore, if the YTC is less than the YTM, the bond is more likely to be called (to save the issuer interest expense). This means that the investor is more likely to receive the YTC. On the other hand, if the YTC is higher than the YTM, the bond is not likely to be called. This means that the investor is more likely to receive the YTM. In other words, the lower of the two rates (YTC or YTM) is the one that the investor is more likely to receive and therefore is the more meaningful rate of return.

Video [Yield-to-Call](#)



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