10.5: Estimating the After-Tax Cost of Debt

The after-tax cost of debt is found through the following equation

$$k_i = YTM(1-T)$$

Where

k_i represents the after-tax cost of debt
YTM represents the Yield-to-Maturity on the debt
T represents the marginal tax rate on interest

It is critical to note that we must use the after-tax cost of debt as opposed to the before-tax cost of debt. Interest appears on the income statement before taxes. This means that each dollar paid in interest lowers our tax bill. The Federal government is paying part of our interest bill for us through this reduction in tax expense. Unfortunately, dividends are paid after taxes, so this adjustment is only for debt, not preferred or common stock.

In addition, it is important to note that we use the YTM here as the before-tax cost of debt instead of the coupon rate. It is easy to think that the coupon rate would be better as that is the actual dollar amount paid to investors each year. However, that ignores the true cost to the firm (return to the investor). If investors pay a premium to buy the bond (pay more than $1000), then the effective cost of the bond will be less than the coupon rate. Alternatively, if investors buy the bond at a discount, then the effective cost of the bond will be higher than the coupon rate. Consider a zero-coupon bond. This is not free financing just because it doesn't pay a coupon payment. Instead, the firm will receive substantially less than $1000 per bond today, but be forced to pay out the $1000 at the bond's maturity with the difference (spread over the life of the bond) representing the cost of interest. The YTM takes into account coupon payments and spreading the premium/discount out over the life of the bond.

While we typically will only encounter one source of debt financing in this class, it is not uncommon for firms to end up issuing many bonds with different coupons and times to maturity. In order to estimate the cost of debt in this type of situation, a weighted average of each bond can be used.