

## Transition from 510A to 510B

The last thing we did in 510A was to establish the concept of the expected return on a bond. We established that the expected return is not necessarily the same thing as the yield to maturity on the bond. Instead, it is equal to the expected return on a risk-free asset *plus* a risk premium. The expected return on a risk-free asset is the yield to maturity on a Treasury bond. We saw that the risk premium on Cat bonds linked to weather disasters is 0 because there is no correlation between the actual (realized) return on the Cat bond and the state of the economy. For corporate bonds, as a rule of thumb, we measure the risk premium as half of the bond's credit spread, which is the difference between the yield to maturity on the corporate bond and the yield to maturity on a similar Treasury security.

Our primary goal in understanding the expected return on a bond is to be able to measure the cost of debt financing to a company. For example if the 10-year Treasury note has a continuously compounded yield to maturity of 3%, a 3M 10-year bond has a continuously compounded yield to maturity of 4%, and an ITT Corp. 10-year bond has a continuously compounded yield to maturity of 5.5%, then the pre-tax cost of debt to 3M is 3.5%, and the pre-tax cost of debt to ITT Corp. is 4.25%.

In the United States, interest paid on debt financing is considered a tax-deductible expense. The value of a business is determined by the present value of *after-tax* cash flows. This suggests that the discount rate used to find the present value of future cash flows is an important ingredient in corporate decision making. Investors lend money and buy stock expecting to earn a rate of return. So we use the after-tax expected return on capital as the discount rate. The 2017 Tax Cuts and Jobs Act lowered the maximum federal corporate tax rate ( $\tau$ ) to 21%. We will use this rate to compute the tax shield from deductible expenses. So the after-tax cost of debt to 3M is  $(1 - \tau) \cdot .035 = 2.765\%$ . And ITT Corp's after-tax cost of debt is  $(1 - \tau) \cdot .0425 = 3.3575\%$ .

The next piece of a company's cost of capital is its cost of equity capital. Equity in public companies like 3M and ITT Corp. takes the form of stock. Just like debt, the systematic risk of a company's stock refers to the extent to which the value of the stock is correlated with the state of the economy.  $\beta$  is a measure of a stock's systematic risk. This is a standardized covariation between the returns on the stock and the returns on the market. The idea is that the stock market is a proxy for the overall state of the economy. So a company whose welfare is independent of the state of the economy would have a  $\beta$  of 0, and therefore a risk premium of 0.

This brings us to our first major block of material in FIN 510B— defining a stock's return.