Bonds (Debt)—Characteristics and Valuation

1. Types of debt and their general characteristics—see the textbook.

2. Bond ratings—indication of the risk associated with the issuer of debt.

3. Bond valuation—present value of the future cash flows that the bond will generate, which include interest payments and the return of the principal amount at maturity (maturity value).

4. Bond valuation model:

\[
\text{Bond value} = \text{INT} \left[ \frac{1 - \frac{1}{(1 + r_d)^N}}{r_d} \right] + M \left[ \frac{1}{(1 + r_d)^N} \right]
\]

- **INT** = interest payment each period
- **N** = number of interest payments remaining until maturity
- **r_d** = investors’ required rate of return to buy the bond
- **M** = maturity (principal) value

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5. Yield to maturity (YTM)—the discount rate that equates the present value of the cash flows that the bond will generate during its remaining life to the current market value of the bond.

\[
V_d = \text{INT} \left[ \frac{1 - \frac{1}{(1 + YTM)^N}}{YTM} \right] + M \left[ \frac{1}{(1 + YTM)^N} \right]
\]

6. Yield to call (YTC)—same as YTM, except in the above equation the call price is substituted for M and the number of periods until the first call can be made, \(N_c\), is substituted for the maturity date, N.
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7. Relationships of bond prices—consider everything else equal; remember that the coupon rate of interest, maturity value, and maturity date are fixed such that they do not change when market conditions change.

a. As the maturity date gets closer, the price of a bond approaches its face value of $1,000 (assuming no default).

b. When market interest rates change, bond prices change in an opposite direction; that is, if interest rates increase (decrease), bond prices decrease (increase).

c. If the market rate, \( r_d \), is greater than a bond’s coupon rate of interest, \( C \), the bond will sell for a discount (less than \( M \)), and vice versa. A bond will sell at its par value only when \( r_d = C \).