- The expected rate of return on a bond held to maturity is defined as the bond's **yield to maturity (YTM)**:

$$\text{Bond price} = \sum_{t=1}^{N} \frac{\text{INT}}{(1 + \text{YTM})^t} + \frac{\text{M}}{(1 + \text{YTM})^N}$$

- The expected rate of return on a callable bond held to its call date is defined as the **yield to call (YTC)**.
- The **nominal** (or **quoted) interest rate** on a debt security, r_d, is composed of the real risk-free rate, r^*, plus premiums that reflect inflation (IP), default risk (DRP), liquidity (LP), and maturity risk (MRP):

$$r_d = r^* + \text{IP} + \text{DRP} + \text{LP} + \text{MRP}$$

- The **risk-free rate of interest, r_{RF}**, is defined as the real risk-free rate, r^*, plus an inflation premium, IP: $r_{RF} = r^* + \text{IP}$.
- **Treasury Inflation-Protected Securities (TIPS)** are U.S. Treasury bonds that have no inflation risk. See ***Web Extension 5B*** for more discussion of TIPS.
- The longer the maturity of a bond, the more its price will change in response to a given change in interest rates; this is called **interest rate risk.** However, bonds with short maturities expose investors to high **reinvestment rate risk,** which is the risk that income from a bond portfolio will decline because cash flows received from bonds will be rolled over at lower interest rates.
- **Duration** is a measure of interest rate risk. See ***Web Extension 5C*** for a discussion of duration.
- Corporate and municipal bonds have **default risk**. If an issuer defaults, investors receive less than the promised return on the bond. Therefore, investors should evaluate a bond's default risk before making a purchase.
- Bonds are assigned **ratings** that reflect the probability of their going into default. The highest rating is AAA, and they go down to D. The higher a bond's rating, the lower its risk and therefore its interest rate.
- The relationship between the yields on securities and the securities' maturities is known as the **term structure of interest rates**, and the **yield curve** is a graph of this relationship.
- The shape of the yield curve depends on two key factors: (1) *expectations about future inflation* and (2) *perceptions about the relative risk of securities with different maturities.*
- The yield curve is normally **upward sloping**—this is called a **normal yield curve**. However, the curve can slope downward (an **inverted yield curve**) if the inflation rate is expected to decline. The yield curve also can be **humped**, which means that interest rates on medium-term maturities are higher than rates on both short- and long-term maturities.
- The **expectations theory** states that yields on long-term bonds reflect expected future interest rates. ***Web Extension 5D*** discusses this theory.

Questions

(5–1) Define each of the following terms:

a. Bond; Treasury bond; corporate bond; municipal bond; foreign bond
b. Par value; maturity date; coupon payment; coupon interest rate
c. Floating-rate bond; zero coupon bond; original issue discount bond (OID)