TIME VALUE OF MONEY

Future value: the value to which a single amount ($PV$) will grow after $n$ years with compound interest at an annual interest rate of $k$ percent is (p. 230)

\[ FV_n = PV(1 + \frac{k}{100})^n \]

Present value: the value today of a single amount ($FV_n$) to be received in $n$ years is (p. 235)

\[ PV = \frac{FV_n}{(1 + \frac{k}{100})^n} \]

Perpetuity: the present value of a perpetual stream of cash flows of $PMT$ per year is (p. 250)

\[ PVP = \frac{PMT}{i} \]

Present Value Interest Factor for an Annuity of $n$ payments at $i$ interest ($PVIFA_{n,i}$): (p. 246)

\[ PVIFA_{n,i} = \frac{1 - \frac{1}{(1 + i)^n}}{i} \]

Future Value Interest Factor for an Annuity of $n$ payments at $i$ interest ($FVIFA_{n,i}$): (p. 242)

\[ FVIFA_{n,i} = \frac{(1 + i)^n - 1}{i} \]

(Ordinary) Annuity: the present value of a stream of $PMT$ per year for $n$ years is (p. 245)

\[ PV = \frac{PMT}{i} \left[ \frac{1}{(1 + i)^1} + \frac{1}{(1 + i)^2} + \ldots + \frac{1}{(1 + i)^n} \right] \]

(Ordinary) Annuity: the future value of a stream of $PMT$ per year for $n$ years is (p. 241-2)

\[ FVA = PMT \left[ \frac{(1 + i)^n - 1}{i} \right] \]

Annuity Due:

\[ PVADUE = PMT \left[ \frac{(1 + i)^n - 1}{i} \right] \]

\[ FVADUE = PMT \left[ \frac{(1 + i)^n - 1}{i} \right] \]

Effective Annual Rate (EAR): the effective annual rate on a loan given a simple rate and $m$ compounding periods per year: (p. 256)

\[ EAR = \left( 1 - \frac{i_{\text{compounding periods}}}{m} \right)^m - 1 \]

PV with continuous discounting: (p. 281)

\[ PV = \frac{FV_n}{e^{-nt}} \]

FV with more frequent compounding: (p. 257)

\[ FV_n = \left( 1 + \frac{i_{\text{compounding periods}}}{m} \right)^{nt} \]

APR = (the periodic rate) * (number of periods per year)

STOCK AND BOND VALUATION

Value of a Bond (p. 287):

\[ V_B = \sum_{t=1}^{n} \frac{C_B + \frac{M}{(1 + k)^t}}{1 + k} \]

Approximation of a Bond's YTM (p. 293):

\[ YTM = \frac{\text{INT} + \frac{M}{(1 + k)^n}}{\frac{M}{(1 + k)^n} - 1} \]

Value of Common Stock (p. 302):

\[ V_C = \sum_{t=1}^{\infty} \frac{D_t}{(1 + k)^t} \]

Value of non-growing stock or preferred stock (p. 303):

\[ \lambda_0 = \frac{D}{(k - g)} \]

Value of constant-growth common stock (p. 308):

\[ k = \sum_{t=1}^{\infty} \frac{D_t}{(1 + k)^t} \]

RISK AND RETURN

Measures of risk and return:

Mean or expected return = probability-weighted average of possible outcomes

\[ \mu = \sum_{i=1}^{n} \mu_i \cdot Pr_i \]

Variance = $\sigma^2$ = mean of squared deviations around the mean

\[ \sigma^2 = \sum_{i=1}^{n} (\mu_i - \mu)^2 \cdot Pr_i \]

Standard deviation = $\sigma = \sqrt{\text{VARIANCE}}$

\[ \sigma = \sqrt{\sum_{i=1}^{n} (\mu_i - \mu)^2 \cdot Pr_i} \]

Expected Return on a Portfolio (p. 193):

\[ k_p = \sum_{i=1}^{n} \mu_i \cdot Pr_i \]

Variance of the Returns of a Two Security Portfolio:

\[ \sigma_p^2 = \sum_{j=1}^{n} \sum_{k=1}^{n} (w_j \cdot \sigma_{jk})^2 \cdot Corr_{jk} \]

Standard Deviation of the Returns of a Two Security Portfolio:

\[ \sigma_p = \sqrt{\sigma_p^2} \]