Net present value of investment

\[ NPV = -Cost + PV \]  \hspace{1cm} (1)

Future value of an investment

\[ FV = C_0(1 + r)^T \]  \hspace{1cm} (2)

Present value of investment

\[ PV = \frac{C_T}{(1 + r)^T} \]  \hspace{1cm} (3)

Net present value of a T-period investment

\[ NPV = -C_0 + \sum_{i=1}^{T} \frac{C_i}{(1 + r)^i} \]  \hspace{1cm} (4)

Effective annual interest rate

\[ \left(1 + \frac{r}{m}\right)^m - 1 \]  \hspace{1cm} (5)

Future value with compounding

\[ FV = C_0 \left(1 + \frac{r}{m}\right)^{mT} \]  \hspace{1cm} (6)

Future value of investment with continuous compounding

\[ FV = C_0 e^{rT} \]  \hspace{1cm} (7)

Present value of a perpetuity

\[ PV = \frac{C}{r} \]  \hspace{1cm} (8)

Present value of a growing perpetuity

\[ PV = \frac{C}{r - g} \]  \hspace{1cm} (9)

Present value of an annuity

\[ PV = \frac{C}{r} \left[ 1 - \frac{1}{(1 + r)^T} \right] \]  \hspace{1cm} (10)

Present value of a growing annuity

\[ PV = \frac{C}{r - g} \left[ 1 - \left(\frac{1 + g}{1 + r}\right)^T \right] \]  \hspace{1cm} (11)

Value of a pure discount bond

\[ PV = \frac{F}{(1 + r)^T} \]  \hspace{1cm} (12)

Value of a level-coupon bond

\[ PV = \frac{C}{r} \left[ 1 - \frac{1}{(1 + r)^T} \right] + \frac{F}{(1 + r)^T} \]  \hspace{1cm} (13)
Value of a consol

\[ PV = \frac{C}{r} \]  

(14)

Value of zero growth (constant dividend) stock

\[ P_0 = \frac{Div}{r} \]  

(15)

Value of constant growth stock

\[ P_0 = \frac{Div}{r - g} \]  

(16)

Formula for a firm’s growth rate

\[ g = \text{Retention ratio} \times \text{Return on retained earnings} \]  

(17)

Stock price after firm commits to new project

\[ \frac{EPS}{r} + NPVGO \]  

(18)

Dividend yield

\[ \frac{Div_{t+1}}{P_t} \]  

(19)

Capital gain

\[ \frac{(P_{t+1} - P_t)}{P_t} \]  

(20)

Total return on an investment

\[ r_{t+1} = \frac{Div_{t+1}}{P_t} + \frac{(P_{t+1} - P_t)}{P_t} \]  

(21)

Expected return of a portfolio of \( x \) and \( y \)

\[ E[r_P] = w_x E[r_x] + w_y E[r_y] \]  

(22)

Variance of a portfolio of \( x \) and \( y \):

\[ \sigma^2_P = (w_x \sigma_x)^2 + (w_y \sigma_y)^2 + 2w_x w_y Cov(x, y) = (w_x \sigma_x)^2 + (w_y \sigma_y)^2 + 2w_x w_y \sigma_x \sigma_y \rho_{xy} \]  

(23)

(24)

Combination between a risky \((S)\) and a risk-free \((F)\) asset

\[ E[r_P] = r_F + \frac{E(r_S - r_F)}{\sigma_S} \sigma_P \]  

(25)

Capital market line

\[ E[r_P] = r_F + \frac{E(r_M - r_F)}{\sigma_M} \sigma_P \]  

(26)

Beta

\[ \beta_i = \frac{Cov(r_i, r_M)}{\sigma_M^2} \]  

(27)

Capital-Asset-Pricing Model

\[ E[r_i] = r_F + \beta_i [E(r_M) - r_F] \]  

(28)