• APR = \( n \cdot \{[1 + EAR]^\frac{1}{n} - 1\} \)

• Compounding. \( V(0) \) today is worth \( V(n) = V(0) \cdot \exp(rn) \) in \( n \) periods. Hence \( r = \frac{\ln(V(n)) - \ln(V(0))}{n} \)

• Present Value: \( P = \frac{C(1)}{1+r} + \frac{C(2)}{(1+r)^2} + \cdots + \frac{C(T)}{(1+r)^T} \)

• Suppose that \( X_1, X_2, \ldots, X_n \) are random variables and \( k_1, k_2, \ldots, k_n \) are constants. Then
\[
E(\Sigma k_j X_j) = \Sigma k_j E(X_j) \quad \text{and} \quad Var(\Sigma k_j X_j) = \Sigma_{i=1}^{n} \Sigma_{j=1}^{n} k_i k_j Cov(X_i, X_j)
\]

• Minimum Variance Portfolio weights (2 assets): \( w_D = \frac{\sigma_E^2 - Cov(R_D, R_E)}{\sigma_D^2 + \sigma_E^2 - 2Cov(R_D, R_E)} \) and \( w_E = 1 - w_D \)

• Maximum Sharpe Ratio Portfolio weights (2 assets): \( w_D = \frac{E(R_D)\sigma_E^2 - E(R_E)Cov(R_D, R_E)}{E(R_D)\sigma_E^2 + E(R_E)\sigma_D^2 - [E(R_D) + E(R_E)]Cov(R_D, R_E)} \)
and \( w_E = 1 - w_D \) where \( R_D \) and \( R_E \) are excess returns over the riskfree rate.