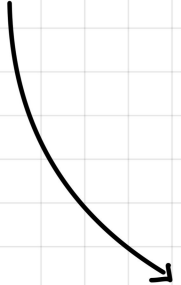


The expected return of a portfolio

Say that your portfolio has n different securities in it,
 $i = 1..n$ the indices of the investment components in your portfolio

For every i : R_i .. the realized (simple) return of the i th component over a particular time period (say, a year)

R_p ... the realized return of the entire portfolio


$$R_p := \frac{P_p^{\text{end}} - P_p^{\text{beg}}}{P_p^{\text{beg}}}$$

Compare to the notion of the effective interest rate in interest theory.

w/ P_p ... the price of the total portfolio,

i.e.,

$$P_p = \sum_{i=1}^n P_i$$

value of the component i

$$R_p = \frac{\sum_{i=1}^n P_i^{\text{end}} - \sum_{i=1}^n P_i^{\text{beg}}}{P_p^{\text{beg}}}$$

$$= \sum_{i=1}^n \frac{P_i^{\text{end}} - P_i^{\text{beg}}}{P_p^{\text{beg}}} \cdot \frac{P_i^{\text{beg}}}{P_i^{\text{beg}}}$$

$$= \sum_{i=1}^n \underbrace{\frac{P_i^{\text{beg}}}{P_p^{\text{beg}}}}_{w_i} \cdot \underbrace{\frac{P_i^{\text{end}} - P_i^{\text{beg}}}{P_i^{\text{beg}}}}_{R_i}$$

w_i ... portfolio weight of investment i
(deterministic)

$$R_p = \sum_{i=1}^n w_i \cdot R_i$$

\Rightarrow the expected return : $E[R_p] = \sum_{i=1}^n w_i E[R_i]$ ✓