PORTFOLIO THEORY – EXERCISES 4

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EXERCISE 1

Given the following series of returns

$R_1 = 0.05,\ R_2 = -0.02,\ R_3 = -0.01,\ R_4 = 0.1$

and the following series of risk-free rates

$R_{f,1} = 0.005,\ R_{f,2} = 0.005,\ R_{f,3} = 0,\ R_{f,4} = 0$

compute the Sharpe ratio

EXERCISE 2

Given the following series of returns, compute the downside deviation with benchmark $B = 0.01$

$R_1 = 0.04,\ R_2 = -0.02,\ R_3 = -0.01,\ R_4 = 0.1,\ R_5 = 0.005$

EXERCISE 3

Consider the set of weights

$$w_{t-1} = \begin{bmatrix} 0.2 \\ 0.4 \\ 0.1 \end{bmatrix} \quad w_t = \begin{bmatrix} 0.2 \\ 0.2 \\ 0.1 \end{bmatrix}$$

Compute the turnover taking into account the effect of the realized returns $R_{t-1} = \begin{bmatrix} -0.1 \\ 0.05 \\ 0.2 \end{bmatrix}$

EXERCISE 4

Consider an equally weighted portfolio of two assets, A and B, which experience the following monthly returns over three periods:

$R_{A,1} = 0.1,\ R_{A,2} = -0.05,\ R_{A,3} = 0.15$

$R_{B,1} = 0,\ R_{B,2} = 0.05,\ R_{B,3} = 0.1$

There are proportional transaction costs equal to 10 basis points.

If we invested 10000 euro in such portfolio (i.e., 5000 in A and 5000 in B) at $t = 0$*, how much money would we have at period* $t = 3$*, net of transaction costs (ignore the initial transaction costs required to start investing at time* $t = 0$*)?*