AcF305: International Financial and Risk Management

Week 10 tutorial questions

1. Consider the following covariance matrix and expected return vector for assets 1, 2 and 3:

$$V = \begin{bmatrix} 0.01 & 0.002 & 0.001 \\ 0.002 & 0.0025 & 0.003 \\ 0.001 & 0.003 & 0.01 \end{bmatrix} \qquad E(r) = \begin{bmatrix} 0.033 \\ 0.0195 \\ 0.025 \end{bmatrix}$$

   a. Done last week.
   b. Done last week.
   c. Done last week.
   d. Is the portfolio considered last week (with weights for assets j=0,…,3 equal to [0.2, 0.4, 0.2, 0.2]) efficient?
   e. Are the following portfolios efficient?
      i. Weights (0.7, 0.1, 0.1, 0.1) for assets j=0,…,3.
      ii. Weights (0.6, 0.2, 0.1, 0.1) for assets j=0,…,3.
   f. What is the portfolio held by an investor with risk-aversion measure λ=2.5?
   g. Assume that there are no outside bills (no external supply /demand for risk-free asset), that is, all risk-free lending and borrowing is among investors. Therefore, the average investor holds only risky assets. What is the portfolio composition? What is the average investor's risk-aversion measure λ?

2. Suppose that your assistant has run a market-model regression for a company that produces sophisticated drilling machines, and finds the following results (t-statistic in parentheses):

$$r_j = \alpha + \beta r_m + \gamma s + e_j,$$

$$r_j = 0.002 + 0.56 r_m + 4.25 s + e_j.$$

$$(0.52) \quad (1.25) \quad (2.06)$$

   Your assistant remarks that, as the estimated beta is insignificant, the true beta is zero. The exposure, in contrast, is significant, and must be equal to the estimated coefficient. How do you react?

3. Suppose that the world beta for a German stock (in euro) equals 1.5, and its exposures to the dollar, the yen, and the pound are 0.3, 0.2, and 0.1, respectively.

a. What is the best replicating portfolio if you can invest in a world-market index fund, as well as in dollars, yens, pounds, and euros?
b. What additional information is needed to identify the cost of capital?

4. Suppose that there are two countries, the US (which is the foreign country) and Canada. The exposure of the company XUS, in terms of USD, is estimated as follows:

$$\tilde{r}_{XUS} = 0.12 + 0.30\tilde{s}_{USD/CAD} + \tilde{\varepsilon}.$$

What is the company's exposure in terms of CAD?