

Home Exercises 1

The first home exercises have to be submitted to email petr.jakubik@eiopa.europa.eu or petrjakubik@seznam.cz till March 31, 2020 at the latest. It can be a team work, group can contain up to three members. The filename needs to have the following structure:

HW1_Surname1_Surname2_Surname3.xls

The first sheet of excel file (cover sheet) has to contain the full names of the group members; each exercise needs to be placed on a separate sheet, an email subject should be "VBA - HW1".

1. Simulate how the value of the firm's share changes for different dividend growth rates (2% - 6%) ceteris paribus and different costs of equity (4% - 10%) ceteris paribus (keeping everything else constant). Next year's anticipated dividend is 50 EUR per share. Use dividend discount model.
 - a. Assume that dividend growth rates do not exceed cost of equity.
 - b. How the situation would change when the dividend growth rate for the first five years is expected at 10%, then between 1% and 3%.

Hint: Use Data Table command.

(15 points)

2. Consider the project that has initial cost of 1 mil. EUR and twenty subsequent cash flows. The cash flows in year 1-15 grow at rate g , so the cash flow in year t is $CF_t = CF_{t-1}(1 + g)$. The initial cash flow is 10 ths. EUR.
 - a) Suppose we want to know how the net present value and internal rate of return are affected by change in the growth rate (1% - 10%). Discount rate is given at level 1%.
 - b) How the net present value would change for different growth rates and also for different discount rates (1% - 10%).

Hint: Use Data Table command and relevant excels' functions.

(15 points)

3. Assume a portfolio composed of 35% of government bonds (average duration 8 years), 30% of financial bonds (average duration 4 year), 25% of non-financial bonds (average duration 3 years). How would the value of portfolio be approximately changed with 2% parallel increase of the yield curve?

(10 points)

4. Create descriptive statistics and charts which describe logarithmic returns (use adj. close prices) and trading volumes for Microsoft Corporation (<http://finance.yahoo.com/q?s=MSFT>) and S&P 500 during the period 1.3.2015 - 13.3.2020. Do not settle for Excel default graph formatting, improve it.

Use these data to calculate Microsoft's β . Use all possible way to calculate it (data analysis| regression, covariance-variance calculation, function slope).

Construct histogram table and histogram chart (bar chart) for Microsoft's logarithmic return.

Simulate Microsoft's daily share price for the following 12 months (250 business days) using historic mean and sigma based on the all historic observations.

(25 points)

5. Set the function $f(X) = X^2 + (1/3)X + 1/2$ to the value 10 by changing X with the help of the Goal Seek feature. Plot the function when X is in the interval $[-15, 15]$.

(10 points)

6. A policyholder pays monthly a fixed contribution into a pension scheme for 40 years, an employer's contribution is 30% of employee's month contribution and a state fixed contribution is CZK 500 monthly. How much would she need to contribute monthly into the pension scheme to receive monthly pension benefit CZK 15 ths. for 20 years. Assume a constant interest rate 1.5% compounded monthly.

(25 points)