

Exercise Sheet #5

Financial Risk Management

1. (Stock portfolio mapping) In today's first exercise, you will use the invest 10000 EUR in five different US stocks, 2000EUR in each.

1. First use the basic approach to calculate VaR on the final day (convert returns to EUR and find the covariance matrix)
2. Then use that the portfolio change can be described as

$$\Delta P = 10000 \times r_{fx} + 2000 \times r_1 + \dots + 2000 \times r_5$$

and calculate VaR

3. Then replace r_i by CAPM relations and disregard the residual risk and compute VaR
4. Finally, regress portfolio returns in EUR on returns of FX and the market index and compute VaR

Is there much difference in the different VaRs? What could be done with the mapping to improve the accuracy of VaR?

2. (Bond portfolio mapping) In today's second exercise, you will consider the bond from (the handed out version of) Chapter 14, but use a bond price data set to compute VaR rather than the numbers given in the book

1. Use bond prices to compute returns, covariance matrix, correlation matrix and volatilities
2. Map the cash flows to the available bonds. Note: You can use four and not three bonds for this dataset as we have bonds with maturity 9 month in the data set
3. Calculate 10-day VaR (using the square root of time rule) and compare with the book – is the VaR higher or lower?