Christian-Albrechts-Universität zu Kiel **WT 2017/18**
Mathematisches Seminar
Prof. Dr. Jan Kallsen
Giso Jahncke Sheet 01

Risk Management

Exercises for participants of programme **Quantitative Finance**

C-Exercise 1
On the olat-webpage of this course you will find a time series containing daily DAX data from 26.11.1990 to 24.10.2017.

(a) Import the time series to *scilab* , extract the close price into a vector $s_1, \dots, s_{6816}$ and plot it.

(b) Compute the daily log returns

$$x_n := \log\left(\frac{s_n}{s_{n-1}}\right), \qquad n = 2, \dots, 6816,$$

and plot them.

(c) Plot a histogram of the log returns using 30 intervals.

(d) Assume that the log returns are independent and identically distributed realizations from a normal distribution with mean μ and standard deviation σ. Give estimators for μ and σ.

Please label the diagrams and give a description of the *scilab* operations in your `sce`-file.

Useful *scilab* commands: `read_csv`, `evstr`, `plot`, `length`, `histplot`, `mean`, `variance`

C-Exercise 2
Assume that the daily log returns of some stock are independent and normally distributed with mean $\mu = 0.0003062$ and standard deviation $\sigma = 0.0143290$.

(a) Generate a random sample $x_2, \dots, x_{6816}$ of daily returns and plot it.

(b) Compute with $s_1 = 1443.20$ the stock price pertaining to this random sample and plot it.

Please label the diagrams and give a description of the *scilab* operations in your `sce`-file.

Useful *scilab* commands: `grand`, `cumsum`

Please save your solution of each C-Exercise in a file named `Exercise_##.sce`, where ## denotes the number of the exercise. Please include your name(s) as comment in the beginning of the file.

Submit until: Thursday, 02.11.2017 08:30 (before the lecture)
Discussion: in tutorials 06.-07.11.2017