Topics in Financial Econometrics with R -MAFINRISK March 2019
Please answer to all questions
Allowed time 90 minutes

Family Name (Surname)	First Name	Student Number (Matr)

Intro

Please refer to the code **factorModels.R** introduced during the lectures.
You will have to modify the version available of the code to answer all questions.

Q1

Please use the file "exam.Rnw" to answer all the following questions.

- Name the data frame berndtInvest as BerndtEquityData.

- Evaluate the structure (i.e. the classes of the columns / variables) and dimensions (i.e the number of rows and columns) of data and display a preview of data.

- Remove "MOBIL" and "RKFREE" data.

- Filter the data over the $1980 - 1985$ time window.

- Create a summary statistics of each column (mean, min, max and standard deviation) over the $1980 - 1985$ period.

- Print the statistics summary table in the Rnw file using package "xtable".

INSERT THE TABLE HERE

Q2

- Define one column as timeseries over the $1980 - 1985$ time window with monthly frequency. Plot the time series and perform the unit root hypothesis testing.

ANSWER HERE

Q3

- Consider all returns for all assets included in the database to estimate an industry factor model in which three industries are considered : ("TECH","OIL","OTHER").

- Describe all the steps needed to the extraction of the three industry factors, then provide the correlation matrix of the residuals from the projections of all returns on the three factors .

- Finally evaluate the performance of three factors model versus the CAPM in explaining the returns of IBM.

ANSWER HERE

Q4

Estimate a single factor model (CAPM) for the returns of all risky assets included in the database plot the cross-section of estimated alphas and their associated standard errors, and the correlation matrix of the idiosyncratic risk. Use this evidence to assess the validity of the single factor model for asset allocation.

ANSWER HERE