Financial Econometrics - Homework 1

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1 Guidelines

- Deadline: April 19, 2019 by email to rombouts@essec.edu, oscarjoel.leonsandoval@essec.edu.
- If you use R, integrate your solutions into R-Markdown allowing you to embed the answers and code in one pdf file. if you use Python, make a Jypyter notebook file.
- Work in groups of 2.
- Explain the code making comments in each step of it.
- Professional presentation and visualisations are part of the evaluation.

2 Moments of stock returns and its stability over time?

We are interested in studying the cross section of stock returns by means of standard descriptive statistics. We also want to know if these statistics are stable over time, particular if they changed since the global financial crisis 2007-2008.

To do this homework, download from Yahoo Finance daily adjusted closing prices (from the earliest date available) for each stock in the S&P 500 and the S&P 500 itself, transform them in percentage log returns (501 series). To do this find the ticker list of the S&P 500

index and loop over this list.

QUESTIONS:

1. Calculate the mean, variance, skewness and kurtosis coefficient for each stock and store them in a 500 x 4 matrix. Compute nonparametric density estimates for each the four statistics (you have 500 values for each statistic) and make four plots. Add to the plots a normal distribution with mean and variance equal to the mean and variance of the variable plotted. Comment.

2. Calculate the coefficient of correlation between each stock return series and the S&P 500 index return. Compute nonparametric density estimates and make a plot. Comment.

3. Do steps 1 and 2 for the period previous to 2007 for the stocks for which data is available. Comment.

4. Do steps 1 and 2 for the period 2009 to date. Comment.

5. Given your answers for the previous two questions and using a Kolmogorov Smirnov test, verify if there is stability over time. Comment.

3 EXTRA FOR THE FAST (for fame only)

Redo the analysis for the Euro Stoxx 50. Summarise your findings.