Econometrics and Financial Markets Project

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Objectives: Apply statistical methods to estimate and test economic and financial relationships on real databases.

The case study will be realized by groups of **3 or 4 students** with the software XLSTAT.
You will have to submit on Campus:

- An Excel file containing the data (the name of the file should be ***data1_namesof students.xls***)
- A Word (or pdf) file reporting tables and plots and summarizing and interpreting the results (***report1_namesof students.docx***)

❖ NB it is important to submit both files (the Excel file or word file alone will not be considered)

Submission date: 22 April 2022

Data: to be downloaded using any financial website (Bloomberg, Yahoo finance… see below for useful data links):

- **monthly historical prices for one asset for at least 5 years (recent data!)**
- **monthly values of one market index (defined on the same market) on the same period**
- **monthly values of a "risk-free rate" (treasury bond at 1 or 3 or 6 months) on the same period**

Report: Your report should contain all XLSTAT tables and graphs useful for your analysis as well as the comments and interpretations for each of them. More precisely, you should develop the following items:

1) **Presentation of the data**: which assets you have selected, on which period. Detail the transformation done on the data (e.g., from prices to returns). Plot of prices and returns series and comment.
2) **Descriptive statistics on the transformed data**: table including min, max, mean, SD, median, skewness, kurtosis. Normality test and histogram. Comment on descriptive statistics and normality.
3) **Autocorrelation function** of the times series of prices and returns. Comment on stationarity.
4) **CAPM model.**
    a. Present the CAPM equation and the variables you will use to test it.
    b. Present the results of the regression with the XLSTAT table containing the estimation of the coefficients and the Student tests. Comment the R^2 value, the value of the coefficients and the t-tests.
    c. Plot the residuals over time and check the residuals assumptions: normality, non autocorrelation and homoscedasticity.
    d. Adapt the estimation procedure if some hypotheses on the residuals are violated.
    e. Interpret your results. What is the conclusion of your model?
5) **Extension to multiple regression**.
    a. Run another regression using size and/or book/market or other factors that could be related to the model (see below for useful data links: Fama-French factors).
    b. Comment the results of this new regression: R^2 value, significance and sign of the new coefficients.
    c. Compare with the results on the CAPM, interpret and conclude.

Useful Data links

- TBS Library Services provides a broad portfolio of specialist business resources, including **Bloomberg** (Alaric library in Toulouse or Paris Campus)**, Datastream** (Refinitiv online access – ask Helpdesk), **Infinancials**, **Orbis**, etc
- https://bibliotheque.tbs-education.fr/nos-bases-de-donnees.aspx

- Also, available on the web:
  - Yahoo Finance: https://finance.yahoo.com/
  - Google Finance: https://www.google.com/finance/
  - Fama French Factors: http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html
  - Federal Reserve Bank: https://fred.stlouisfed.org/
  - Fanque de France: https://www.banque-france.fr/page-sommaire/taux-et-cours