Introduction to Financial Econometrics 23rd January 2019

Please answer to all questions

Allowed time 90 minutes

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

Please refer to the code **exam2019_01.R** that works on the dataset ffdata.csv generated in one of the first session of the course . The version available of the code just installs all relevant packages and loads the database, you will have to write the rest of the code (by referring to all codes seen over the course) to answer all questions. The pass level for the exam is 18 points. All marks above 18 will be rescaled to fit the Bocconi benchmark distribution.

Q1 (**4 points**)

Construct a subset of the data table "dataff" which contains observations on the variables exret_mkt, MOM, SMB, HML, RMW, CMA, PR33 for the sample 1982:1-2013:12. Please report the command lines that you use to this end

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Q2 (6 points)

Indicate the max and the minimum monthly returns observed in the sample and the portfolios that featured them. Indicate a 50 per cent confidence interval for the monthly returns on PR33

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Q3 (4 points)

Indicate the value in 2013:12 of one dollar invested in 1982:1 in the PR33 portfolio with a buy-and-hold strategy

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Q4 (4 points)

From a graphical analysis which of the following series can be considered as stationary : MOM,SMB, HML, RMW,CMA ?

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Q5 (6 points)
Assess the presence of persistence in the PR33 and PR33^2. Report the estimated coefficients for the first three lags of the autocorrelation function and assess their significance

Q6 (8 points)
Perform an OLS regression of PR33 on exret_mkt and a constant, report all estimated coefficients and a test for the null that the coeffcient on exret_mkt is 1. Then specify a GARCH (1,1) model for the residuals an report all estimated coefficients in the model with associated standard errors. Comment on the implications of the statistical significance of the estimated coefficients.

Q7 (8 points)
Run two regressions 1) PR33 on a constant and exret_mkt 2) PR33 on a constant, exret_mkt,HML, SMB,MOM,RMW, CMA. Test the joint significance of HML, SMB,MOM,RMW, CMA. What is the partial R square of HML and SMB in model 2? Estimate a model in which you impose the restriction that the coefficients on MOM and CMA are zero and that the coefficient on HML and SMB is the same. Report the value of this estimated coeffcient together with a test for the null that it is equal to .5