

Exercise 4

Consider the dataset 2010CL_BL.xls and perform the following tasks:

1. Construct a time series for the daily returns in EURO of a portfolio equally invested in MSCI_EURO, MSCI_USA, MSCI_UK over the period 1/1/2006-31/12/2009. Assess their normality via QQ plot and Jarque-Bera tests.
2. Estimate a GARCH with leverage model over the same period and assess normality of the standardized returns.
3. Simulate returns for the available sample using a GARCH with leverage model, calibrated on the basis of the estimation obtained in the previous point with normally distributed residuals. Evaluate the normality properties of returns and standardized returns.
4. Compute Value at Risks of the portfolio for each day of 2010 using respectively a Normal quantile, a student-t with the appropriate number of degrees of freedom quantile and a Cornish Fisher quantile and compare the results.