Financial Engineering

Homework 2

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Testing for IIDness

We want to be able to test null hypothesis time series $\{x_t\}$ or set of residuals is Independent Identically Distributed

1. Visual test :
    1. Comparing Histograms – 2 halves of data
    2. The second test consists of the scatter-plot of the time series on one axis against its lagged values on the other axis. In other words, we compare the following two series:

$$x_t \text{ versus } x_{t-\widetilde{\tau}}, \qquad t = \widetilde{t} + \widetilde{\tau}, \ldots, T.$$

If Xt is an invariant, in particular all the terms in the series are independent of each other: therefore the scatter plot must be symmetrical with respect to the reference axes. Furthermore, since all the terms are identically distributed, the scatter plot must resemble a circular cloud.

Homework 2

Data set 8 asset classes daily prices from Jan 1999 to 8/12/2016. Using Data set provided in Homework 1:

1. Calculate linear and compounded returns
2. Are they invariants ? Slide 2. Visual test. Using Python

Please submit in 1 week