Cointegration [TD]

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Libraries

It is everything contained in statsmodels.

The adjusted Dickey-Fuller test

```
from statsmodels.tsa.stattools import adfuller
```

The Cointegration test:

```
from statsmodels.tsa.stattools import coint
```

The linear regression:

```
from sklearn.linear_model import LinearRegression
```

Asymmetry of Cointegration

Being the cointegration asymmetric you must be careful on the order

if $\mathrm{coint}(\mathrm{Y}, \mathrm{X})$ is significant then one has to regress

$$Y_t = \widehat{\alpha} + \widehat{\beta}\, X_t + \hat{u}_t$$

TD

Load the “logret_russel1000_pairtrad.csv” and obtain log-prices

Split the date in in-sample (252 days) and out-of-sample (252 days).

Select the subset of stocks that are I(1) in the in-sample.

Select the pair of cointegrated stocks [Bonferroni correction]

Compute the residue of the cointegrated pairs, and characterize with an ARMA(p,q)

Check if this mean reversion behaviour persists in the out-of-sample.