MLT-05 Statistical Arbitrage with PCA

Overview

This session will help you learn one of the most widely used classes of quantitative trading strategies that is "Statistical Arbitrage", which is often understood in a limited sense as "pairs trading" but can also be generalised to portfolios with multiple assets

Key Takeaways from the lecture:

- Understand principal component analysis
- Alpha factors recap
- Different types of back-tests
- Cointegration deep dive
- Statistical arbitrage strategies for large portfolios

Pre-reading/Pre-lecture tasks:

- None

Downloadable File

- Link: https://github.com/rodler/quantinsti_statarb/blob/master/PCA_2.ipynb

Practical use of the topics learned in this session:

- The aim of the lecture is to get a sense of how to use Principal Component Analysis (PCA) for statistical arbitrage strategies.
- Investigate the idea of abstract factors and perform a principal component analysis from scratch using standard NumPy library
- A market data simulator for multiple co-integrated assets is built and the simulated data are then used to create a back-test.
- Application of the algorithm from part two to real market data from the Quantopian research environment. The performance of the back-test on various sector portfolios is examined.

Additional Read

Blog: Arbitrage Strategies: Understanding Working of Statistical Arbitrage

Recommended time for the session & related coursework - 6 hours