Homework: Benchmarking Simple Spread Trading

Tuesday 12th April, 2016

1 Introduction

We will study the risk and return of simple spread strategies, and compare them to benchmarks.

2 Data

Obtain split- and dividend-adjusted closing prices for 2 Dec 2013 though 31 Dec 2015 of all pairs of ETFs as specified below. Obtain daily Fama-French factor returns[1] (SMB, HML, RF and Mkt-RF) over the same data period.

2.1 ETF Pairs

ETF pairs X,Y are:

0. RYU XLU
1. IST IYZ
2. RING GDX
3. XSD SMH
4. PBE XBI

[1] Available on Quandl or Ken French's website

5. IEO XOP
6. PXJ OIH
7. RTH XRT
8. SIVR SLV
9. HYLD JNK

3 Exercise

3.1 Simulations

We will use the same specification as in the previous homework. Set $M = 20$ trading days. Turn off stop-loss (for example by setting $s = \infty$) and choose a reasonable j, g for each ETF pair. Simulate spread-trading returns over the entire data period using the same assumption for capital K as before.

3.2 Analysis

Compute Sharpe and Sortino ratios for simulated returns on each spread. Contrast the performance of the 10 spreads with each other.

Use ordinary least squares (OLS) regressions[2] to analyze the relationship between simulated returns on each spread and the Fama-French factors in two ways:

1. Using single-dimensional "individual" regressions separately on each factor ($10 \times 4 = 40$ OLS regressions total).
2. Using a multivariate regression on all factors at once (10 OLS regressions in total)

For each pair, and each regression, compute Sharpe and Sortino ratios of the residuals. Contrast the results. Assuming you could hedge using Fama-French factors, how much improvement in performance could you achieve (if any)?

As always, ensure your name and student number appear at the top of your analysis document.

[2] In **R** you can use the `lm()` function for this. In Python, `statsmodels.regression.linear_model.OLS()` works well.