Homework exercise 4

Deadline: upload to Moodle by 19 April 18:00 h

Suggestion: take this notebook and simply add your code and explanations.

If you prefer to use .py files, you are expected to also include a PDF containing the output of your code and your explanations. Still, the code needs to be in a form that can be easily run on another computer.

Name 1:

Name 2:

Name 3:

The file that you upload should be named *Homework4_YourLastName_YourStudentID*.

Reminder: you are required to attend class on 20 April to earn points for this homework exercise unless you have a valid reason for your absence.

You are allowed to work on this exercise in groups of up to three students. If any part of the questions is unclear, please ask on the Moodle forum.

Momentum and trading volume

In this exercise, you are asked to obtain some stock market data and to compute and plot returns of certain investment strategies.

1. Please download data (over the whole available time period) for the stock symbols CSCO, GE, F, MSFT, AIG, JPM, AMGN, BRK-A, IBM, and AA for the period 1995 to 2020. Plot the cumulative returns of all of these stocks in a single figure.

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1. The goal now is to first consider returns of simple momentum/reversal investment strategies. A momentaum (reversal) strategy invests in recent winners (losers) and takes a short position in recent losers (winners). Assume that whenever you change your portfolio (i.e. at the opening price on every day, week, or month), you invest the same amount in each position, and compute the returns of strategies that

- every day take a long position in the previous day's 5 worst performing stocks and a short position in the previous day's 5 best performing stocks.

- every week take a long position in the previous week's 5 worst performing stocks and a short position in the previous week's 5 best performing stocks.

- every month **t** take a long position in the 5 stocks performing best during the months **t-6** to **t-2** and a short position in the 5 stocks performing worst during that period.

Plot the cumulative returns of each of these strategies and provide descriptive statistics of the one-period returns.

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1. We next consider a refinement of the above strategies that takes the trading volume in each stock, relative to the stocks' own historical volume, into account. To prepare for this step, compute for each stock

- every day the trading volume (in shares) on that day relative to the trading volume on the previous 10 trading days
- every week the trading volume (in shares) in that week relative to the trading volume during the previous 4 weeks
- every month the trading volume (in shares) during the months **t-6** to **t-2** relative to the trading volume in the previous 10 months

Next, adjust the investment strategies from 2. such that you always take long and short positions, respectively, in the 2 among the 5 stocks that had the highest recent trading volume (relative to their past volumes, computed as above).

Plot the cumulative returns of each of these strategies and provide descriptive statistics of the one-period returns.

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