Coursework 2025: Enhancing a standard Momentum Factor using Lou and Polk (2021)

Note: The paper by Lou and Polk (2021) is available using the following link: https://personal.lse.ac.uk/loud/comomentum.pdf

The paper uses a novel measure of arbitrage activity which the authors call comomentum in order to forecast when a momentum strategy is likely to generate strong returns and when it is likely to generate weak returns. Comomentum is measured as the high-frequency abnormal return correlation among stocks on which a typical momentum strategy would speculate. When comomentum is low, momentum strategies are likely to generate strong future returns and when comomentum is high, momentum strategies future returns are likely to be weak.

The objective of this project is to construct an enhanced momentum trading strategy using a simplified version of the paper's comomentum measure.

The following CSV and Excel data files are provided:

US_Returns.csv (in USD)
US_live.csv
US_Dates.xlsx (in YYYYMMDD format)
US_Names.xlsx
FamaFrench.csv

The CSV files consist of a two-dimensional array of dimension TxN where T is the number of weekly dates in the sample and N is the number of companies. The file US_Dates.xlsx contains a weekly "dates" vector of length T and the file US_Names.xlsx contains a "names" vector of all the stocks in the sample data (N).

Here is a more detailed description of the CSV files:

US_Returns.csv: Weekly total stock returns (including reinvested dividends) in decimals.

US_live.csv: A dummy variable which indicates when a company was live (dummy = 1) and when it was dead (dummy = 0).

FamaFrench.csv: Weekly factor returns of the three Fama-French factors, namely the market excess return over the risk-free rate (Mkt-RF), the size factor (SMB) and the value factor (HML). The risk-free rate (RF) is also given but it is not a separate factor.

Perform the following tasks:

(1) Load the data files.

(2) For each stock at each point in time, compute a standard momentum factor over the last 48 weeks skipping the most recent 4 weeks (this corresponds

approximately to a momentum factor computed over 11 months skipping the most recent month which is generally used by both academics and practitioners).

(3) Run Fama-MacBeth regressions weekly throughout the sample period regressing one-week ahead stock returns on one-week lagged momentum exposures. Collect the regression coefficients (factor returns) in a vector. In this step you need to take into account any potential missing values (either in the returns for a given day (y-variable in the regression) or the momentum factor (x-variable in the regression)). Any company with missing values for either of these two variables needs to be excluded from the regression for that week. At each point in time the regression should only include observations for live companies.

(4) Compute the comomentum measure that the paper describes (without the industry adjustment) by regressing the last 52 weeks of each stock's returns on the three Fama-French factors and then using the regression residuals to compute return correlations as described in the paper. These computations need to be updated week by week throughout the sample period using a rolling window of 52 weeks.

(5) After you have computed the comomentum time series, think about which adjustments you could make to the standard momentum factor computed above in order to improve its effectiveness using comomentum. Note: There are many ways how this could be done. Think about an adjustment that makes sense given the findings of the paper.

(6) Compute your adjusted momentum factor and then re-run the Fama-MacBeth regressions described in (3) but this time using the adjusted momentum factor.

Graph the cumulative factor returns for the two momentum versions. Also compute annualised mean returns, standard deviations and any other statistics that you think would be useful to compare the factor return series over the entire sample period. Describe and interpret the results in a brief report.

<u>Additional Notes:</u>

- When you use the sample code I provided on Moodle during the class you will need to make some changes to it to take into account that there is sometimes missing data. The code currently does not take this into account because it is only used on "idealised" data without missing values. The course project uses real data which, unfortunately, is a bit more messy.

- I am only interested in the analysis described above. The papers performs a lot of additional calculations, robustness checks, etc. which you can ignore for the purposes of the project. I would however encourage you to read and try to understand the entire paper.

- If you make certain assumptions to go through the analysis, please mention them in your report.

Please always feel free to ask me any questions you might have. I am always happy to help!

Please submit the completed course project **by Wednesday 26th March 2025.**