QFAT – Group Project

Datasets

NL_FR_BE_data_monthly.csv
Monthly data for 1846 firms from the Netherlands, France and Belgium
Sample period: 1991/06 – 2020/06

Variables:

ISIN:	International Securities Identification Number
mdate:	Date in format yyyymm
RET:	Return (in month t)
RET11:	Return over the past 11 months (including month t)
ME:	Market equity (size) in million US$ (at the end of month t)
b:	Market beta from a regression of daily firm excess returns on the three FF factors over the past 12 months (including month t)
h:	HML beta from the same regression as above
s:	SMB beta from the same regression as above
ivol:	Standard deviation of residuals from a regression of daily excess returns on MktRF (in month t)

NL_FR_BE_data_annual.csv
Yearly data for 1846 firms from the Netherlands, France and Belgium
Sample period: 1990 – 2019

Variables:

ISIN:	International Securities Identification Number
fyear:	Fiscal year
BEME:	Ratio of book equity to market equity (as of the end of fyear t)
OP:	Operating Profitability (in fyear t)
INV:	Investment (from fyear t-1 to fyear t)

NL_FR_BE_firms.csv
Static information on 1846 firms from the Netherlands, France and Belgium

Variables:

ISIN:	International Securities Identification Number
name	
country	
dscode:	Identifier for Datastream

Source: Datastream

Europe_FF_Factors.csv
Factor returns:

Rf:	Risk-free rate
MktRF:	Market excess return
SMB:	SMB excess return
HML:	HML excess return

Source: http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html

Assignment: Build your own quant strategy

Your task is to construct a quantitative trading strategy that delivers alpha for your Hedge Fund.

- It must be based on ex-ante available information (tradable!).
- It can be a pure stock selection strategy or a combination with a timing strategy.
- You can combine any of the signals available or create new ones from them.
- All weighting schemes are accepted – equal weighting, weighting based on size (market equity), volatility-weighting, or something else. Just make sure it is ex-ante available information!
- A pure momentum strategy and a pure combination of value and momentum is off limits (but it can be part of your combination strategy).
- The given stocks and the risk-free asset are the only investment opportunities, i.e., there are no funds that allow you to simply buy HML, SMB, or other international assets.
- The quantitative evaluation criterion will be the Information Ratio with respect to the three Fama-French factors (MktRF, HML, SMB).

Some ideas:

Ang, Hodrick, Xing and Zhang (2006): The Cross-Section of Volatility and Expected Returns, Journal of Finance 61, pp. 259-299.
Asness, Moskowitz and Pedersen (2013): Value and Momentum Everywhere, Journal of Finance 68, pp. 929-985.
Daniel, Mota, Rottke and Santos (2020): The Cross-Section of Risk and Returns, Review of Financial Studies 33, pp. 1927-1979.
Frazzini and Pedersen (2014): Betting Against Beta, Journal of Financial Economics 111, pp. 1-25.

In your **10-minute** presentation, I want you to pitch your strategy to the investment committee. Your job is to convince them to approve trading on this strategy and to include it to its current portfolio, which currently consists of one European market ETF. The presentation will be graded, and the grade will not simply be given based on the best performance, but rather on how convincing your presentation was. You will also have to upload your code.

Some tips:

Backtesting results
- Calculate appropriate performance and risk measures
- Provide plots to show performance over time
- Any helpful additional information about diversification, turnover, the types of stocks you are trading (for example, their size), etc. is appreciated

Economic reasoning
- Briefly argue, why you think the strategy works (mispricing vs. risk premium) and why you are convinced that it will continue to work.
- Comment on expected trading costs, potential leverage and capacity.

In our last session, we will see how your strategy performs out-of-sample. I will provide those data after your presentations. Make your code sufficiently flexible to easily exchange the data for this out-of-sample test. The evaluation criterion, again, will be the Information Ratio with respect to the three Fama-French factors (MktRF, HML, SMB). Within each tutorial group, the group with the highest **out-of-sample Information Ratio** will get 3 extra points for the exam, the group with the second-highest will get 2 extra points, and the one with the third-highest will get 1 extra point.

In order to be eligible for the bonus points, the initial group project submission must include:
- A code file that is well-documented, understandable, and easy to run out-of-the-box
- A slide in the appendix that describes the algorithm step by step, with all parameter choices etc., in natural language, so that it can be replicated in any programming language

In case either running the code or replicating the code based on the description does not work out-of-the-box, the group loses eligibility for the bonus points.