

Project

A few years ago, an interesting debate about the potential merits of **factor timing** started. On one side of the debate, some major players like Rob Arnott and his firm Research Affiliates suggested that **factors** can become expensive and that investors should time their exposures to buy low and sell high. Arnott and his co-authors have made this argument together with suggestions for factor timing in a series of papers. On the other side of the debate, Cliff Asness, founder of AQR Capital Management, initially argued that factor timing is deceptively difficult. Asness has challenged the methods and arguments proposed by Arnott. In another series of papers Asness and co-authors argue that factor timing may be about as difficult as market timing.

Take one or more factors like momentum and/or value. The idea is like what you have already explored but with the goal of timing factors instead of timing the market. Your strategy should be evaluated **out-of-sample**. **Test at least three different timing variables** and demonstrate whether the timing variable helps or not with statistical significance. **One of the timing variables should be based on some observable macroeconomic variable**. For instance, interest rates, equity market returns, etc. **Another timing variable could be based on recent factor performance** so the timing strategy would dial down the risk budget when the factor returns are weak, and dial it up when they are strong.

Can **ML models boost your performance?** **Test at least three different models** and demonstrate **whether they help or not with out-of-sample R_{OS}^2** .

Also explore **different approaches to manage trading costs**. A quantitative asset manager seeks an optimal trade-off among three competing concerns: **maximize expected portfolio return, minimize portfolio risk, minimize trading costs**. You can explore assuming the same level of proportional transaction cost applies to every transaction and re-evaluate the performance of your strategy. **Choose various level of proportional transaction costs**: 10 basis points (bps), 20 bps, 50 bps, etc. Determine how high can the proportional transaction costs get before the premium of your strategy vanishes. You could also assume quadratic transaction costs. This corresponds to the case when market impact is linear, that is, the per-dollar transaction cost is proportional to the volume transacted. In this case you can investigate what is the “capacity” of your strategy. That is, **how much capital can you invest before the premium disappears**.

Tweak your investment strategy to be mindful of these transaction costs. For example, play around with the frequency of portfolio rebalancing and with some kind of turnover constraints.

The projects will be completed in your groups with one submission per group. All groups are required to submit a report describing their project findings. All groups are required to submit their project report by the due date at 11:59pm. Maximum 5 pages.