6 Deliverable for the project

You have to submit the following.

1. A report presenting your findings and conclusions about the impact of the estimators on the behavior of your strategy, and also what kind of estimators would recommend to use. When would you recommend a given estimator and why? (You may want to look at what happens during crisis periods such as subprime or COVID). Keep in mind that you have 2 axes of analysis: sensitivity to the term-structure of estimators (short-term, mid-term and long-term) for covariance and expected returns and sensitivity to the target β_T.

2. The report should contain a clear description of the notations and strategies you have analyzed, the graphs and summarizing tables supporting your quantitative and qualitative analysis. You can include a brief description of the computational engine you have built but do not include the code in the core of your report.

3. Submit also the code developed for the project and all supporting graphs, tables and simulation results in a Zip file. The code should ready to run when unzipped and with minimal directions to the evaluators. The submitted code will be tested for comparison and it is a requirement to build your code in a modular and clearly documented manner..

Appendix

A Practical aspects

For estimation of the parameters of the factor model, you can use a cross sectional regression model by gathering all the individual securities model in a single "big" factor model. If you assume, that you have 3 factors, then the model at time t for each asset is given by

$$r^e_{it} = \alpha_i + \beta^3_i(r_{Mt} - r_{ft}) + b^s_i r_{SMBt} + b^v_i r_{HMLt} + \alpha_i + \varepsilon_{it} \tag{5}$$

with $r^e_{it} = r_{it} - r_{ft}$, and moreover the ε_{it} are independent of the factors and satisfy

$$cov(\varepsilon_{it}, \varepsilon_{js}) = \begin{cases} \sigma^2_i \text{ when } i = j, \text{ and } t = s \\ 0 \text{ otherwise.} \end{cases}$$