Machine Learning for Stocks: When the Cross-Section Meets the Time-Series

Keywords: Empirical Asset Pricing, Anomalies, Return Predictability, International Stock Markets

Project description

In an influential study, Gu, Kelly, and Xiu (2019. Empirical asset pricing via machine learning, Review of Financial Studies, 33, 2223–2273) find that machine learning approaches can predict future stock returns and are helpful to construct profitable trading strategies. In our paper, we have validated this insight for an international dataset with partly larger profits for machine learning approaches (Azevedo, Kaiser, Müller (2022. Stock Market Anomalies and Machine Learning Across the Globe, Working Paper, TU Munich, TU Kaiserslautern)). Both studies only focus on cross-sectional features/predictors, i.e., features/predictors that vary across stocks (like firm market capitalization).

This IDP should extend these two studies by combining cross-sectional and time-series features (e.g., inflation, unemployment rates, etc.) and investigating potential performance gains. For instance, Leippold, Wang, and Zhou (2020. Machine-Learning in the Chinese Factor Zoo, Working Paper, University of Zurich) successfully combine stock predictors with macroeconomic indicators in machine learning applications.

To this end, the students receive an existing data set of international stocks and stock predictors. This dataset must be enriched with selected time-series predictors (selected together with the supervisors). Based on an already existing code for machine learning, you will have to modify, test, and apply this code (written in R and Stata). The code must be flexible so that it can handle future data updates and changes in the list of features. You will have the opportunity to conduct your own asset pricing study for this IPD. Specifically, you are asked to test the performance of your machine learning approaches using the sample of international stocks. Upon completion of this project you will have acquired substantial knowledge about capital market databases, empirical data analysis, and the functioning of financial markets in general. Among others, these skills are of high practical relevance for jobs in Banking, Asset Management, and Fintech.

What we are looking for

- Strong analytical and project management skills
- Determination and passion for your areas of expertise
- IT skills required for the IDP
- Interest to learn something about finance, in particular asset pricing, asset management, fixed income.
- 1 or 2 persons

What we offer

- Knowledge in quantitative finance, corporate finance and corporate governance
- Kick-off session including introduction to relevant finance and/or business topics
- Experience with IDPs
- Open dialogue and support
- Access to prime capital markets databases (Bloomberg, Datastream, Thomson Reuters, etc)
- Potential for publication and/or evaluation of future use cases
- Both single and group projects are possible

Interested?

Please send an e-mail with CV, academic transcript and your preference for this project to lisa.knauer@tum.de.