

Optimizing Stock Portfolio Strategies: A Machine Learning Approach with Factor Investing

This study investigates portfolio investment strategies using factor investing also called smart beta. The aim of this study is to implement different machine learning algorithms into portfolio strategies with the goal to outperform a market cap weighted portfolio. The machine learning algorithms are used in order to predict the future price of a stock or its probability to outperform other stocks. The study is conducted over a dataset including 240 monthly observations of 30 stock's price from 2000 to 2019, and 5 smart betas associate to those observations. The machine learning models included in this study are: Regression, Feedforward Neural Networks (FNN), Long Short-Term Memory (LSTM), Decision Trees Classifier and Feedforward Neural Networks Classifier (FNNC).

To run the project, you need to have the following libraries on Python:

- Matplotlib
- Numpy
- (- Openpyxl)
- Pandas
- (- Pyreadr)
- Random
- Sklearn
- Statsmodels
- Tensorflow

The program is runned in Python a Jupyter Notebook.

The code open a dataset called dataframe.xlsx

The original dataset is caled data.Ddata and has been converted to dataframe.xlsx

If you have any questions, please contact me at nicolas.ferrara@unil.ch