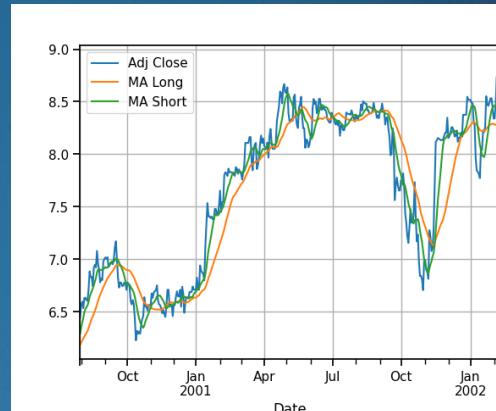


W U T I S



MA Cross Trading on a risky asset

Fellowship assignment
Denys Shkola

Data, signals, parameters and challenges

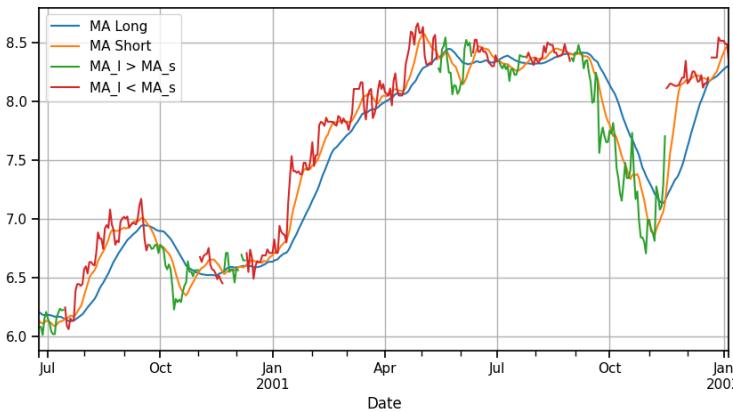
Risky asset and model

As a risky asset Erste Bank AG stock is chosen to test the model performance for high volatility stock.

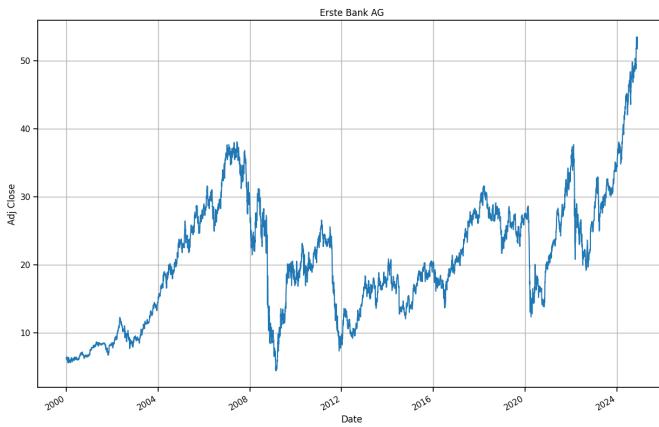
The model should create the signals whenever short and long period moving average cross.

Challenges

To test the performance of the model one should train the hyperparameters for MA periods and test them on different scenarios as well as generated ones(using Monte Carlo simulation)



Erste Bank AG 2000-2024



Data Sources

- YFinance
- FRED

Backtesting

W U T I S

Model training, testing, performance evaluation

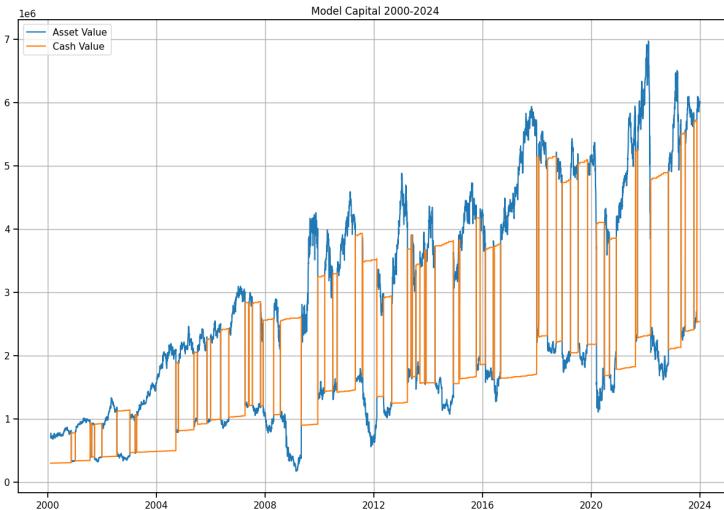
Result

MA Cross vs. Buy and Hold

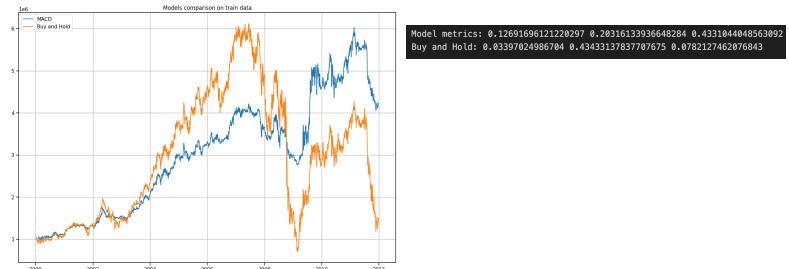
- Returns volatility of the model on the test data is lower than benchmark strategy
- Model deals with risk, although the returns are lower, they are more stable
- Annualised returns beat the Austrian inflation rates



Model cash and asset allocations(entire timeframe, all possible signals)



Returns	Volatility	Sharpe Ratio
Model metrics: 0.039725254317730885	0.181843810031546	0.19057648562546733
Buy and Hold: 0.06964334253521964	0.3443469150470568	0.20224761568054855



Scenario analysis

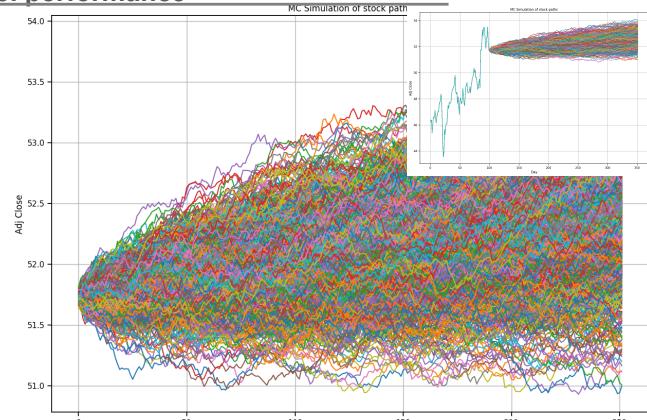
W U T I S

Performance on MC simulated paths

Result

- Model handles new generated(from ann.results and volatility) data pretty well with small VaR
- Volatile scenarios are smoothed, so the profits positive and stable as well

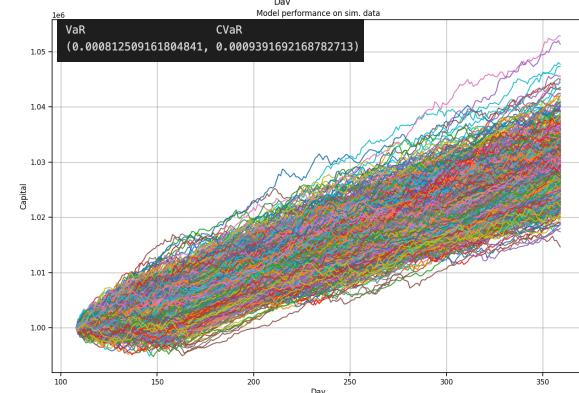
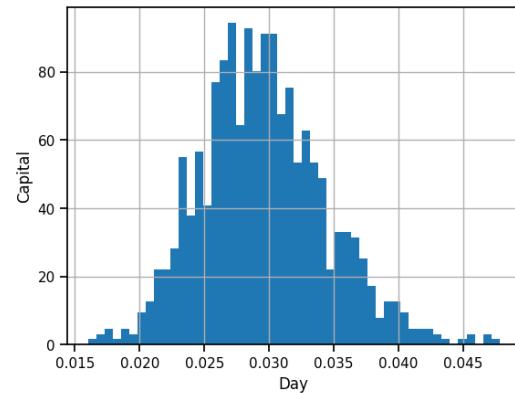
Monte Carlo simulation and model performance



Disadvantages

- Real stock data is not distributed normally
- MC calculations are based on earlier stock metrics

Returns distribution on sim. data



FED rate changes scenarios

Scenarios

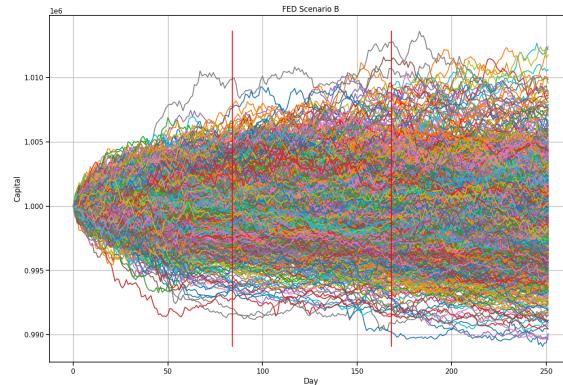
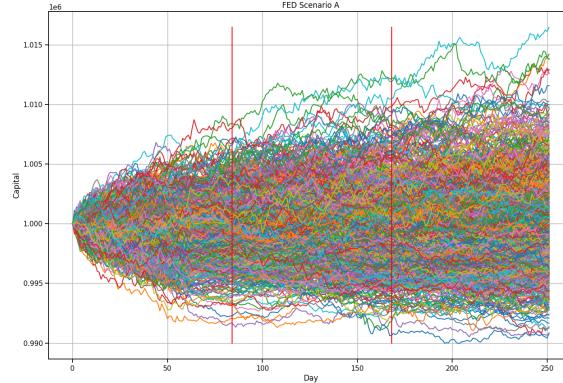
- FED raising IR by 25 bps with 60% probability
- FED dropping IR by 25 bps with 70% probability

Monte Carlo + CAPM and model performance

Adjustment

- Beta for CAPM was derived from past adjusted market and asset returns using Least Squares method

Beta for CAPM
0.7566869514636116



Result

- Model handles new generated(from ann.results and volatility) data pretty well with small VaR
- Volatile scenarios are smoothed, so the profits positive and stable as well
- FED rate drop/raise have little to no impact on the model