

Performance Measure: PI

Author: Sven Kohler

23.5.2021

Implement performance measure

convex combination of average excess return and variance (annualized)

$$\Pi_p = \lambda * (R_p - R_f) - (1 - \lambda) * \sigma_p^2$$

Cross sectional standard deviation of average geometric returns and SDs

$$avg_ret_i = \left[1 + \left[\prod_{t=1}^{T_i} (1 + (return_t - rf_t)) \right]^{\frac{1}{|T|}} \right]^{252} - 1$$

$$SD_ret_i = \sqrt{Var(ret_i) * 252}$$

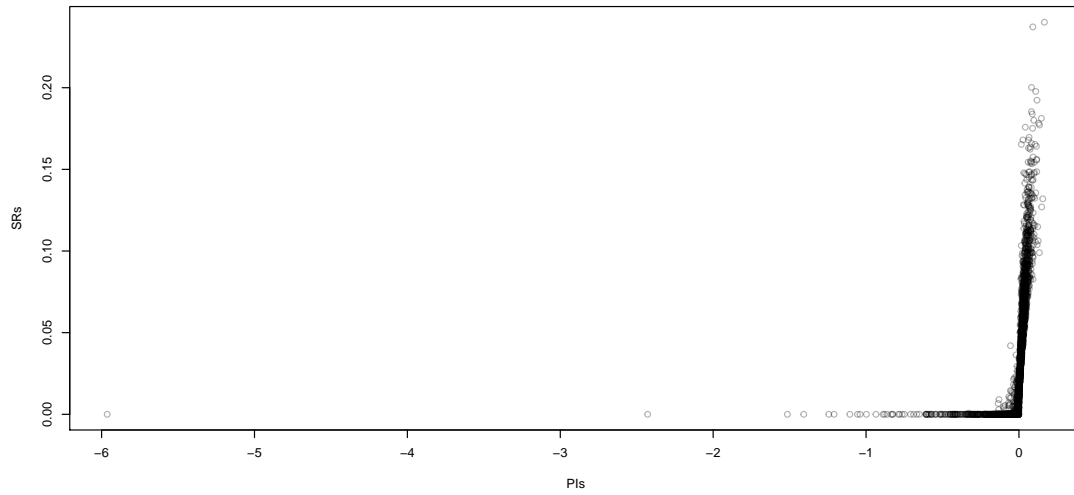
$$CS_SD_{ret} = \sqrt{\frac{1}{N} \sum_{i=1}^N (avg_ret_i - mean_avg_ret)^2}$$

$$CS_SD_{SD} = \sqrt{\frac{1}{N} \sum_{i=1}^N (SD_ret_i - mean_SD_ret)^2}$$

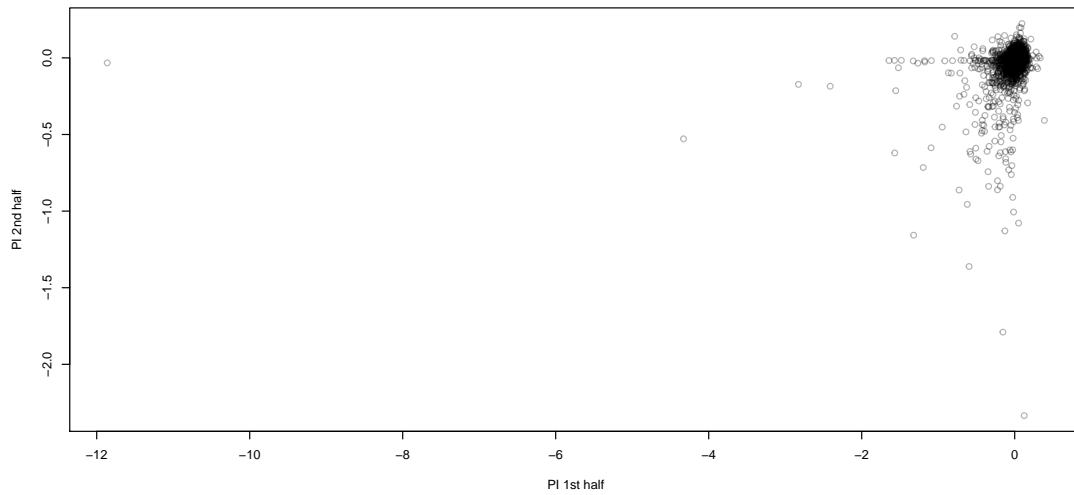
Calculation of lambda

$$\lambda = \frac{CS_SD_{ret}}{CS_SD_{ret} + CS_SD_{SD}}$$

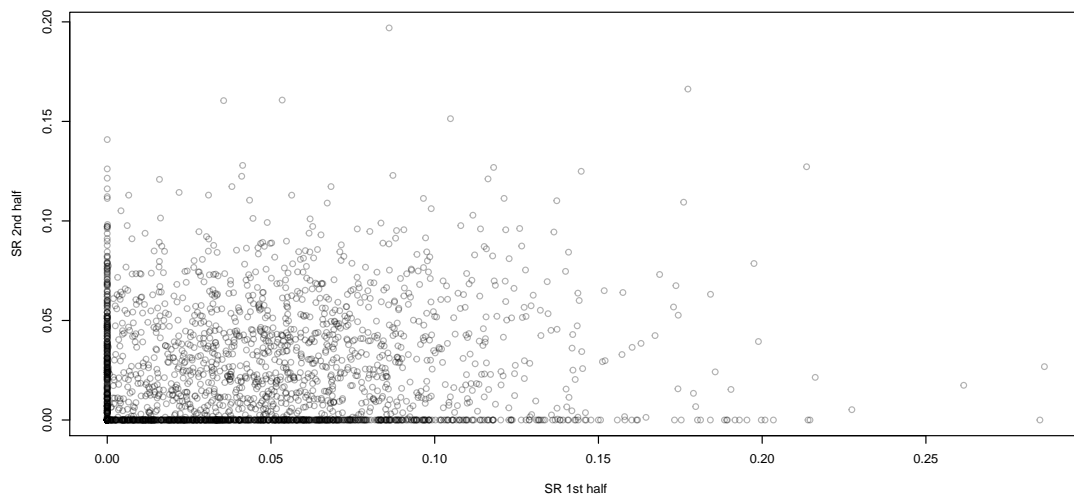
Correlations for lambda: CS
Correlation of PI and SR: 0.344



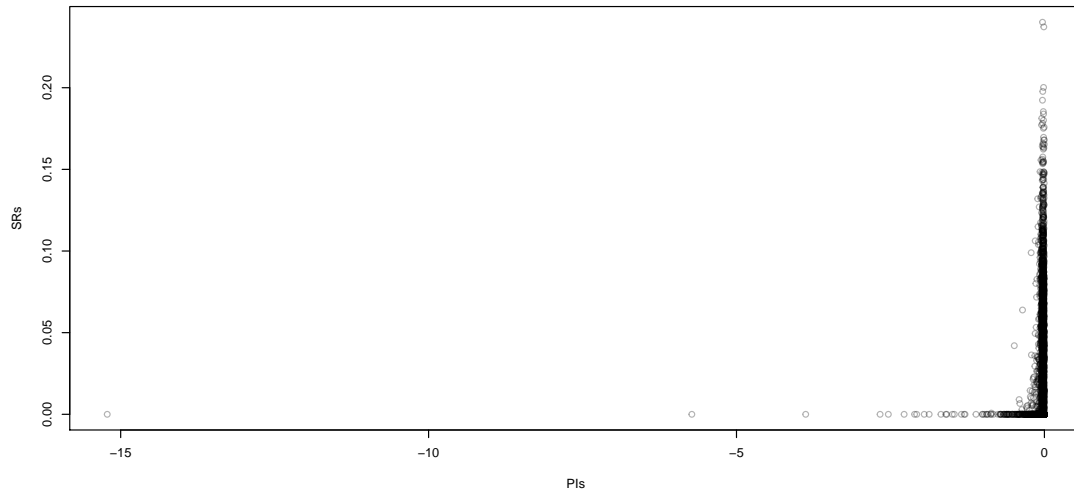
Autocorrelation of PI: 0.212



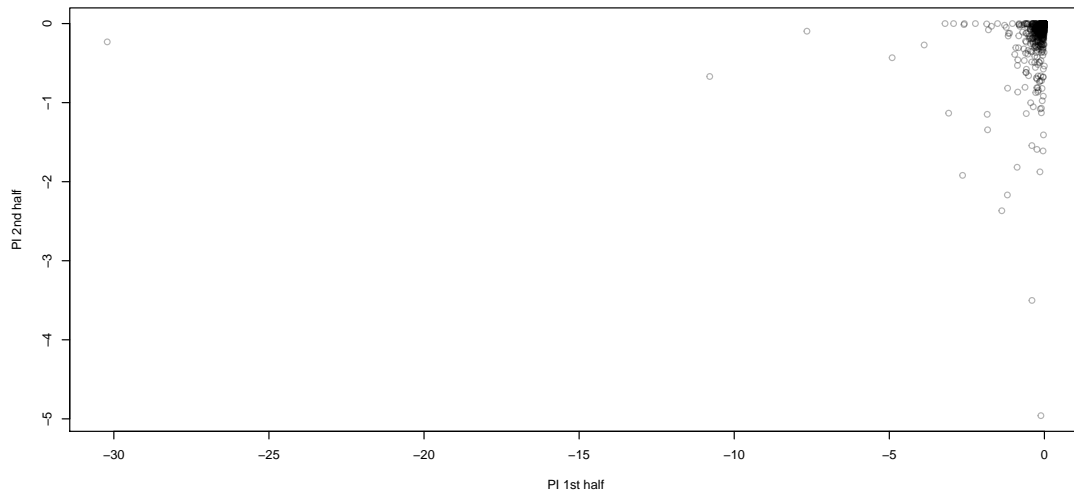
Autocorrelation of Sharpe Ratios: 0.203



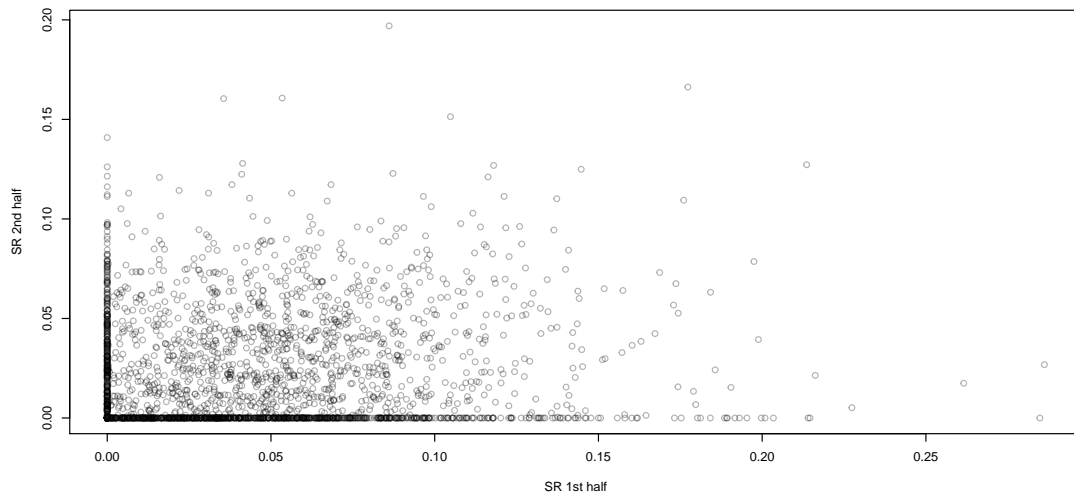
Correlations for lambda: 0
Correlation of PI and SR: 0.106



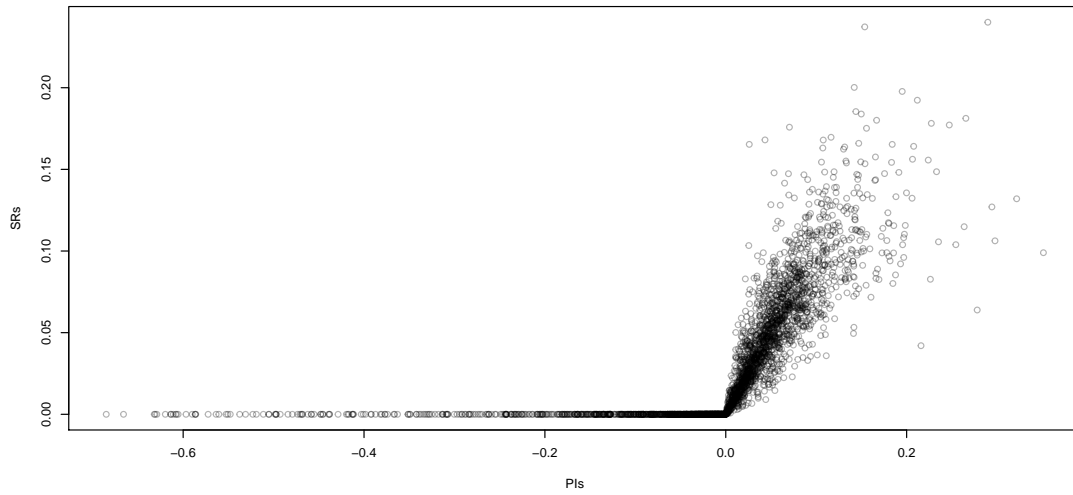
Autocorrelation of PI: 0.144



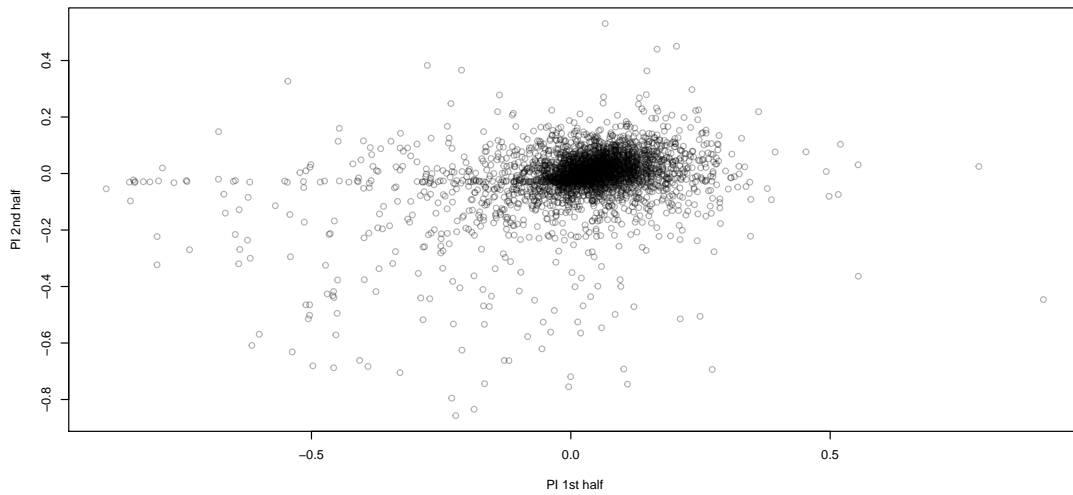
Autocorrelation of Sharpe Ratios: 0.203



Correlations for lambda: 1
Correlation of PI and SR: 0.62



Autocorrelation of PI: 0.298



Autocorrelation of Sharpe Ratios: 0.203

