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

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

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

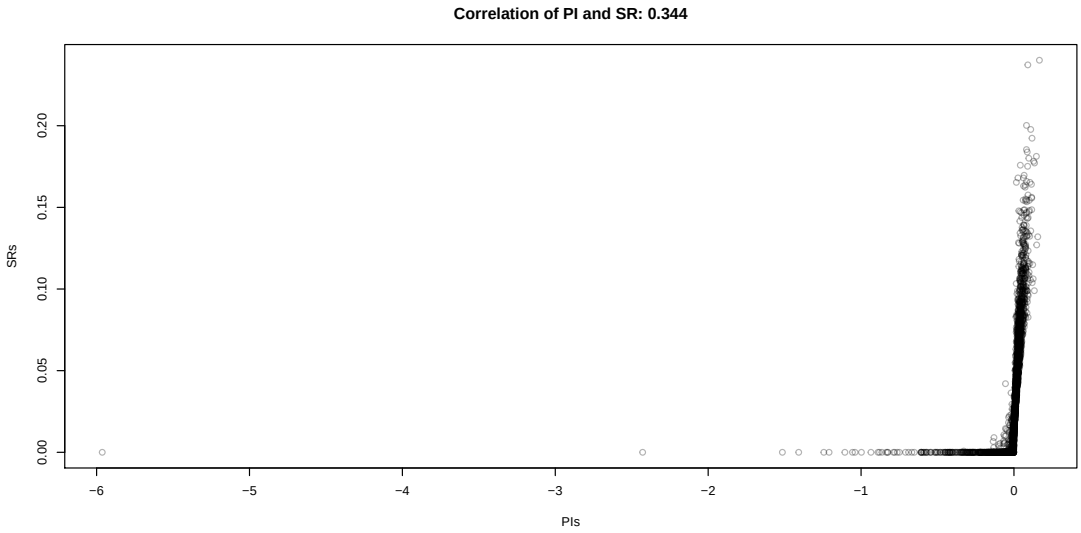
$$CS\_SD_{ret} = \sqrt{\frac{1}{N}\sum_{i=1}^{N}(avg\_ret_i - mean\_avg\_ret)^2}$$

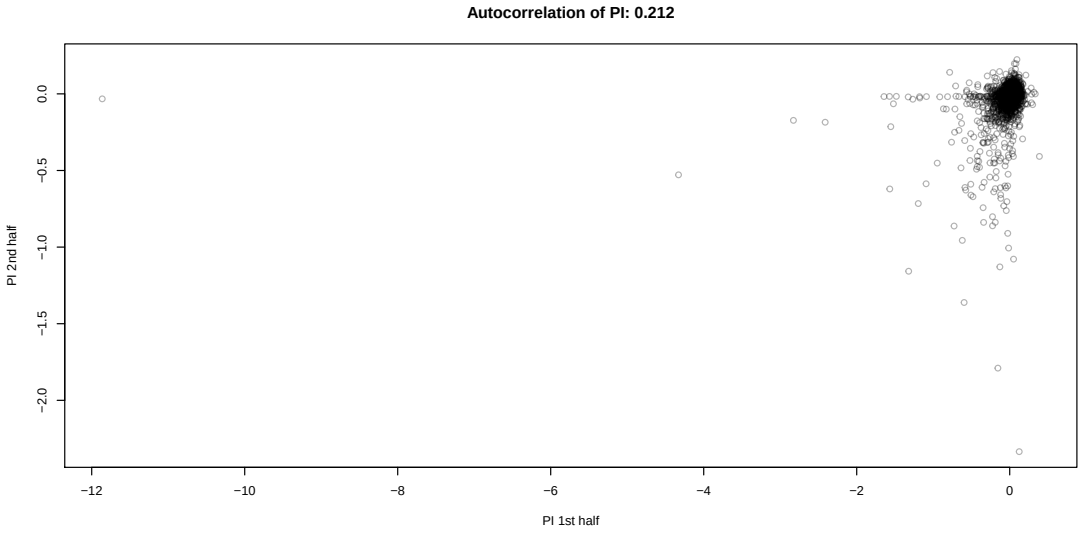
$$CS\_SD_{SD} = \sqrt{\frac{1}{N}\sum_{i=1}^{N}(SD\_ret_i - mean\_SD\_ret)^2}$$

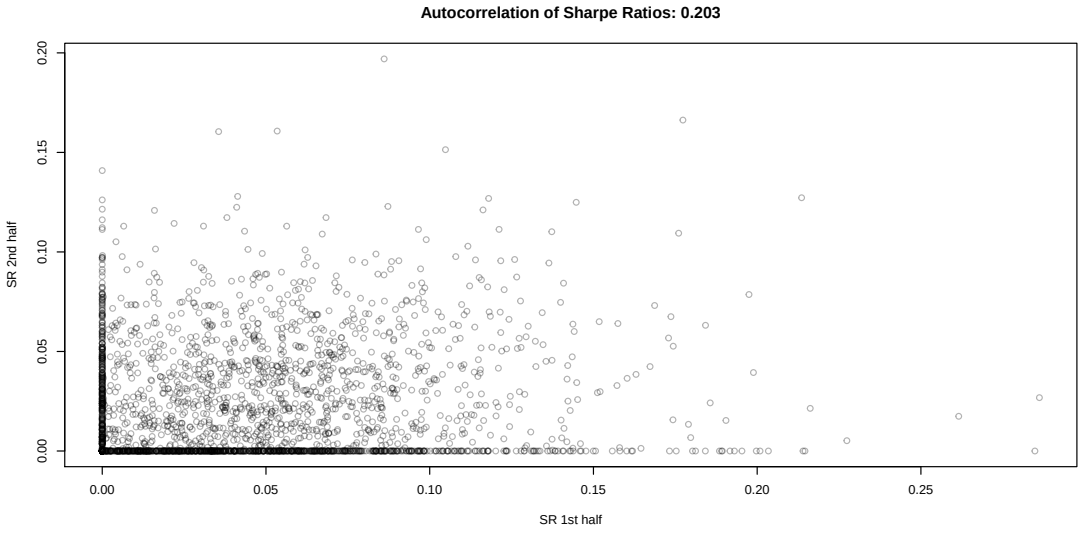
Calculation of lambda

$$\lambda = \frac{CS\_SD_{ret}}{CS\_SD_{ret} + CS\_SD_{SD}}$$

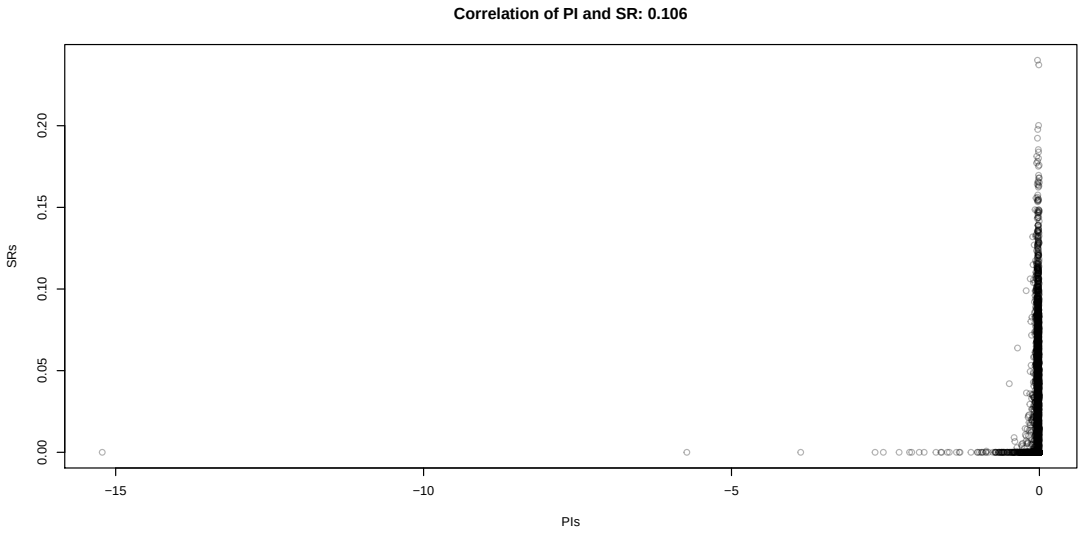
Correlations for lambda: CS

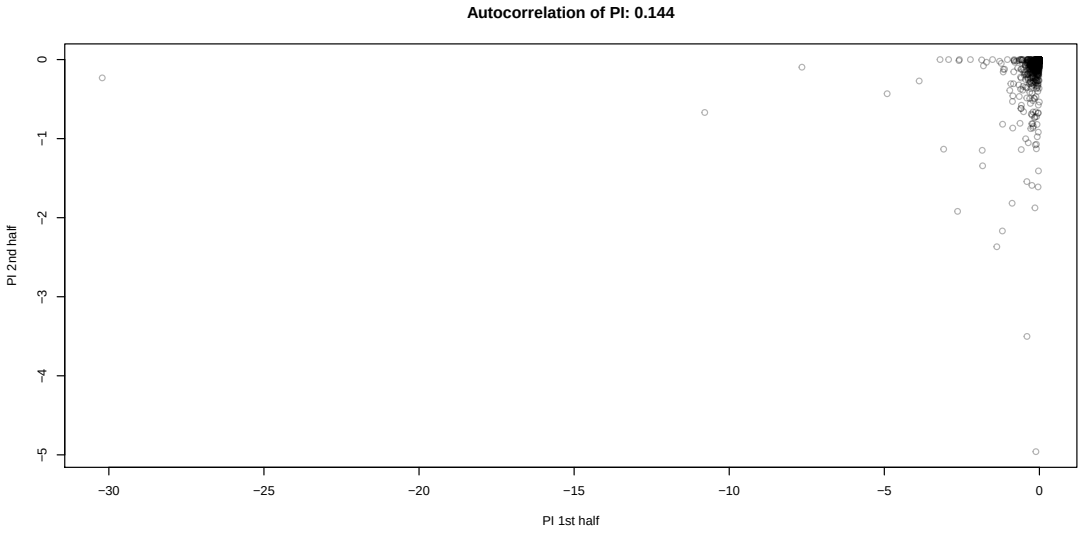


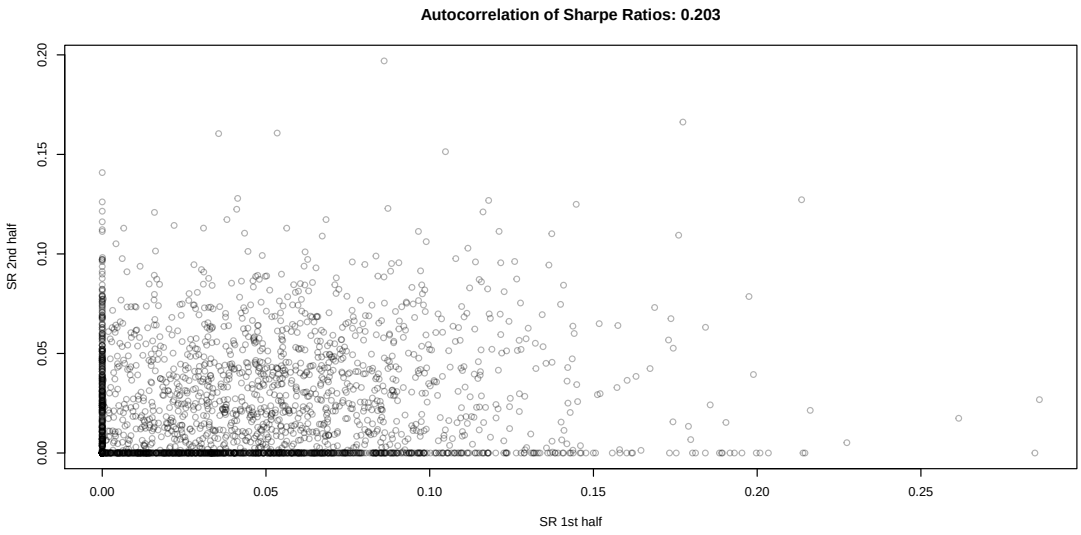




Correlations for lambda: 0







Correlations for lambda: 1