Machine Trading Analysis with R

Section 5: Machine Trading Performance

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Machine Trading Performance

- **Machine trading performance** strategies comparison is done using asset buy and hold strategy as benchmark.
- **Annualized return, annualized standard deviation** and **annualized Sharpe ratio** metrics are used for this assessment.

Performance Metrics

- **Annualized return** is a performance metric that consists of the number of observations root of annually scaled cumulative product of daily returns.

$$r_i = ln\left(\frac{p_i}{p_{i-1}}\right)$$

$$r_a = \left[\prod_{i=1}^{n}(r_i + 1)\right]^{252/n} - 1$$

Performance Metrics

- **Annualized standard deviation** is a risk metric that consists of daily standard deviation multiplied by square root of number of periods per year.

$$\boldsymbol{\sigma_a = \sigma * \sqrt{252}}$$

$$\sigma = \sqrt{\frac{1}{n} * \sum_{i=1}^{n} (r_i - \mu)^2}$$

$$\mu = \frac{\sum_{i=1}^{n} r_i}{n}$$

Performance Metrics

- **Annualized Sharpe ratio** is a risk-adjusted performance metric that consists of annualized excess return by unit of risk.
- William F. Sharpe. "The Sharpe Ratio". *Journal of Portfolio Management*. 1994.

$$sr_a = \frac{r_a - rf_a}{\sigma_a}$$