Returns & Volatility

Computing log returns and annualized volatility

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2026-01-11

Abstract

This note computes **log returns**, annualized **volatility**, and visualizes the distribution for a liquid asset.

Definitions

Given a price series P_t, the **log return** is:

$$r_t = \ln\left(\frac{P_t}{P_{t-1}}\right)$$

Annualized volatility (assuming 252 trading days):

$$\sigma_{\text{ann}} = \sqrt{252} \cdot \text{std}(r_t)$$

Compute (Python)

	ticker	period	mu_daily	mu_ann	sigma_daily	sigma_ann	n_obs
0	SPY	2y	0.000809	0.20377	0.010231	0.162407	502

Distribution