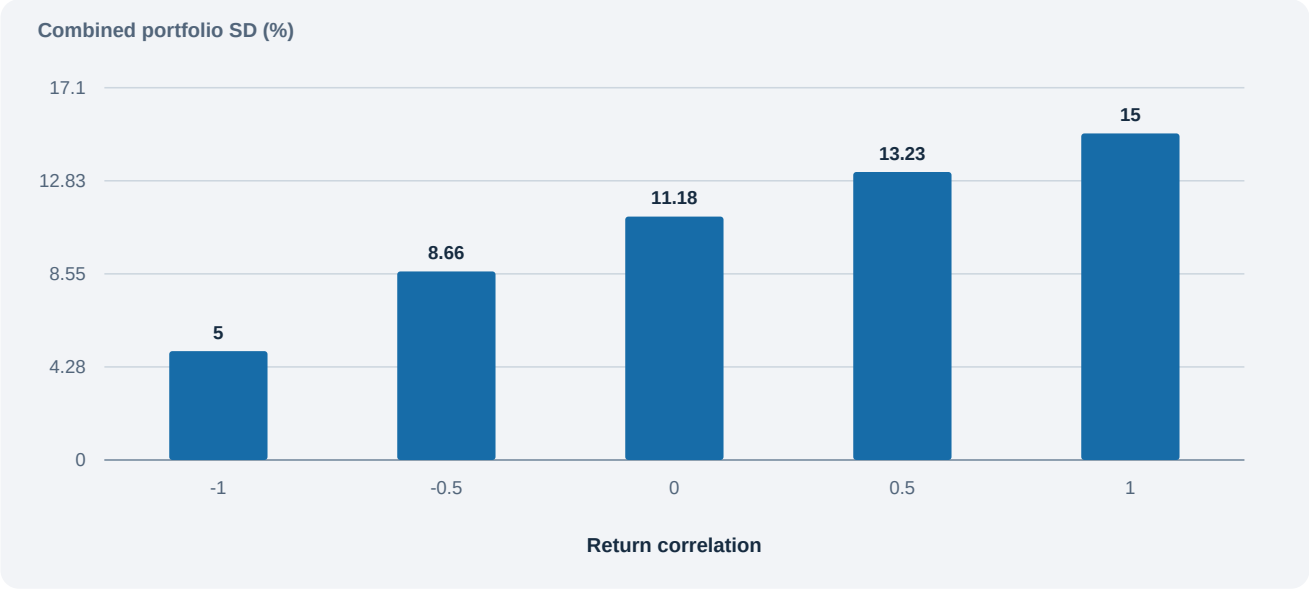
Two-asset portfolio variance

Portfolio arithmetic | Original synthetic example | Edition 2026-11-26

The variance of two weighted assets includes their individual variances and a covariance term. Correlation affects the combination even when each asset's standalone volatility is unchanged.

FORMULA Variance = w1^2 SD1^2 + w2^2 SD2^2 + 2 w1 w2 SD1 SD2 correlation

SCENARIO 01: Equal weights; SDs 10% and 20% on the same horizon



WORKED EXAMPLE

At zero correlation, combined SD is 11.18%. The plotted SD is the square root of portfolio variance.

COMMON MISTAKE

Adding weighted volatilities directly generally omits the covariance structure.

BEFORE YOU USE THE CALCULATION

1. Use consistent return periods.
2. Keep correlation within minus one to one.
3. Distinguish estimated inputs from stable future quantities.

COMPARE TWO MORE INPUT SETS

Scenario 05: Equal weights; SDs 14% and 24% on the same horizon. At zero correlation, combined SD is 13.89%. The plotted SD is the square root of portfolio variance.

Scenario 10: Equal weights; SDs 19% and 29% on the same horizon. At zero correlation, combined SD is 17.33%. The plotted SD is the square root of portfolio variance.

Synthetic values are not historical market data. Educational material; trading can result in substantial losses.