

Risk Measurement: Weight Overlap

[Nematrian website page: [RiskMeasurementWeightOverlap](#), © Nematrian 2015]

A portfolio's *weight overlap* (with a benchmark) is a non-risk model specific measure of the extent to which holding weights in a portfolio coincide with those in a benchmark.

Suppose that the value of the portfolio is V_P and the value of an individual security i in the portfolio is V_i . Then its weight in the portfolio is given by:

$$w_{i,P} = \frac{V_i}{V_P}$$

The corresponding weight in the benchmark is $w_{i,B}$ say.

Occasionally, the portfolio and/or benchmark can be unfunded, in which case these weights are not well-defined. In such circumstances there must be some positions with positive value and some with negative value (if the portfolio is not trivially to equal zero). We might then calculate, say, the gross portfolio value as follows, and express values by reference to it instead.

$$G_P = \sum |V_i|$$

The security's active weight is $a_i = w_{i,P} - w_{i,B}$ (or more generally $a_{i,P,B} = w_{i,P} - w_{i,B}$ if there are several possible portfolios and benchmarks under consideration. The active weights satisfy $\sum a_i = 0$).

The **weight overlap**, WO , then measures the proportion of the value between two portfolios that is identical, calculated as follows (where the summation covers all securities which appear in both P and B):

$$WO(P, B) = \sum \min(|w_{i,P}|, |w_{i,B}|)$$

See also the [MnWeightOverlap](#) web function.