

---

## TREYNOR-BLACK MEASURE

---

### Description of the Measure:

The Treynor-Black Measure is a relative measure of performance. It is given by the annualized excess return of the fund, i.e. the return of the fund deducted the yield of an investment without risk, minus the return of the benchmark multiplied by the fund's beta, divided by the fund's beta. In other words, it corresponds to the Jensen's alpha divided the fund's beta.

### Interpretation:

The Treynor-Black Measure gives gives the excess return obtained when deviating from the benchmark when taking into account the systematic risk of the portfolio. It allows to correct the Jensen's alpha in the sense that it is a relative performance measure.

The magnitude of the Treynor-Black Measure depends on two key variables: the return of the benchmark and the beta. This indicator represents the part of the mean return of the fund that cannot be explained by the systematic risk exposure to market variations, by unit of systematic risk.

### Use:

The magnitude of the Ferson-Schadt Measure depends on two variables: the return of the fund and risk sensitivities variability. This indicator represents the part of the mean return of the fund that cannot be explained by common factorial risk exposure (supposing, this time, that the market risk sensitivity is modified through the sample). It is a function of how good were the anticipations of the manager concerning market factor evolutions.

### Potential Misuse:

The validity of this measure depends crucially on the hypothesis that the beta of the fund is stationary, i.e. that the manager of the fund does not adapt his/her portfolio's weight according to his/her expectation on the future market variations. The validity of this hypothesis has to be tested before focusing on the value of this indicator.

### Formula:

$$TB_{p,t} = \frac{[E_t(R_{p,t}) - R_f] - \hat{\beta}_p [E_t(R_{m,t}) - R_f]}{\hat{\beta}_p}$$

where:

$E_t(R_{p,t})$  is the annualized mean return on the fund considered over period;

$R_f$  is a proxy for the riskless rate;

$E_t(R_{m,t})$  is the annualized mean return on the market portfolio considered over period;

$\hat{\beta}_p$  is the estimated sensitivity of the fund return to the market portfolio variations;

Two year data of weekly series is considered.

### References:

Treynor J. and F. Black, (1972), "Portfolio Selection Using Special Information, under the Assumptions of the Diagonal Model, with Mean-Variance Portfolio Objectives, and without Constraints", in Mathematical Methods in Investment and Finance, Szegö and Shell Ed., North Holland, 1972, 367-383.