Package 'sharpeRratio'

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Type Package

Title Moment-Free Estimation of Sharpe Ratios

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Author Damien Challet

Maintainer Damien Challet <damien.challet@gmail.com>

Description An efficient moment-free estimator of the Sharpe ratio, or signal-to-noise ratio, for heavy-tailed data (see <https://arxiv.org/abs/1505.01333>).

License GPL (>= 2)

Depends ghyp

Imports Rcpp (>= 0.12.4)

LinkingTo Rcpp

NeedsCompilation yes

Repository CRAN

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R topics documented:

sharpeRratio-package *A moment-free estimator of the Sharpe (signal-to-noise) ratio*

Description

This package implements a new estimator of Sharpe ratios that does not rely on the computation of any moment, despite the fact that its usual definition involves at least the first two moments (average and standard deviation).

Details

An implementation of an alternative method to measure Sharpe ratios, i.e. signal-to-noise ratios in time series with heavy-tailed increments. The method itself does not require the computation of any moment as it is based on counting the number of records of the cumulative sum of the increments. When increments are known to be Gaussian, the usual estimator has to be used. However, when the increments are heavy-tailed, the new estimator is much more precise (efficient). Note that the increments are assumed to be i.i.d.

Author(s)

Damien Challet Maintainer: Damien Challet

References

D. Challet, Sharper asset ranking from total drawdown durations (2016)

a_vs_R0dN *A pre-calibrated spline function needed to translate the number of upper/lower records in to signa-to-noise ratios.*

Description

This function is needed by There should not be any need to use directly this function.

See Also

estimateSNR

`estimateSNR` *A moment-free estimator of the Sharpe (signal-to-noise) ratio*

Description

This function accepts a vector of price returns (or any possibly heavy-tailed data) and returns a list containing the moment-free estimator, the vanilla estimator.

Usage

```
estimateSNR(x,numPerm=1000)
```

Arguments

`x`	a (non-empty) numeric vector of data values.
`numPerm`	The basic assumption of the estimator is that the sample data are independent and indentically distributed. To improve the efficiency (precision) of the test, it is a good idea to average it over several random index permutations. Y ou can use the default value.

Details

The estimator first computes the cumulated sum of x (e.g. prices) and then counts the number of upper records of the price (starting from the first point); an equivalent view point consists in computing the total drawdown duration. For the sake of symmetry, the number of lower records (or total drawup duration) is also computed, and the estimator is simply the difference between the two. Since it is an integer number, and provided that x is independently and identically distributed, the precision of the estimator may be improved by averaging the estimator on several random permutations of x.

Value

`SNR`	The signal-to-noise ratio. To have something comparable with a t-statistics, multiply by sqrt(length(x)).
`R0bar`	The number of upper records minus the number of lower records of the cumulated sum of x.
`N`	The length of the vector x. It may be smaller than the input length if x contains NAs.

Author(s)

Damien Challet

References

Challet, D. 2016 Sharper Asset Ranking with Total Drawdown Durations

Examples

```
x <- rt(100,3)+0.05  #some Student-t distributed synthetic price log-returns
estimateSNR(x)
```

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