Package ‘RPEIF’

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IF returns the data and plots the shape of either the IF or the IF TS for a specified estimator.

Usage

IF(
    estimator,
    returns = NULL,
    evalShape = FALSE,
    retVals = NULL,
    nuisPars = NULL,
    k = 4,
    IFplot = FALSE,
    IFprint = TRUE,
    prewhiten = FALSE,
    ar.prewhiten.order = 1,
    cleanOutliers = FALSE,
    cleanMethod = c("locScaleRob")[1],
    family = c("mopt", "opt", "bisquare")[1],
    eff = 0.99,
    ...
)
Arguments

- **estimator**: The estimator of interest.
- **returns**: Returns data of the asset or portfolio. This can be a numeric or an xts object.
- **evalShape**: Evaluation of the shape of the IF risk or performance measure if TRUE. Otherwise, a TS of the IF of the provided returns is computed.
- **retVals**: Values used to evaluate the shape of the IF. (if no returns are provided).
- **nuisPars**: Nuisance parameters used for the evaluation of the shape of the IF. (if no returns are provided).
- **k**: Range parameter for the shape of the IF (the SD gets multiplied k times).
- **IFplot**: If TRUE, the plot of the IF shape or IF TS of the returns is produced.
- **IFprint**: If TRUE, the data for the IF shape or the IF TS of the returns is returned.
- **prewhiten**: Boolean variable to indicate if the IF TS is pre-whitened (TRUE) or not (FALSE).
- **ar.prewhiten.order**: Order of AR parameter for the pre-whitening. Default is AR(1).
- **cleanOutliers**: Boolean variable to indicate whether outliers are cleaned with a robust location and scale estimator.
- **cleanMethod**: Robust method used to clean outliers from the TS. Default choice is "locScaleRob".
- **family**: Family for robust m-estimator of location. Must be one of "mopt" (default), "opt" or "bisquare".
- **eff**: Tuning parameter for the normal distribution efficiency for robust methods.
- **...**: Additional parameters passed on to influence function of risk or performance measure.

Details

For further details on the usage of the nuisPars argument, please refer to Section 3.1 for the RPEIF vignette.

Author(s)

Anthony-Alexander Christidis, <anthony.christidis@stat.ubc.ca>

Examples

```r
# Plot of IF using the wrapper function
outIF <- IF(estimator = "Mean",
            returns = NULL, evalShape = TRUE, retVals = NULL, nuisPars = list(mu = 0.005),
            IFplot = TRUE, IFprint = TRUE)

# Plot of IF using the wrapper function and with a specified TS

# Loading data (hedge funds returns)
data(edhec, package = "PerformanceAnalytics")
colnames(edhec) = c("CA", "CTAG", "DIS", "EM", "EMN", "ED", "FIA",
                   "GM", "LS", "MA", "RV", "SS", "FoF")

# Plot of IF using the wrapper function and with a specified TS
```
outIF <- IF(estimator = "Mean",
            returns = edhec[, "CA"], evalShape = TRUE,
            retVals = seq(-0.1, 0.1, by = 0.001), nuisPars = NULL,
            IFplot = TRUE, IFprint = TRUE)

# Computing the IF of the returns (with prewhitening) with a plot of IF TS
outIF <- IF(estimator = "Mean",
            returns = edhec[, "CA"], evalShape = FALSE, retVals = NULL, nuisPars = NULL,
            IFplot = TRUE, IFprint = TRUE,
            compile = TRUE, prewhiten = FALSE)

---

**IF.DSR**

*Influence Function - Downside Sharpe Ratio*

**Description**

*IF.DSR* returns the data and plots the shape of either the IF or the IF TS for the Downside Sharpe Ratio.

**Usage**

```r
IF.DSR(
  returns = NULL,
  evalShape = FALSE,
  retVals = NULL,
  nuisPars = NULL,
  k = 4,
  IFplot = FALSE,
  IFprint = TRUE,
  rf = 0,
  prewhiten = FALSE,
  ar.prewhiten.order = 1,
  cleanOutliers = FALSE,
  cleanMethod = c("locScaleRob")[1],
  eff = 0.99,
  ...
)
```

**Arguments**

- **returns**: Returns data of the asset or portfolio. This can be a numeric or an xts object.
- **evalShape**: Evaluation of the shape of the IF risk or performance measure if TRUE. Otherwise, a TS of the IF of the provided returns is computed.
- **retVals**: Values used to evaluate the shape of the IF.
- **nuisPars**: Nuisance parameters used for the evaluation of the shape of the IF (if no returns are provided).
Range parameter for the shape of the IF (the SD gets multiplied k times).

If TRUE, the plot of the IF shape or IF TS of the returns is produced.

If TRUE, the data for the IF shape or the IF TS of the returns is returned.

Risk-free interest rate.

Boolean variable to indicate if the IF TS is pre-whitened (TRUE) or not (FALSE).

Order of AR parameter for the pre-whitening. Default is AR(1).

Boolean variable to indicate whether outliers are cleaned with a robust location and scale estimator.

Robust method used to clean outliers from the TS. Default choice is "locScaleRob".

Tuning parameter for the normal distribution efficiency for the "locScaleRob" robust data cleaning.

Addtional parameters.

Details

For further details on the usage of the nuisPars argument, please refer to Section 3.1 for the RPEIF vignette.

Value

Influence function of DSR.

Author(s)

Anthony-Alexander Christidis, <anthony.christidis@stat.ubc.ca>

Examples

# Plot of IF with nuisance parameter with return value
outIF <- IF.DSR(returns = NULL, evalShape = TRUE,
              nuisPars = NULL, IFplot = TRUE, IFprint = TRUE)

data(edhec, package = "PerformanceAnalytics")
colnames(edhec) = c("CA", "CTAG", "DIS", "EM", "EMN", "ED", "FIA",
                "GM", "LS", "MA", "RV", "SS", "FoF")

# Plot of IF a specified TS
outIF <- IF.DSR(returns = edhec[, "CA"], evalShape = TRUE,
              nuisPars = NULL, IFplot = TRUE, IFprint = TRUE)

# Computing the IF of the returns (with prewhitening) with a plot of IF TS
outIF <- IF.DSR(returns = edhec[, "CA"], evalShape = FALSE,
              nuisPars = NULL, IFplot = TRUE, IFprint = TRUE,
              prewhiten = FALSE)
IF.ES returns the data and plots the shape of either the IF or the IF TS for the ES

**Usage**

```r
IF.ES(
  returns = NULL,
  evalShape = FALSE,
  retVals = NULL,
  nuisPars = NULL,
  k = 4,
  IFplot = FALSE,
  IFprint = TRUE,
  alpha.ES = 0.05,
  prewhiten = FALSE,
  ar.prewhiten.order = 1,
  cleanOutliers = FALSE,
  cleanMethod = c("locScaleRob")[1],
  eff = 0.99,
  ...
)
```

**Arguments**

- **returns**: Returns data of the asset or portfolio. This can be a numeric or an xts object.
- **evalShape**: Evaluation of the shape of the IF risk or performance measure if TRUE. Otherwise, a TS of the IF of the provided returns is computed.
- **retVals**: Values used to evaluate the shape of the IF.
- **nuisPars**: Nuisance parameters used for the evaluation of the shape of the IF (if no returns are provided).
- **k**: Range parameter for the shape of the IF (the SD gets multiplied k times).
- **IFplot**: If TRUE, the plot of the IF shape or IF TS of the returns is produced.
- **IFprint**: If TRUE, the data for the IF shape or the IF TS of the returns is returned.
- **alpha.ES**: Tail Probability.
- **prewhiten**: Boolean variable to indicate if the IF TS is pre-whitened (TRUE) or not (FALSE).
- **ar.prewhiten.order**: Order of AR parameter for the pre-whitening. Default is AR(1).
- **cleanOutliers**: Boolean variable to indicate whether outliers are cleaned with a robust location and scale estimator.
- **cleanMethod**: Robust method used to clean outliers from the TS. Default choice is "locScaleRob".
IF.ESratio

Tuning parameter for the normal distribution efficiency for the "locScaleRob" robust data cleaning.

Additional parameters.

Details

For further details on the usage of the nuisPars argument, please refer to Section 3.1 for the RPEIF vignette.

Value

Influence function of the ES.

Author(s)

Anthony-Alexander Christidis, <anthony.christidis@stat.ubc.ca>

Examples

# Plot of IF with nuisance parameter with return value
outIF <- IF.ES(returns = NULL, evalShape = TRUE, retVals = NULL, nuisPars = NULL, IFplot = TRUE, IFprint = TRUE)

data(edhec, package = "PerformanceAnalytics")
colnames(edhec) = c("CA", "CTAG", "DIS", "EM", "EMN", "ED", "FIA", "GM", "LS", "MA", "RV", "SS", "FoF")

# Plot of IF a specified TS
outIF <- IF.ES(returns = edhec[, "CA"], evalShape = TRUE, retVals = seq(-0.1, 0.1, by = 0.001), nuisPars = NULL, IFplot = TRUE, IFprint = TRUE)

# Computing the IF of the returns (with prewhitening) with a plot of IF TS
outIF <- IF.ES(returns = edhec[, "CA"], evalShape = FALSE, retVals = NULL, nuisPars = NULL, IFplot = TRUE, IFprint = TRUE, prewhiten = FALSE)

---

IF.ESratio  |  Influence Function - Expected Shortfall (ES) Ratio

Description

IF.ESratio returns the data and plots the shape of either the IF or the IF TS for the Expected Shortfall Ratio.
Usage

\[
\text{IF.ESratio}( \\
\text{returns} = \text{NULL}, \\
\text{evalShape} = \text{FALSE}, \\
\text{retVals} = \text{NULL}, \\
\text{nuisPars} = \text{NULL}, \\
k = 4, \\
\text{IFplot} = \text{FALSE}, \\
\text{IFprint} = \text{TRUE}, \\
\text{alpha} = 0.1, \\
\text{rf} = 0, \\
\text{prewhiten} = \text{FALSE}, \\
\text{ar.prewhiten.order} = 1, \\
\text{cleanOutliers} = \text{FALSE}, \\
\text{cleanMethod} = \text{c("locScaleRob")}[1], \\
\text{eff} = 0.99, \\
\ldots
\)

Arguments

- \text{returns}: Returns data of the asset or portfolio. This can be a numeric or an xts object.
- \text{evalShape}: Evaluation of the shape of the IF risk or performance measure if \text{TRUE}. Otherwise, a TS of the IF of the provided returns is computed.
- \text{retVals}: Values used to evaluate the shape of the IF.
- \text{nuisPars}: Nuisance parameters used for the evaluation of the shape of the IF (if no returns are provided).
- \text{k}: Range parameter for the shape of the IF (the SD gets multiplied k times).
- \text{IFplot}: If \text{TRUE}, the plot of the IF shape or IF TS of the returns is produced.
- \text{IFprint}: If \text{TRUE}, the data for the IF shape or the IF TS of the returns is returned.
- \text{alpha}: Tail Probability.
- \text{rf}: Risk-free interest rate.
- \text{prewhiten}: Boolean variable to indicate if the IF TS is pre-whitened (\text{TRUE}) or not (\text{FALSE}).
- \text{ar.prewhiten.order}: Order of AR parameter for the pre-whitening. Default is AR(1).
- \text{cleanOutliers}: Boolean variable to indicate whether outliers are cleaned with a robust location and scale estimator.
- \text{cleanMethod}: Robust method used to clean outliers from the TS. Default choice is "locScaleRob".
- \text{eff}: Tuning parameter for the normal distribution efficiency for the "locScaleRob" robust data cleaning.
- \ldots: Additional parameters.

Details

For further details on the usage of the \text{nuisPars} argument, please refer to Section 3.1 for the \text{RPEIF} vignette.
Value

Influence function of ESratio.

Author(s)

Anthony-Alexander Christidis, <anthony.christidis@stat.ubc.ca>

Examples

# Plot of IF with nuisance parameter with return value
outIF <- IF.ESratio(returns = NULL, evalShape = TRUE, 
                    retVals = NULL, nuisPars = NULL, 
                    IFplot = TRUE, IFprint = TRUE)

data(edhec, package = "PerformanceAnalytics")
colnames(edhec) = c("CA", "CTAG", "DIS", "EM","EMN", "ED", "FIA", 
                     "GM", "LS", "MA", "RV", "SS", "FoF")

# Plot of IF a specified TS
outIF <- IF.ESratio(returns = edhec[, "CA"], evalShape = TRUE, 
                    retVals = seq(-0.1, 0.1, by = 0.001), nuisPars = NULL, 
                    IFplot = TRUE, IFprint = TRUE)

# Computing the IF of the returns (with prewhitening) with a plot of IF TS
outIF <- IF.ESratio(returns = edhec[, "CA"], evalShape = FALSE, 
                    retVals = NULL, nuisPars = NULL, 
                    IFplot = TRUE, IFprint = TRUE, 
                    prewhiten = FALSE)

Description

IF.LPM returns the data and plots the shape of either the IF or the IF TS for the LPM

Usage

IF.LPM(
  returns = NULL, 
  evalShape = FALSE, 
  retVals = NULL, 
  nuisPars = NULL, 
  k = 4, 
  IFplot = FALSE, 
  IFprint = TRUE, 
  const = 0,
order = 1,
prewhiten = FALSE,
ar.prewhiten.order = 1,
cleanOutliers = FALSE,
cleanMethod = c("locScaleRob")[1],
eff = 0.99,
...)

Arguments

returns: Returns data of the asset or portfolio. This can be a numeric or an xts object.
evalShape: Evaluation of the shape of the IF risk or performance measure if TRUE. Otherwise, a TS of the IF of the provided returns is computed.
retVals: Values used to evaluate the shape of the IF.
uisPars: Nuisance parameters used for the evaluation of the shape of the IF (if no returns are provided).
k: Range parameter for the shape of the IF (the SD gets multiplied k times).
IFplot: If TRUE, the plot of the IF shape or IF TS of the returns is produced.
IFprint: If TRUE, the data for the IF shape or the IF TS of the returns is returned.
const: Constant threshold.
order: Order of LPM. Can only take values 1 or 2.
prewhiten: Boolean variable to indicate if the IF TS is pre-whitened (TRUE) or not (FALSE).
ar.prewhiten.order: Order of AR parameter for the pre-whitening. Default is AR(1).
cleanOutliers: Boolean variable to indicate whether outliers are cleaned with a robust location and scale estimator.
cleanMethod: Robust method used to clean outliers from the TS. Default choice is "locScaleRob".
eff: Tuning parameter for the normal distribution efficiency for the "locScaleRob" robust data cleaning.
...: Additional parameters.

Details

For further details on the usage of the nuisPars argument, please refer to Section 3.1 for the RPEIF vignette.

Value

Influence function of LPM.

Author(s)

Anthony-Alexander Christidis, <anthony.christidis@stat.ubc.ca>
**Examples**

```r
# Plot of IF with nuisance parameter with return value
outIF <- IF.LPM(returns = NULL, evalShape = TRUE,
                retVals = NULL, nuisPars = NULL,
                IFplot = TRUE, IFprint = TRUE)

data(edhec, package = "PerformanceAnalytics")
colnames(edhec) = c("CA", "CTAG", "DIS", "EM", "EMN", "ED", "FIA",
                    "GM", "LS", "MA", "RV", "SS", "FoF")

# Plot of IF a specified TS
outIF <- IF.LPM(returns = edhec[,"CA"], evalShape = TRUE,
                retVals = seq(-0.1, 0.1, by = 0.001), nuisPars = NULL,
                IFplot = TRUE, IFprint = TRUE)

# Computing the IF of the returns (with prewhitening) with a plot of IF TS
outIF <- IF.LPM(returns = edhec[,"CA"], evalShape = FALSE,
                retVals = NULL, nuisPars = NULL,
                IFplot = TRUE, IFprint = TRUE,
                prewhiten = FALSE)
```

---

**IF.Mean**

*Influence Function - Mean*

**Description**

*IF.Mean* returns the data and plots the shape of either the IF or the IF TS for the mean.

**Usage**

```r
IF.Mean(
  returns = NULL,  # optional
  evalShape = FALSE,  # default
  retVals = NULL,  # optional
  nuisPars = NULL,  # optional
  k = 4,  # default
  IFplot = FALSE,  # default
  IFprint = TRUE,  # default
  prewhiten = FALSE,  # default
  ar.prewhiten.order = 1,  # default
  cleanOutliers = FALSE,  # default
  cleanMethod = c("locScaleRob")[1],  # default
  eff = 0.99,  # default
  ...  # additional arguments
)
```
Arguments

returns  Returns data of the asset or portfolio. This can be a numeric or an xts object.
evalShape  Evaluation of the shape of the IF risk or performance measure if TRUE. Otherwise, a TS of the IF of the provided returns is computed.
retVals  Values used to evaluate the shape of the IF.
nuisPars  Nuisance parameters used for the evaluation of the shape of the IF (if no returns are provided).
k  Range parameter for the shape of the IF (the SD gets multiplied k times).
IFplot  If TRUE, the plot of the IF shape or IF TS of the returns is produced.
IFprint  If TRUE, the data for the IF shape or the IF TS of the returns is returned.
prewhiten  Boolean variable to indicate if the IF TS is pre-whitened (TRUE) or not (FALSE).
ar.prewhiten.order  Order of AR parameter for the pre-whitening. Default is AR(1).
cleanOutliers  Boolean variable to indicate whether outliers are cleaned with a robust location and scale estimator.
cleanMethod  Robust method used to clean outliers from the TS. Default choice is "locScaleRob".
eff  Tuning parameter for the normal distribution efficiency for the "locScaleRob" robust data cleaning.
...

Details

For further details on the usage of the nuisPars argument, please refer to Section 3.1 for the RPEIF vignette.

Value

Influence function for the specified risk or performance measure.

Author(s)

Anthony-Alexander Christidis, <anthony.christidis@stat.ubc.ca>

Examples

# Plot of IF with nuisance parameter with return value
outIF <- IF.Mean(returns = NULL, evalShape = TRUE, retVals = NULL, nuisPars = NULL, IFplot = TRUE, IFprint = TRUE)
data(edhec, package = "PerformanceAnalytics")
colnames(edhec) = c("CA", "CTAG", "DIS", "EM", "EMN", "ED", "FIA", "GM", "LS", "MA", "RV", "SS", "FoF")

# Plot of IF a specified TS
outIF <- IF.Mean(estimator = "mean", returns = edhec[,"CA"], evalShape = TRUE,
IF.OmegaRatio

Description

IF.OmegaRatio returns the data and plots the shape of either the IF or the IF TS for the Omega Ratio.

Usage

IF.OmegaRatio(
  returns = NULL,
  evalShape = FALSE,
  retVals = NULL,
  nuisPars = NULL,
  k = 4,
  IFplot = FALSE,
  IFprint = TRUE,
  const = 0,
  prewhiten = FALSE,
  ar.prewhiten.order = 1,
  cleanOutliers = FALSE,
  cleanMethod = c("locScaleRob")[[1]],
  eff = 0.99,
  ...
)

Arguments

returns  Returns data of the asset or portfolio. This can be a numeric or an xts object.

evalShape  Evaluation of the shape of the IF risk or performance measure if TRUE. Otherwise, a TS of the IF of the provided returns is computed.

retVals  Values used to evaluate the shape of the IF.

nuisPars  Nuisance parameters used for the evaluation of the shape of the IF (if no returns are provided).

k  Range parameter for the shape of the IF (the SD gets multiplied k times).
IF.OmegaRatio

IFplot
If TRUE, the plot of the IF shape or IF TS of the returns is produced.

IFprint
If TRUE, the data for the IF shape or the IF TS of the returns is returned.

const
Constant threshold.

prewhiten
Boolean variable to indicate if the IF TS is pre-whitened (TRUE) or not (FALSE).

ar.prewhiten.order
Order of AR parameter for the pre-whitening. Default is AR(1).

cleanOutliers
Boolean variable to indicate whether outliers are cleaned with a robust location and scale estimator.

cleanMethod
Robust method used to clean outliers from the TS. Default choice is "locScaleRob".

eff
Tuning parameter for the normal distribution efficiency for the "locScaleRob" robust data cleaning.

Additional parameters.

Details
For further details on the usage of the nuisPars argument, please refer to Section 3.1 for the RPEIF vignette.

Value
Influence function of Omega Ratio.

Author(s)
Anthony-Alexander Christidis, <anthony.christidis@stat.ubc.ca>

Examples

# Plot of IF with nuisance parameter with return value
outIF <- IF.OmegaRatio(returns = NULL, evalShape = TRUE, retVals = NULL, nuisPars = NULL, IFplot = TRUE, IFprint = TRUE)

data(edhec, package = "PerformanceAnalytics")
colnames(edhec) = c("CA", "CTAG", "DIS", "EM", "EMN", "ED", "FIA", "GM", "LS", "MA", "RV", "SS", "FoF")

# Plot of IF a specified TS
outIF <- IF.OmegaRatio(returns = edhec[, "CA"], evalShape = TRUE, retVals = seq(-0.1, 0.1, by = 0.001), nuisPars = NULL, IFplot = TRUE, IFprint = TRUE)

# Computing the IF of the returns (with prewhitening) with a plot of IF TS
outIF <- IF.OmegaRatio(returns = edhec[, "CA"], evalShape = FALSE, retVals = NULL, nuisPars = NULL, IFplot = TRUE, IFprint = TRUE, prewhiten = FALSE)
Description

`IF.RachevRatio` returns the data and plots the shape of either the IF or the IF TS for the Rachev Ratio.

Usage

```r
IF.RachevRatio(
  returns = NULL,
  evalShape = FALSE,
  retVals = NULL,
  nuisPars = NULL,
  k = 4,
  IFplot = FALSE,
  IFprint = TRUE,
  alpha = 0.1,
  beta = 0.1,
  prewhiten = FALSE,
  ar.prewhiten.order = 1,
  cleanOutliers = FALSE,
  cleanMethod = c("locScaleRob")[1],
  eff = 0.99,
  ...
)
```

Arguments

- `returns`: Returns data of the asset or portfolio. This can be a numeric or an xts object.
- `evalShape`: Evaluation of the shape of the IF risk or performance measure if TRUE. Otherwise, a TS of the IF of the provided returns is computed.
- `retVals`: Values used to evaluate the shape of the IF.
- `nuisPars`: Nuisance parameters used for the evaluation of the shape of the IF (if no returns are provided).
- `k`: Range parameter for the shape of the IF (the SD gets multiplied k times).
- `IFplot`: If TRUE, the plot of the IF shape or IF TS of the returns is produced.
- `IFprint`: If TRUE, the data for the IF shape or the IF TS of the returns is returned.
- `alpha`: Lower tail probability.
- `beta`: Upper tail probability.
- `prewhiten`: Boolean variable to indicate if the IF TS is pre-whitened (TRUE) or not (FALSE).
- `ar.prewhiten.order`: Order of AR parameter for the pre-whitening. Default is AR(1).
cleanOutliers  Boolean variable to indicate whether outliers are cleaned with a robust location and scale estimator.
cleanMethod  Robust method used to clean outliers from the TS. Default choice is "locScaleRob".
eff  Tuning parameter for the normal distribution efficiency for the "locScaleRob" robust data cleaning.

Additional parameters.

Details
For further details on the usage of the nuisPars argument, please refer to Section 3.1 for the RPEIF vignette.

Value
Influence function of Rachev Ratio.

Author(s)
Anthony-Alexander Christidis, <anthony.christidis@stat.ubc.ca>

Examples

# Plot of IF with nuisance parameter with return value
outIF <- IF.RachevRatio(returns = NULL, evalShape = TRUE,
retVals = NULL, nuisPars = NULL,
IFplot = TRUE, IFprint = TRUE)
data(edhec, package = "PerformanceAnalytics")
colnames(edhec) = c("CA", "CTAG", "DIS", "EM","EMN", "ED", "FIA", "GM", "LS", "MA", "RV", "SS", "FoF")

# Plot of IF a specified TS
outIF <- IF.RachevRatio(returns = edhec[, "CA"], evalShape = TRUE,
retVals = seq(-0.1, 0.1, by = 0.001), nuisPars = NULL,
IFplot = TRUE, IFprint = TRUE)

# Computing the IF of the returns (with prewhitening) with a plot of IF TS
outIF <- IF.RachevRatio(returns = edhec[, "CA"], evalShape = FALSE,
retVals = NULL, nuisPars = NULL,
IFplot = TRUE, IFprint = TRUE,
prefilter = FALSE)
Description

IF.robMean returns the data and plots the shape of either the IF or the IF TS for the M-estimator of Mean.

Usage

```r
IF.robMean(
  returns = NULL,
  family = c("mopt", "opt", "bisquare")[1],
  eff = 0.95,
  evalShape = FALSE,
  retVals = NULL,
  nuisPars = NULL,
  k = 4,
  IFplot = FALSE,
  IFprint = TRUE,
  prewhiten = FALSE,
  ar.prewhiten.order = 1,
  ...
)
```

Arguments

- `returns` Returns data of the asset or portfolio. This can be a numeric or an xts object.
- `family` Family for robust m-estimator of Mean. Must be one of "mopt" (default), "opt" or "bisquare".
- `eff` Tuning parameter for the normal distribution efficiency. Default is 0.99.
- `evalShape` Evaluation of the shape of the IF risk or performance measure if TRUE. Otherwise, a TS of the IF of the provided returns is computed.
- `retVals` Values used to evaluate the shape of the IF.
- `nuisPars` Nuisance parameters used for the evaluation of the shape of the IF (if no returns are provided).
- `k` Range parameter for the shape of the IF (the SD gets multiplied k times).
- `IFplot` If TRUE, the plot of the IF shape or IF TS of the returns is produced.
- `IFprint` If TRUE, the data for the IF shape or the IF TS of the returns is returned.
- `prewhiten` Boolean variable to indicate if the IF TS is pre-whitened (TRUE) or not (FALSE).
- `ar.prewhiten.order` Order of AR parameter for the pre-whitening. Default is AR(1).
- `...` Additional parameters.
Details

For further details on the usage of the nuisPars argument, please refer to Section 3.1 for the RPEIF vignette.

Value

Influence function for M-estimator of Mean

Author(s)

Anthony-Alexander Christidis, <anthony.christidis@stat.ubc.ca>

Examples

data(edhec, package = "PerformanceAnalytics")
colnames(edhec) = c("CA", "CTAG", "DIS", "EM", "EMN", "ED", "FIA", "GM", "LS", "MA", "RV", "SS", "FoF")

# Plot of IF shape
outIF <- IF.robMean(returns = edhec[, "CA"], evalShape = TRUE, retVals = NULL, IFplot = TRUE, IFprint = TRUE)

# Plot of IF a specified TS
outIF <- IF.robMean(returns = edhec[, "CA"], evalShape = TRUE, retVals = seq(-0.1, 0.1, by = 0.001), IFplot = TRUE, IFprint = TRUE)

# Computing the IF of the returns (with prewhitening) with a plot of IF TS
outIF <- IF.robMean(returns = edhec[, "CA"], evalShape = FALSE, retVals = NULL, IFplot = TRUE, IFprint = TRUE, prewhiten = FALSE)

---

**Description**

`IF.SD` returns the data and plots the shape of either the IF or the IF TS for the standard deviation.

**Usage**

```r
IF.SD(
  returns = NULL,
  evalShape = FALSE,
  retVals = NULL,
  nuisPars = NULL,
)```
k = 4,
IFplot = FALSE,
IFprint = TRUE,
pw = FALSE,
ar.pw.order = 1,
cleanOutliers = FALSE,
cleanMethod = c("locScaleRob")[1],
eff = 0.99,
...)

Arguments

returns Vector of the returns of the asset or portfolio.
evalShape Evaluation of the shape of the IF risk or performance measure if TRUE. Otherwise, a TS of the IF of the provided returns is computed.
retVals Values used to evaluate the shape of the IF.
nuisPars Nuisance parameters used for the evaluation of the shape of the IF (if no returns are provided).
k Range parameter for the shape of the IF (the SD gets multiplied k times).
IFplot If TRUE, the plot of the IF shape or IF TS of the returns is produced.
IFprint If TRUE, the data for the IF shape or the IF TS of the returns is returned.
pw Boolean variable to indicate if the IF TS is pre-whitened (TRUE) or not (FALSE).
ar.pw.order Order of AR parameter for the pre-whitening. Default is AR(1).
cleanOutliers Boolean variable to indicate whether outliers are cleaned with a robust location and scale estimator.
cleanMethod Robust method used to clean outliers from the TS. Default choice is "locScaleRob".
eff Tuning parameter for the normal distribution efficiency for the "locScaleRob" robust data cleaning.
... Additional parameters.

Details

For further details on the usage of the nuisPars argument, please refer to Section 3.1 for the RPEIF vignette.

Value

Influence function of the standard deviation.

Author(s)

Anthony-Alexander Christidis, anthony.christidis@stat.ubc.ca
Examples

# Plot of IF with nuisance parameter with return value
outIF <- IF.SD(returns = NULL, evalShape = TRUE, retVals = NULL, nuisPars = NULL,
              IFplot = TRUE, IFprint = TRUE)

data(edhec, package = "PerformanceAnalytics")
colnames(edhec) = c("CA", "CTAG", "DIS", "EM", "EMN", "ED", "FIA",
                     "GM", "LS", "MA", "RV", "SS", "FoF")

# Plot of IF a specified TS
outIF <- IF.SD(returns = edhec[, "CA"], evalShape = TRUE,
               retVals = seq(-0.1, 0.1, by = 0.001), nuisPars = NULL,
               IFplot = TRUE, IFprint = TRUE)

# Computing the IF of the returns (with prewhitening) with a plot of IF TS
outIF <- IF.SD(returns = edhec[, "CA"], evalShape = FALSE,
               retVals = NULL, nuisPars = NULL,
               IFplot = TRUE, IFprint = TRUE,
               prewhiten = FALSE)

---

IF.SemiSD

Influence Function - Semi-Standard Deviation (SemiSD)

Description

IF.SemiSD returns the data and plots the shape of either the IF or the IF TS for the SemiSD

Usage

IF.SemiSD(
  returns = NULL,
  evalShape = FALSE,
  retVals = NULL,
  nuisPars = NULL,
  k = 4,
  IFplot = FALSE,
  IFprint = TRUE,
  prewhiten = FALSE,
  ar.prewhiten.order = 1,
  cleanOutliers = FALSE,
  cleanMethod = c("locScaleRob")[1],
  eff = 0.99,
  ...)
}
Arguments

returns Returns data of the asset or portfolio. This can be a numeric or an xts object.

evalShape Evaluation of the shape of the IF risk or performance measure if TRUE. Otherwise, a TS of the IF of the provided returns is computed.

retVals Values used to evaluate the shape of the IF.

nuisPars Nuisance parameters used for the evaluation of the shape of the IF (if no returns are provided).

k Range parameter for the shape of the IF (the SD gets multiplied k times).

IFplot If TRUE, the plot of the IF shape or IF TS of the returns is produced.

IFprint If TRUE, the data for the IF shape or the IF TS of the returns is returned.

prewhiten Boolean variable to indicate if the IF TS is pre-whitened (TRUE) or not (FALSE).

ar.prewhiten.order Order of AR parameter for the pre-whitening. Default is AR(1).

cleanOutliers Boolean variable to indicate whether outliers are cleaned with a robust location and scale estimator.

cleanMethod Robust method used to clean outliers from the TS. Default choice is "locScaleRob".

eff Tuning parameter for the normal distribution efficiency for the "locScaleRob" robust data cleaning.

... Additional parameters.

Details

For further details on the usage of the nuisPars argument, please refer to Section 3.1 for the RPEIF vignette.

Value

Influence function of SemiSD.

Author(s)

Anthony-Alexander Christidis, <anthony.christidis@stat.ubc.ca>

Examples

# Plot of IF with nuisance parameter with return value
outIF <- IF.SemiSD(returns = NULL, evalShape = TRUE,
                     retVals = NULL, nuisPars = NULL,
                     IFplot = TRUE, IFprint = TRUE)

data(edhec, package = "PerformanceAnalytics")
colnames(edhec) = c("CA", "CTAG", "DIS", "EM", "EMN", "ED", "FIA",
                     "GM", "LS", "MA", "RV", "SS", "FoF")

# Plot of IF a specified TS
outIF <- IF.SemiSD(returns = edhec[,"CA"], evalShape = TRUE,
retVals = seq(-0.1, 0.1, by = 0.001), nuisPars = NULL,
      IFplot = TRUE, IFprint = TRUE)

# Computing the IF of the returns (with prewhitening) with a plot of IF TS
outIF <- IF.SemiSD(returns = edhec[, "CA"], evalShape = FALSE,
       retVals = NULL, nuisPars = NULL,
       IFplot = TRUE, IFprint = TRUE,
       prewhiten = FALSE)

---

IF.SoR  

**Influence Function - Sortino Ratio**

**Description**

IF.SoR returns the data and plots the shape of either the IF or the IF TS for the Sortino Ratio.

**Usage**

```r
IF.SoR(
  returns = NULL,
  evalShape = FALSE,
  retVals = NULL,
  nuisPars = NULL,
  k = 4,
  IFplot = FALSE,
  IFprint = TRUE,
  threshold = c("const", "mean")[1],
  const = 0,
  rf = 0,
  prewhiten = FALSE,
  ar.prewhiten.order = 1,
  cleanOutliers = FALSE,
  cleanMethod = c("locScaleRob")[1],
  eff = 0.99,
  ...
)
```

**Arguments**

- `returns`  
  Returns data of the asset or portfolio. This can be a numeric or an xts object.

- `evalShape`  
  Evaluation of the shape of the IF risk or performance measure if TRUE. Otherwise, a TS of the IF of the provided returns is computed.

- `retVals`  
  Values used to evaluate the shape of the IF.

- `nuisPars`  
  Nuisance parameters used for the evaluation of the shape of the IF (if no returns are provided).

- `k`  
  Range parameter for the shape of the IF (the SD gets multiplied k times).
IFplot
If TRUE, the plot of the IF shape or IF TS of the returns is produced.

IFprint
If TRUE, the data for the IF shape or the IF TS of the returns is returned.

threshold
Parameter of threshold is either "mean" or "const". Default is "mean".

const
The threshold if threshold is "const".

rf
Risk-free interest rate.

prewhiten
Boolean variable to indicate if the IF TS is pre-whitened (TRUE) or not (FALSE).

ar.prewhiten.order
Order of AR parameter for the pre-whitening. Default is AR(1).

cleanOutliers
Boolean variable to indicate whether outliers are cleaned with a robust location and scale estimator.

cleanMethod
Robust method used to clean outliers from the TS. Default choice is "locScaleRob".

eff
Tuning parameter for the normal distribution efficiency for the "locScaleRob" robust data cleaning.

...
Additional parameters.

Details
For further details on the usage of the nuisPars argument, please refer to Section 3.1 for the RPEIF vignette.

Value
Influence function of SoR.

Author(s)
Anthony-Alexander Christidis, <anthony.christidis@stat.ubc.ca>

Examples

```r
# Plot of IF with nuisance parameter with return value
outIF <- IF.SoR(returns = NULL, evalShape = TRUE,
                retVals = NULL, nuisPars = NULL,
                IFplot = TRUE, IFprint = TRUE)

data(edhec, package = "PerformanceAnalytics")
colnames(edhec) = c("CA", "CTAG", "DIS", "EM", "EMN", "ED", "FIA",
                   "GM", "LS", "MA", "RV", "SS", "FoF")

# Plot of IF a specified TS
outIF <- IF.SoR(returns = edhec[,"CA"], evalShape = TRUE,
                retVals = seq(-0.1, 0.1, by = 0.001), nuisPars = NULL,
                IFplot = TRUE, IFprint = TRUE)

# Computing the IF of the returns (with prewhitening) with a plot of IF TS
outIF <- IF.SoR(returns = edhec[,"CA"], evalShape = FALSE,
                retVals = NULL, nuisPars = NULL,
                IFplot = TRUE, IFprint = TRUE,
```
prewhiten = FALSE)

IF.SR  

Description

IF.SR returns the data and plots the shape of either the IF or the IF TS for the SR

Usage

IF.SR(
  returns = NULL,
  evalShape = FALSE,
  retVals = NULL,
  nuisPars = NULL,
  k = 4,
  IFplot = FALSE,
  IFprint = TRUE,
  rf = 0,
  prewhiten = FALSE,
  ar.prewhten.order = 1,
  cleanOutliers = FALSE,
  cleanMethod = c("locScaleRob")[1],
  eff = 0.99,
  ...
)

Arguments

returns  Returns data of the asset or portfolio. This can be a numeric or an xts object.
evalShape  Evaluation of the shape of the IF risk or performance measure if TRUE. Otherwise, a TS of the IF of the provided returns is computed.
retVals  Values used to evaluate the shape of the IF.
nuisPars  Nuisance parameters used for the evaluation of the shape of the IF (if no returns are provided).
k  Range parameter for the shape of the IF (the SD gets multiplied k times).
IFplot  If TRUE, the plot of the IF shape or IF TS of the returns is produced.
IFprint  If TRUE, the data for the IF shape or the IF TS of the returns is returned.
rf  Risk-free interest rate.
prewhten  Boolean variable to indicate if the IF TS is pre-whitened (TRUE) or not (FALSE).
ar.prewhiten.order  Order of AR parameter for the pre-whitening. Default is AR(1).
cleanOutliers  Boolean variable to indicate whether outliers are cleaned with a robust location and scale estimator.

cleanMethod  Robust method used to clean outliers from the TS. Default choice is "locScaleRob".

eff  Tuning parameter for the normal distribution efficiency for the "locScaleRob" robust data cleaning.

... Additional parameters.

Details

For further details on the usage of the nuisPars argument, please refer to Section 3.1 for the RPEIF vignette.

Value

Influence function of the SR.

Author(s)

Anthony-Alexander Christidis, <anthony.christidis@stat.ubc.ca>

Examples

```r
# Plot of IF with nuisance parameter with return value
outIF <- IF.SR(returns = NULL, evalShape = TRUE,
               retVals = NULL, nuisPars = NULL,
               IFplot = TRUE, IFprint = TRUE)

data(edhec, package = "PerformanceAnalytics")
colnames(edhec) = c("CA", "CTAG", "DIS", "EM", "EMN", "ED", "FIA",
                   "GM", "LS", "MA", "RV", "SS", "FoF")

# Plot of IF a specified TS
outIF <- IF.SR(returns = edhec[, "CA"], evalShape = TRUE,
               retVals = seq(-0.1, 0.1, by = 0.001), nuisPars = NULL,
               IFplot = TRUE, IFprint = TRUE)

# Computing the IF of the returns (with prewhitening) with a plot of IF TS
outIF <- IF.SR(returns = edhec[, "CA"], evalShape = FALSE,
               retVals = NULL, nuisPars = NULL,
               IFplot = TRUE, IFprint = TRUE,
               prewhiten = FALSE)
```
**IF.VaR**

*Influence Function - Value at Risk (VaR)*

**Description**

IF.VaR returns the data and plots the shape of either the IF or the IF TS for the Value at Risk

**Usage**

```r
IF.VaR(
  returns = NULL,
  evalShape = FALSE,
  retVals = NULL,
  nuisPars = NULL,
  k = 4,
  IFplot = FALSE,
  IFprint = TRUE,
  alpha = 0.05,
  prewhiten = FALSE,
  ar.prewhiten.order = 1,
  cleanOutliers = FALSE,
  cleanMethod = c("locScaleRob")[1],
  eff = 0.99,
  ...
)
```

**Arguments**

- **returns**
  Returns data of the asset or portfolio. This can be a numeric or an xts object.

- **evalShape**
  Evaluation of the shape of the IF risk or performance measure if TRUE. Otherwise, a TS of the IF of the provided returns is computed.

- **retVals**
  Values used to evaluate the shape of the IF.

- **nuisPars**
  Nuisance parameters used for the evaluation of the shape of the IF (if no returns are provided).

- **k**
  Range parameter for the shape of the IF (the SD gets multiplied k times).

- **IFplot**
  If TRUE, the plot of the IF shape or IF TS of the returns is produced.

- **IFprint**
  If TRUE, the data for the IF shape or the IF TS of the returns is returned.

- **alpha**
  The tail probability of interest.

- **prewhiten**
  Boolean variable to indicate if the IF TS is pre-whitened (TRUE) or not (FALSE).

- **ar.prewhiten.order**
  Order of AR parameter for the pre-whitening. Default is AR(1).

- **cleanOutliers**
  Boolean variable to indicate whether outliers are cleaned with a robust location and scale estimator.

- **cleanMethod**
  Robust method used to clean outliers from the TS. Default choice is "locScaleRob".
IF.VaRratio

Tuning parameter for the normal distribution efficiency for the "locScaleRob" robust data cleaning.

... Additional parameters.

Details

For further details on the usage of the nuisPars argument, please refer to Section 3.1 for the RPEIF vignette.

Value

Influence function of the VaR.

Author(s)

Anthony-Alexander Christidis, <anthony.christidis@stat.ubc.ca>

Examples

# Plot of IF with nuisance parameter with return value
outIF <- IF.VaR(returns = NULL, evalShape = TRUE,
                retVals = NULL, nuisPars = NULL,
                IFplot = TRUE, IFprint = TRUE)

data(edhec, package = "PerformanceAnalytics")
colnames(edhec) = c("CA", "CTAG", "DIS", "EM", "EMN", "ED", "FIA",
                   "GM", "LS", "MA", "RV", "SS", "FoF")

# Plot of IF a specified TS
outIF <- IF.VaR(returns = edhec[, "CA"], evalShape = TRUE,
                retVals = seq(-0.1, 0.1, by = 0.001), nuisPars = NULL,
                IFplot = TRUE, IFprint = TRUE)

# Computing the IF of the returns (with prewhitening) with a plot of IF TS
outIF <- IF.VaR(returns = edhec[, "CA"], evalShape = FALSE,
                retVals = NULL, nuisPars = NULL,
                IFplot = TRUE, IFprint = TRUE,
                prewhiten = FALSE)

---

IF.VaRratio | Influence Function - Value at Risk (VaR) Ratio

Description

IF.VaRratio returns the data and plots the shape of either the IF or the IF TS for the VaR Ratio.
Usage

```r
IF.VaRratio(
  returns = NULL,
  evalShape = FALSE,
  retVals = NULL,
  nuisPars = NULL,
  k = 4,
  IFplot = FALSE,
  IFprint = TRUE,
  alpha = 0.05,
  rf = 0,
  prewhiten = FALSE,
  ar.prewhiten.order = 1,
  cleanOutliers = FALSE,
  cleanMethod = c("locScaleRob")[1],
  eff = 0.99,
  ...
)
```

Arguments

- `returns`: Returns data of the asset or portfolio. This can be a numeric or an xts object.
- `evalShape`: Evaluation of the shape of the IF risk or performance measure if TRUE. Otherwise, a TS of the IF of the provided returns is computed.
- `retVals`: Values used to evaluate the shape of the IF.
- `nuisPars`: Nuisance parameters used for the evaluation of the shape of the IF (if no returns are provided).
- `k`: Range parameter for the shape of the IF (the SD gets multiplied k times).
- `IFplot`: If TRUE, the plot of the IF shape or IF TS of the returns is produced.
- `IFprint`: If TRUE, the data for the IF shape or the IF TS of the returns is returned.
- `alpha`: The tail probability of interest.
- `rf`: Risk-free interest rate.
- `prewhiten`: Boolean variable to indicate if the IF TS is pre-whitened (TRUE) or not (FALSE).
- `ar.prewhiten.order`: Order of AR parameter for the pre-whitening. Default is AR(1).
- `cleanOutliers`: Boolean variable to indicate whether outliers are cleaned with a robust location and scale estimator.
- `cleanMethod`: Robust method used to clean outliers from the TS. Default choice is "locScaleRob".
- `eff`: Tuning parameter for the normal distribution efficiency for the "locScaleRob" robust data cleaning.
- `...`: Additional parameters.

Details

For further details on the usage of the `nuisPars` argument, please refer to Section 3.1 for the RPEIF vignette.
nuiSParSFn

Value
Influence function of the VaRratio.

Author(s)
Anthony-Alexander Christidis, <anthony.christidis@stat.ubc.ca>

Examples

# Plot of IF with nuisance parameter with return value
outIF <- IF.VaRratio(returns = NULL, evalShape = TRUE,
retVals = NULL, nuisPars = NULL,
IFplot = TRUE, IFprint = TRUE)

data(edhec, package = "PerformanceAnalytics")
colnames(edhec) = c("CA", "CTAG", "DIS", "EM", "EMN", "ED", "FIA",
"GM", "LS", "MA", "RV", "SS", "FoF")

# Plot of IF a specified TS
outIF <- IF.VaRratio(returns = edhec[,"CA"], evalShape = TRUE,
retVals = seq(-0.1, 0.1, by = 0.001), nuisPars = NULL,
IFplot = TRUE, IFprint = TRUE)

# Computing the IF of the returns (with prewhitening) with a plot of IF TS
outIF <- IF.VaRratio(returns = edhec[,"CA"], evalShape = FALSE,
retVals = NULL, nuisPars = NULL,
IFplot = TRUE, IFprint = TRUE,
prewhiten = FALSE)

nuisParsFn

Nuisance Parameters Computation

Description
nuis.pars returns the value of the nuisance parameters used in the evaluation of the shape of influence functions for risk and performance measures.

Usage

nuisParsFn(mu = 0.01, sd = 0.05, c = 0, alpha = 0.1, beta = 0.1)

Arguments

mu Mean parameter.
sd Standard deviation parameter.
c Constant value for threshold.
alpha Parameters for the lower tail quantile.
beta Parameter for the upper tail quantile.
Details

For further details on the usage of the `nuisParsFn` function, please refer to Section 3.1 for the RPEIF vignette.

Value

List of nuisance parameters.

Author(s)

Anthony-Alexander Christidis, <anthony.christidis@stat.ubc.ca>

Examples

```r
# Nuisance parameters using default values
defaultNuisance <- nuisParsFn()

# Nuisance parameters using specified values
specifiedNuisance <- nuisParsFn(mu=0.02, sd=0.1, c=0.01, alpha=0.05, beta=0.1)
```
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