

Package ‘haR’

March 1, 2025

Type Package

Title Heterogeneous AutoRegressive (HAR) model

Version 0.1.0

Description

Tools for estimating and forecasting using the Heterogeneous AutoRegressive (HAR) model by Corsi (2009) <[doi:10.1093/jjfinec/nbp001](https://doi.org/10.1093/jjfinec/nbp001)> and the Partial-Variances Heterogeneous AutoRegressive model by Bollerslev et al. (2022) <[doi:10.1016/j.jeconom.2021.04.013](https://doi.org/10.1016/j.jeconom.2021.04.013)>.

Depends R (>= 2.10)

Imports RcppRoll,
stats,
methods

License GPL (>= 3)

Encoding UTF-8

RoxygenNote 7.2.3

URL <https://github.com/daniGiro/harmod>

BugReports <https://github.com/daniGiro/harmod/issues>

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har	<i>Heterogeneous AutoRegressive (HAR) model</i>
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Description

Estimation and forecasting using the HAR model by Corsi (2009) [doi:10.1093/jjfinec/nbp001](https://doi.org/10.1093/jjfinec/nbp001) and the PV-HAR model (Partial-Variances Heterogeneous AutoRegressive model) by Bollerslev et al. (2022) [doi:10.1016/j.jeconom.2021.04.013](https://doi.org/10.1016/j.jeconom.2021.04.013).

Usage

```
har(
  y,
  X,
  lags = c(1, 5, 22),
  fh = 1,
  log = FALSE,
  log_correction = TRUE,
  intercept = TRUE,
  min_correction = FALSE,
  min_constant = 0.5
)
```

Arguments

y	A numeric vector (a realized measure of the integrated volatility).
X	Optionally, a numerical vector or matrix of external regressors, which must have the same number of rows as y.
lags	A numeric vector specifying the lags to be used in the HAR model. Default is <code>c(1, 5, 22)</code> .
fh	A numeric vector specifying the forecast horizons. Usually, 1 denotes daily volatility (no aggregation), 5 weekly volatility, 22 monthly volatility. Default is 1.
log	A logical value indicating whether to apply a logarithmic transformation to the data. Default is FALSE.
log_correction	If TRUE, mean forecasts and fitted values are produced.
intercept	A logical value indicating whether to include an intercept term in the model. Default is TRUE.
min_correction	A logical value indicating whether to apply a minimum correction to negative forecast values. Default is FALSE.
min_constant	A numeric value representing the minimum constant for corrections when <code>min_correction</code> is applied. Default is 0.5.

Value

An S3 object of class `haR` containing various components with information related to the HAR model and its forecasts.

References

- Corsi, F., 2009. A simple approximate long-memory model of realized volatility. *Journal of Financial Econometrics* 7, 174–196. doi:10.1093/jjfinec/nbp001.
- Bollerslev, T., Medeiros, M., Patton, A., Quaedy, R., 2022. From zero to hero: Realized partial (co)variances. *Journal of Econometrics* 231, 348–360. doi:10.1093/jjfinec/nbp001.

Examples

```
x <- rnorm(1000)
obj <- har(x)
```

haR-classS3 Class: haR

Description

The "haR" class represents the output object of the Heterogeneous AutoRegressive (HAR) model created by the `har` function. It contains various components and information related to the HAR model and its forecasts.

Slots

`train` A list containing various components related to the model training and results, including coefficients, fitted values, degrees of freedom, training data, and residuals.

`lags` A numeric vector representing the lags used in the HAR model.

`fh` A numeric vector representing the forecast horizons.

`log` A logical value indicating whether a logarithmic transformation was applied to the data.

`log_correction` A logical value indicating whether a correction was applied when taking the logarithm transformation.

`intercept` A logical value indicating whether an intercept term was included in the model.

`min_correction` A logical value indicating whether a minimum correction was applied to negative forecast values.

`min_constant` A numeric value representing the minimum constant for corrections when `min_correction` is applied.

`call` A record of the function call, capturing the arguments and settings used when creating the HAR model.

`forecasts` A list containing forecasted values.

Examples

```
x <- rnorm(1000)
obj <- har(x)
summary(obj)
#coef(obj)
#print(obj)
#fitted(obj)
#residuals(obj)
#predict(obj)
```

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