Package 'TSF'

January 20, 2025

Type Package

Title Two Stage Forecasting (TSF) for Long Memory Time Series in Presence of Structural Break

Version 0.1.1

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Description Forecasting of long memory time series in presence of structural break by using TSF algorithm by Papailias and Dias (2015) <doi:10.1016/j.ijforecast.2015.01.006>.

License GPL

Imports stats, fracdiff, forecast

LazyData TRUE

NeedsCompilation no

Repository CRAN

Date/Publication 2017-07-15 06:49:07 UTC

Contents

`forecastTSF` *Forecasting fractionally differenced series using TSF approach*

Description

The function is used for forecasting long memory time series using TSF approach

Usage

```
forecastTSF(N0,Xt,bandwidth)
```

Arguments

N0	lead period of forecast
Xt	univariate time series
bandwidth	the bandwidth used in the regression equation

Value

forecastTSF	the predicted values, the out of sample forecasts and the values of long memory parameter

Author(s)

Sandipan Samanta, Ranjit Kumar Paul and Dipankar Mitra

References

Papailias, F. and Dias, G. F. 2015. Forecasting long memory series subject to structural change: A two-stage approach. International Journal of Forecasting, 31, 1056 to 1066.

Wang, C. S. H., Bauwens, L. and Hsiao, C. 2013. Forecasting a long memory process subject to structural breaks. Journal of Econometrics, 177, 171-184.

Reisen, V. A. (1994) Estimation of the fractional difference parameter in the ARFIMA(p,d,q) model using the smoothed periodogram. Journal Time Series Analysis, 15(1), 335 to 350.

Examples

```
## Simulating Long Memory Series
N <- 1000
PHI <- 0.2
THETA <- 0.1
SD <- 1
M <- 0
D <- 0.2
Seed <- 123
N0<-9
bandwidth<-0.9
set.seed(Seed)
Sim.Series <- fracdiff::fracdiff.sim(n = N, ar = c(PHI), ma = c(THETA),
d = D, rand.gen = rnorm, sd = SD, mu = M)

Xt <- as.ts(Sim.Series$series)

## Forecasting using TSF method
forecastTSF (N0,Xt,bandwidth)
```

`StructuralBrekwithLongmemory` *Predicting fractionally differenced series in presence of structural break*

Description

The function is used for prediction of long memory time series in presence of structural break

Usage

```
StructuralBrekwithLongmemory(ts,bandwidth)
```

Arguments

`ts`	univariate time series
`bandwidth`	the bandwidth used in the regression equation

Value

`StructuralBrekwithLongmemory`
the updated series at first step of TSF appraoch, prediction based on TSF approach and the estimate of long memory parameter

Author(s)

Sandipan Samanta, Ranjit Kumar Paul and Dipankar Mitra

References

Papailias, F. and Dias, G. F. 2015. Forecasting long memory series subject to structural change: A two-stage approach. International Journal of Forecasting, 31, 1056 to 1066.

Wang, C. S. H., Bauwens, L. and Hsiao, C. 2013. Forecasting a long memory process subject to structural breaks. Journal of Econometrics, 177, 171-184.

Reisen, V. A. (1994) Estimation of the fractional difference parameter in the ARFIMA(p,d,q) model using the smoothed periodogram. Journal Time Series Analysis, 15(1), 335 to 350.

Examples

```
## Simulating Long Memory Series
N <- 1000
PHI <- 0.2
THETA <- 0.1
SD <- 1
M <- 0
D <- 0.2
Seed <- 123
bandwidth<-0.9
```

```
set.seed(Seed)
Sim.Series <- fracdiff::fracdiff.sim(n = N, ar = c(PHI), ma = c(THETA),
d = D, rand.gen = rnorm, sd = SD, mu = M)

Xt <- as.ts(Sim.Series$series)

## Forecasting using TSF method
StructuralBrekwithLongmemory(Xt,bandwidth)
```

TSF *Fractionally differenced series for any value of d*

Description

The function fdseries computes the fractional differenced series for any value of d i.e. positive or negetive.

Usage

```
fdseries(x, d)
```

Arguments

x	univariate time series
d	The orer of fractional differencing to be done

Value

fdseries	fractionally differenced series for both positive as well as negetive d

Author(s)

Sandipan Samanta, Ranjit Kumar Paul and Dipankar Mitra

References

Papailias, F. and Dias, G. F. 2015. Forecasting long memory series subject to structural change: A two-stage approach. International Journal of Forecasting, 31, 1056 to 1066.

Wang, C. S. H., Bauwens, L. and Hsiao, C. 2013. Forecasting a long memory process subject to structural breaks. Journal of Econometrics, 177, 171-184.

Reisen, V. A. (1994) Estimation of the fractional difference parameter in the ARFIMA(p,d,q) model using the smoothed periodogram. Journal Time Series Analysis, 15(1), 335 to 350.

Examples

```
## Simulating Long Memory Series
N <- 1000
PHI <- 0.2
THETA <- 0.1
SD <- 1
M <- 0
D <- 0.2
Seed <- 123

set.seed(Seed)
Sim.Series <- fracdiff::fracdiff.sim(n = N, ar = c(PHI), ma = c(THETA),
d = D, rand.gen = rnorm, sd = SD, mu = M)

Xt <- as.ts(Sim.Series$series)

## fractional differencing
fdseries(Xt,d=D)
```

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