Package: cthreshER (via r-universe)

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Type Package

Title Continuous Threshold Expectile Regression

Version 1.1.0

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Description Estimation and inference methods for the continuous threshold expectile regression. It can fit the continuous threshold expectile regression and test the existence of change point, for the paper, ``Feipeng Zhang and Qunhua Li (2016). A continuous threshold expectile regression, submitted."

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LazyData TRUE

RoxygenNote 5.0.1

Depends R (>= 3.1.0), Matrix

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NeedsCompilation no

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Repository https://fpzhang2015.r-universe.dev

RemoteUrl https://github.com/cran/cthreshER

RemoteRef HEAD

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Contents

`cterFit` *Fit the continuous threshold expectile regression*

Description

The grid search algorithm for the continuous threshold expectile regression

Usage

```
cterFit(y, x, z, tau = 0.5, max.iter = 100, tol = 1e-04)
```

Arguments

`y`	A vector of response
`x`	A scalar covariate with threshold
`z`	A vector of covariates
`tau`	the expectile level, 0.5 for default
`max.iter`	the maximum iteration steps, 100 for default
`tol`	tolerance value, 1e-4 for default

Value

A list with the elements

`coef.est`	The estimated regression coefficients with intercept.
`threshold.est`	The estimated threshold.
`coef.se`	The estimated standard error of the regression coefficients.
`threshold.se`	The estimated standard error of the threshold.
`iter`	The iteration steps.

Author(s)

Feipeng Zhang and Qunhua Li

Examples

```
## simulated data
ptm <- proc.time()
n <- 200
t0 <- 1.5
bet0 <- c(1, 3, -2, 1)
tau <- 0.3
modtype <- 1
errtype <- 1
dat <- cterSimData(n, bet0, t0, tau, modtype, errtype)
```

```
y <- dat[, 1]
x <- dat[, 2]
z <- dat[, 3]
fit <- cterFit(y, x, z, tau)

## The example of Baseball pitcher salary
data(data_bbsalaries)
y <- data_bbsalaries$y
x <- data_bbsalaries$x
z <- NULL
tau <- 0.5
fit <- cterFit(y, x, z, tau)
proc.time() - ptm
```

`cterSimData` *Simulated data from the continuous threshold expectile regression*

Description

The function for simulating data from the continuous threshold expectile regression

Usage

```
cterSimData(n, bet0, t0, tau = 0.5, modtype = 1, errtype = 1)
```

Arguments

`n`	sample size.
`bet0`	the vecotr of true regression coefficients.
`t0`	the true location of threshold.
`tau`	the expectile level, 0.5 for default.
`modtype`	type of model, 1 = IID for default, 2 = Heteroscedasticity, modtype = 1, $Y = beta_0 + beta_1 X + beta_2 (X - t)_+ gammaZ + e$, modtype = 1, $Y = beta_0 + beta_1 X + beta_2 (X - t)_+ gammaZ + (1 + 0.2Z)e$,
`errtype`	type of error, 1 for default, errtype = 1 for N(0, 1), errtype = 2 for t_4, errtype = 3 for 0.9 N(0, 1) + 0.1 t_4.

Value

A matrix with the elements

`y`	The response variable.
`x`	The scalar covariate with threshold.
`z`	A vector of covariates.

Author(s)

Feipeng Zhang and Qunhua Li

Examples

```
## simulated data
ptm <- proc.time()
n <- 200
t0 <- 1.5
bet0 <- c(1, 3, -2, 1)
tau <- 0.5
modtype <- 1
errtype <- 1
dat <- cterSimData(n, bet0, t0, tau, modtype, errtype)
head(dat)
proc.time() - ptm
```

`cterTest` *test the existence of change point in the continuous threshold expectile regression*

Description

This function for calculating the test statistics and p-value by wild bootstrap.

Usage

```
cterTest(y, x, z, tau = 0.5, NB = 1000)
```

Arguments

`y`	A vector of response
`x`	A scalar covariate with threshold
`z`	A vector of covariates
`tau`	the expectile level, 0.5 for default
`NB`	resampling times, 1000 for default

Value

A list with the elements

`Tn`	The statistic based on original data.
`Tn.NB`	The statistics by wild bootstrap.
`p.value`	The p-value by wild bootstrap.

Author(s)

Feipeng Zhang and Qunhua Li

Examples

```
## simulated data
ptm <- proc.time()
set.seed(1)
n <- 200
t0 <- 1.5
bet0 <- c(1, 3, 0, 1)
tau <- 0.3
modtype <- 1
errtype <- 1
dat <- cterSimData(n, bet0, t0, tau, modtype, errtype)
y <- dat[, 1]
x <- dat[, 2]
z <- dat[, 3]
fit.test <- cterTest(y, x, z, tau, NB = 30)
fit.test$p.value

## The example of Baseball pitcher salary
data(data_bbsalaries)
y <- data_bbsalaries$y
x <- data_bbsalaries$x
z <- NULL
tau <- 0.5
fit.test <- cterTest(y, x, z, tau, NB = 30)
fit.test$p.value
proc.time() - ptm
```

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data_bbsalaries *Baseball pitcher salary data*

Description

Salaries of 176 piters for the 1987 season. The variables are as follows:

Usage

```
data(data_bbsalaries)
```

Format

A data frame with 176 observations on the following 2 variables.

`y` Log of the base salary in dollars

`x` Log of the number of years experience

Source

Hettmansperger, T.P. and McKean J.W. (2011), Robust Nonparametric Statistical Methods, 2nd ed., New York: Chapman-Hall.

References

Hettmansperger, T.P. and McKean J.W. (2011), Robust Nonparametric Statistical Methods, 2nd ed., New York: Chapman-Hall.

Examples

```
data(data_bbsalaries)
## maybe str(data_bbsalaries) ; plot(data_bbsalaries) ...
```

Index