Testing the Overall Covariate Effect At a Single Quantile Level

Description

Testing the Overall Covariate Effect At a Single Quantile Level

Usage

```
QMET.1tau(Y, X, tau, alpha = 0.05, B = 200, dB = 100,
  constant = seq(0.5, 5, 0.05), h = NA)
```

Arguments

`Y`	the nx1 response vector
`X`	the nxp design matrix
`tau`	the quantile level of interest, between 0 and 1
`alpha`	the significance level, defalt is 0.05
`B`	the number of bootstrap samples
`dB`	the number of double bootstrap samples.
`constant`	grid of constants for determining the tuning parameter lambda used in the pre-test
`h`	bandwidth parameter used in the estimation of conditional density. If NA, then h is automatically determined by using the rule from Hall and Sheather (1988).

Value

A list of the following commponents is returned

tn: the observed maximum-type t-statistic

khat: the index of the selected most predictive variable

pval.QMET: the p-value of the QMET based on lambda chosen by double bootstrap

pval.CPB: the p-value of the standard centered percentile bootstrap

pvals: pvalues of the QMET based on fixed lambdas in the grid

resid: residuals from regressing Y on the selected variable

optJ: the index for the selected lambda

Examples

```
#A simulation example
set.seed(12344567)
n=100
p=10
Sigma = matrix(0.5, ncol=p, nrow=p); diag(Sigma)=1
X = mvrnorm(n, mu=rep(0,p), Sigma)
X = matrix(pmin(2, pmax(X, -2)),ncol=p)
epsilon = rnorm(n, 0, 1)
Y = X[,1]/2+epsilon
# Test at a single quantile level (under the null model)
out = QMET.1tau(epsilon, X, tau=0.5, alpha=0.05, B=100, dB=50, constant= seq(0.5, 5, 0.05), h=NA)
out$pval.QMET
out$pval.CPB
out$optJ
#under the alternative model
out = QMET.1tau(Y, X, tau=0.5, alpha=0.05, B=100, dB=50, constant= seq(0.5, 5, 0.05), h=NA)
```

```
out$pval.QMET
out$pval.CPB
out$optJ
```

Testing the Overall Covariate Effect Across Multiple Quantiles

Description

Testing the Overall Covariate Effect Across Multiple Quantiles

Usage

```
QMET.mtau(Y, X, taus, alpha = 0.05, B = 200, dB = 100,
  constant = seq(0.5, 5, 0.05), h = NA)
```

Arguments

`Y`	the nx1 response vector
`X`	the nxp design matrix
`taus`	a m-dimensional vector of quantile levels between 0 and 1
`alpha`	the significance level, defalt is 0.05
`B`	the number of bootstrap samples
`dB`	the number of double bootstrap samples.
`constant`	grid of constants for determining the tuning parameter lambda used in the pre-test
`h`	bandwidth parameter used in the estimation of conditional density. If NA, then h is automatically determined by using the rule from Hall and Sheather (1988).

Value

A list of the following commponents is returned

Tn: the observed test statistic

tn: the observed maximum-type t-statistics at m quantiles

khat: the indices of the selected most predictive variables at m quantiles

pval.QMET: the p-value of the QMET based on lambda chosen by double bootstrap

pval.CPB: the p-value of the standard centered percentile bootstrap

pvals: pvalues of the QMET based on fixed lambdas in the grid

resid: residuals from regressing Y on the selected variable

optJ: the index for the selected lambda

Examples

```
#A simulation example
set.seed(12344567)
n=100
p=10
Sigma = matrix(0.5, ncol=p, nrow=p); diag(Sigma)=1
X = mvrnorm(n, mu=rep(0,p), Sigma)
X = matrix(pmin(2, pmax(X, -2)),ncol=p)
epsilon = rnorm(n, 0, 1)
Y = X[,1]/2+epsilon
# Test across three quartiles (under the null model)
out = QMET.mtau(epsilon, X, taus=c(0.25, 0.5, 0.75), alpha=0.05, B=100, dB=50, constant= seq(0.5, 5, 0.05), h=NA)
out$pval.QMET
out$pval.CPB
out$optJ
#under the alternative model
out = QMET.mtau(Y, X, taus=c(0.25, 0.5, 0.75), alpha=0.05, B=100, dB=50, constant= seq(0.5, 5, 0.05), h=NA)
out$pval.QMET
out$pval.CPB
out$optJ
```