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, default 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 components 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(1234567)
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.CFB
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, default 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 components 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

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