

# Package ‘evar’

September 6, 2020

**Type** Package  
**Title** Estimating and Testing for (Hight-dimensional) Expectile Regression Models  
**Version** 1.0.1  
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**Description** Estimating for Expectile Regression Models and Testing for High-dimensional Expectile Regression Models  
**License** GPL (>= 2)  
**Depends** R (>= 3.2.0)  
**LazyData** true  
**NeedsCompilation** yes  
**Repository** CRAN  
**URL** <https://github.com/xliusufe/evar>  
**Encoding** UTF-8

## R topics documented:

evar-package	1
evar.est	2
evar.test	3
<b>Index</b>	<b>5</b>

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evar-package	<i>Estimating and Testing for (Hight-dimensional) Expectile Regression Models</i>
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**Description**

Estimating for Expectile Regression Models and Testing for High-dimensional Expectile Regression Models

**Details**

Package: evar  
 Type: Package  
 Version: 1.0.1  
 Date: 2020-09-7  
 License: GPL ( $\geq 2$ )

## References

Tan, X. and Liu, X. (2020). Testing value at risk in ultra-high dimensional expectile models. Manuscript.

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evar.est

*Estimating the coefficients for the expectile regression models*

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## Description

Estimating the coefficients for the expectile regression models

## Usage

```
evar.est(y,x=NULL,tau=0.5,eps=1e-6,max_step=100)
```

## Arguments

y	Response vector in $R^n$ .
x	Numeric design matrix for the model in $R^{n \times p}$ .
tau	The $\tau^{th}$ expectile, a scalar with the value in $(0, 1)$ . Default is tau = 0.5.
eps	Convergence threshold. The algorithm iterates until the relative change in any coefficient is less than eps. Default is eps = 1e-6.
max_step	Maximum number of iterations. Default is max_step = 100.

## Value

beta	Estimator of the coefficientss corresponding to the first $q$ covariates.
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## References

Tan, X. and Liu, X. (2020). Testing value at risk in ultra-high dimensional expectile models. Manuscript.

**Examples**

```

tau <- 0.4
n  <- 150
p  <- 5

beta <- c(1, 2, -1, -2, 3)
set.seed(2)
x <- matrix(rnorm(n*p),n,p)
y <- x%%beta + rnorm(n)

fit <- evar.est(y, x, tau)

```

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evar.test	<i>Testing the coefficients for the high-dimensional expectile regression models</i>
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**Description**

Testing the coefficients as a whole for the high-dimensional expectile regression models

**Usage**

```
evar.test(y,x=NULL,tau=0.5,q=0,eps=1e-6,max_step=100)
```

**Arguments**

y	Response vector in $R^n$ .
x	Numeric design matrix for the model in $R^{n \times p}$ .
tau	The $\tau^{th}$ expectile, a scalar with the value in $(0, 1)$ . Default is tau = 0.5.
q	A nonnegative integer indicating that the first $q$ covariates are not tested. Default is q=0.
eps	Convergence threshold. The algorithm iterates until the relative change in any coefficient is less than eps. Default is eps = 1e-6.
max_step	Maximum number of iterations. Default is max_step = 100.

**Value**

Tn	Value of test statistic.
beta	Estimator of the coefficientss corresponding to the first $q$ covariates.
pval	P-value.

**References**

Tan, X. and Liu, X. (2020). Testing value at risk in ultra-high dimensional expectile models. Manuscript.

**Examples**

```
tau <- 0.4
n   <- 150
p   <- 450
q   <- 3

set.seed(2)
x <- matrix(rnorm(n*p),n,p)
y <- rnorm(n)

fit <- evar.test(y, x, tau, q)
```

# Index

\*Topic **package**

  evar-package, [1](#)

evar-package, [1](#)

evar.est, [2](#)

evar.test, [3](#)