

Package ‘elm’

January 10, 2014

Type Package

Title Exact linear regression

Version 0.1

Date 2013-11-17

Description Provides an implementation of exact tests for the coefficients of a linear regression.

Depends R (>= 2.10.0), stats, Rglpk, quadprog

License GPL-2

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elm-package	<i>Exact linear models</i>
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Description

Implementation of exact test of linear regressions.

Details

Package: elm
Type: Package
Version: 0.1
Date: 2013-11-17
License: GPL-2

~~ An overview of how to use the package, including the most ~~ ~~ important functions ~~

Author(s)

Karl Schlag, Olivier Gossner, Gareth Liu-Evans and Oliver Reiter

References

Olivier Gossner, Karl H. Schlag, "Finite-sample exact tests for linear regressions with bounded dependent variables", Journal of Econometrics, Volume 177, Issue 1, November 2013, Pages 75-84, ISSN 0304-4076, <http://dx.doi.org/10.1016/j.jeconom.2013.06.003>.

See Also

<http://homepage.univie.ac.at/karl.schlag/research/statistics/>

elm

Exact linear models

Description

Uses exact tests for the coefficients of linear regressions.

Usage

```
elm(Y, X, lower = 0, upper = 1,
    alternative = "greater",
    alpha = 0.05,
    coefs = 2,
    nullvalue = 0,
    upperbetabound = 1,
    lambda = 1, lambdamm = 1,
    qq = 0.0001, qqmm = 0.0001,
    iterations = 1000,
    steppc = 0.1,
    silent = FALSE,
    verbose = TRUE,
    na.action = getOption("na.action"))
```

Arguments

Y	dependent variable, as matrix.
X	independent variable, as matrix.
lower, upper	the theoretical lower and upper bounds on the data outcomes known ex-ante before gathering the data.
alternative	the hypothesis to be tested, "less" or "greater" (default).
alpha	the type I error.
coefs	index of the coefficient to be tested
nullvalue	the critical value for the null hypothesis

upperbetabound	the upper bound of beta in the set of the alternative hypothesis. The program tries to find a beta in [nullvalue, upperbetabound] which brings the typeII error to 0.5. If upperbetabound is set to NULL, it will try to guess a usable upperbetabound and slowly increase (steppc controls the increases) it until it finds an optimal beta. This could be, however, computationally expensive.
steppc	Controls the size of the steps taken in finding the optimal beta. The stepwise increase is upperbetabound * steppc. Default is 0.1.
lambda	
lambdamm	
iterations	number of iterations
qq	
qqmm	
silent	Should warnings during the procedure be displayed? Default is FALSE.
verbose	If FALSE, it prints only essential summary of the test. Default is TRUE.
na.action	How to cope with missing values. Uses system-default as default value.

Details

This function computes several exact tests for the coefficient of a linear regression. For an explanation as to how the tests are constructed, please refer to the paper mentioned below.

Author(s)

Karl Schlag, Olivier Gossner, Gareth Liu-Evans and Oliver Reiter

References

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See Also

<http://homepage.univie.ac.at/karl.schlag/research/statistics.html>

Examples

```
## step example
n <- 40
h <- 0.5
Y <- sample(c(0, 1), size = n, replace = TRUE)
X <- cbind(1, runif(n = n) < h)
elm(Y, X, 0, 1, coefs = 2, nullvalue = 0, upperbetabound = NULL)
```

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