Package 'tls'

October 14, 2022

Title Tools of Total Least Squares in Error-in-Variables Models

Version 0.1.0

Date 2018-09-28

Description Functions for point and interval estimation in error-in-variables models via total least squares or generalized total least squares method. See Golub and Van Loan (1980) <doi:10.1137/0717073>, Gleser (1981) <https://www.jstor.org/stable/2240867>, Ivan Markovsky and Huffel (2007) <doi:10.1016/j.sigpro.2007.04.004> for more information.

Depends R (>= 3.2.3)

Imports stats, utils

License GPL (>= 3)

URL https://github.com/LiYanStat/tls

BugReports https://github.com/LiYanStat/tls/issues

Repository CRAN

RoxygenNote 6.0.1

NeedsCompilation no

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Date/Publication 2018-10-06 23:00:03 UTC

R topics documented:

`tls` *Fitting error-in-variables models via total least squares.*

Description

It can be used to carry out regression models that account for measurement errors in the independent variables.

Usage

```
tls(formula, data, method = c("normal", "bootstrap"), conf.level = 0.95,
  ...)
```

Arguments

`formula`	an object of class "formula" (or one that can be coerced to that class): a symbolic description of the model to be fitted.
`data`	an optional data frame, list or environment (or object coercible by as.data.frame to a data frame) containing the variables in the model.
`method`	method for computing confidence interval
`conf.level`	the confidence level for confidence interval.
`...`	Optional arguments for future usage.

Details

This function should be used with care. Confidence interval estimation is given by normal approximation or bootstrap. The normal approximation and bootstrap are proper when all the error terms are independent from normal distribution with zero mean and equal variance (see the references for more details).

Value

`tls` returns parameters of the fitted model including estimations of coefficient, corresponding estimated standard errors and confidence intervals.

Author(s)

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References

- Gleser, Estimation in a Multivariate "Errors in Variables" Regression Model: Large Sample Results, 1981, Ann. Stat.
- Golub and Laon, An Analysis of the Total Least Squares Problem, 1980, SIAM J. Numer. Anal.
- Pesta, Total least squares and bootstrapping with applications in calibration, 2012, Statistics.

Examples

```
library(tls)
set.seed(100)
X.1 <- sqrt(1:100)
X.tilde.1 <- rnorm(100) + X.1
X.2 <- sample(X.1, size = length(X.1), replace = FALSE)
X.tilde.2 <- rnorm(100) + X.2
Y <- rnorm(100) + X.1 + X.2
data <- data.frame(Y = Y, X.1 = X.tilde.1, X.2 = X.tilde.2)
tls(Y ~ X.1 + X.2 - 1, data = data)
```

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