Package ‘dfadjust’

February 24, 2021

Title Degrees of Freedom Adjustment for Robust Standard Errors

Version 1.0.2

Description Computes small-sample degrees of freedom adjustment for heteroskedasticity robust standard errors, and for clustered standard errors in linear regression. See Imbens and Kolesár (2016) <doi:10.1162/REST_a_00552> for a discussion of these adjustments.

Depends R (>= 3.5.0)

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Encoding UTF-8

LazyData true

Suggests testthat (>= 2.1.0), sandwich, knitr, rmarkdown, spelling, formatR

RoxygenNote 7.1.1

URL https://github.com/kolesarm/Robust-Small-Sample-Standard-Errors

BugReports https://github.com/kolesarm/Robust-Small-Sample-Standard-Errors/issues

Language en-US

VignetteBuilder knitr

NeedsCompilation no

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R topics documented:

  dfadjustSE .................................................... 2

Index 4
dfadjustSE

Standard Errors with adjusted degrees of freedom

Description

Standard Errors with adjusted degrees of freedom

Usage

dfadjustSE(
  model,
  clustervar = NULL,
  ell = NULL,
  IK = TRUE,
  tol = 1e-09,
  rho0 = FALSE
)

Arguments

model  Fitted model returned by the `lm` function
clustervar  Factor variable that defines clusters. If `NULL` (or not supplied), the command computes heteroscedasticity-robust standard errors, rather than cluster-robust standard errors.
ell  A vector of the same length as the dimension of covariates, specifying which linear combination $\ell'\beta$ of coefficients $\beta$ to compute. If `NULL`, compute standard errors for each regressor coefficient.
IK  Only relevant for cluster-robust standard errors. Specifies whether to compute the degrees-of-freedom adjustment using the Imbens-Kolesár (2016) method (if `TRUE`), or the Bell-McCaffrey (2002) method (if `FALSE`).
tol  Numerical tolerance for determining whether an eigenvalue equals zero.
rho0  Impose positive $\rho$ when estimating the Moulton (1986) model when implementing the IK method?

Value

Returns a list with the following components

vcov  Variance-covariance matrix estimator. For independent errors, it corresponds to the HC2 estimator (see MacKinnon and White, 1985 and the reference manual for the sandwich package). For clustered errors, it corresponds to a version the generalization of the HC2 estimator, called LZ2 in Imbens and Kolesár.

coefficients  Matrix of estimated coefficients, along with HC1, and HC2 standard errors. Adjusted standard errors, and effective degrees of freedom. Adjusted standard error is HC2 standard error multiplied by $\frac{qt(0.975, df=dof)/qnorm(0.975)}{\sqrt{\text{effective degrees of freedom}}}$ so that one can construct 95% confidence intervals by adding and subtracting 1.96 times the adjusted standard error.
dfadjustSE

*rho, sig* Estimates of $\rho$ and $\sigma$ of the Moulton (1986) model for the regression errors. Only computed if IK method is used.

**References**


**Examples**

```r
## No clustering:
set.seed(42)
x <- sin(1:100)
y <- rnorm(100)
fm <- lm(y ~ x + I(x^2))
dfadjustSE(fm)

## Clustering, with 5 clusters
clustervar <- as.factor(c(rep(1, 40), rep(1, 20),
                         rep(2, 20), rep(3, 10), rep(4, 10)))
dfadjustSE(fm, clustervar)
```
Index

dfadjustSE, 2