Package 'dfadjust'

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Title Degrees of Freedom Adjustment for Robust Standard Errors

Version 0.1.0

Description Computes small-sample degrees of freedom adjustment for heteroskedasticity robust standard errors, and for clustered standard errors in linear regression.

Depends R (>= 3.5.0)

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Encoding UTF-8

LazyData true

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

Roxygen list(markdown = TRUE)

RoxygenNote 6.1.1

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

R topics documented:

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 β 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 ρ 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 defrees of freedom. Adjusted standard error is HC2 standard error multiplied by qt(0.975,df=dof)/qnorm(0.975) so that one can construct 95 adding and subtracting 1.96 times the adjusted standard error.

rho, sig Estimates of ρ and σ of the Moulton (1986) model for the regression errors. Only computed if IK method is used

References

Robert M. Bell and Daniel F. McCaffrey. Bias reduction in standard errors for linear regression with multi-stage samples. Survey Methodology, 28(2):169–181, 2002.

Guido W. Imbens and Michal Kolesár. Robust standard errors in small samples: Some practical advice. Review of Economics and Statistics, 98(4):701–712, October 2016.

Brent R. Moulton. Random group effects and the precision of regression estimates. Journal of Econometrics, 32(3):385–397, 1986.

Examples

```
## 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)
```

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