Package ‘cmtest’

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**cmtest**  
*Conditional moments test*

**Description**

Conditional moments tests for maximum likelihood estimators consist on adding to the matrix of individual contributions to the score moments conditions and then test the hypothesis that the expected value of the vector of augmented scores is zero. It is particularly convenient for the probit and the tobit model to test for functional form, omitted variables, heteroskedasticity and normality.

**Usage**

```r
cmtest(
  x,
  test = c("normality", "reset", "heterosc", "skewness", "kurtosis"),
  powers = 2:3,
  heter_cov = NULL,
  OPG = FALSE
)
```

```
## S3 method for class 'tobit'
cmtest(
  x,
  test = c("normality", "reset", "heterosc", "skewness", "kurtosis"),
  powers = 2:3,
  heter_cov = NULL,
  OPG = FALSE
)
```

```
## S3 method for class 'tobit1'
cmtest(
  x,
  test = c("normality", "reset", "heterosc", "skewness", "kurtosis"),
  powers = 2:3,
  heter_cov = NULL,
  OPG = FALSE
)
```

```
## S3 method for class 'censReg'
cmtest(
  x,
  test = c("normality", "reset", "heterosc", "skewness", "kurtosis"),
  powers = 2:3,
  heter_cov = NULL,
  OPG = FALSE
)
```
## S3 method for class 'glm'
cmtest(
  x,
  test = c("normality", "reset", "heterosc", "skewness", "kurtosis"),
  powers = 2:3,
  heter_cov = NULL,
  OPG = FALSE
)

### Arguments

- **x**: a fitted model, currently a tobit model either fitted by AER::tobit or censReg::censReg or a probit model fitted by glm with family = binomial(link = 'probit').
- **test**: the kind of test to be performed, either a normality test (or separately a test that the skewness or kurtosis coefficients are 0 and 3), a heteroscedasticity test or a reset test,
- **powers**: the powers of the fitted values that should be used in the reset test,
- **heter_cov**: a one side formula that indicates the covariates that should be used for the heteroscedasticity test (by default all the covariates used in the regression are used),
- **OPG**: a boolean, if FALSE (the default), the analytic derivatives are used, otherwise the outer product of the gradient formula is used

### Value

a list with class 'htest' containing the following components:

- data.name: a character string describing the fitted model
- statistic: the value of the test statistic
- parameter: degrees of freedom
- p.value: the p.value of the test
- method: a character indicating what type of test is performed

### Author(s)

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### References


Examples

# replication of Wells (2003) and Pagan and Vella (1989) using Fair's data
library("AER")
data("Affairs", package = "AER")
z <- tobit(affairs ~ gender + age + yearsmarried + children + religiousness +
education + occupation + rating, data = Affairs)
cmtest(z, test = "normality")
cmtest(z, test = "skewness", OPG = TRUE)
cmtest(z, test = "kurtosis", OPG = TRUE)
cmtest(z, test = "reset", powers = 2, OPG = TRUE)
cmtest(z, test = "reset", powers = 3, OPG = TRUE)
cmtest(z, test = "heterosc", OPG = TRUE, heter_cov = ~ gender)
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