

Package ‘lmtestrob’

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Type Package

Title Outlier Robust Specification Testing

Version 0.1

Date 2023-05-22

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Description Robust test(s) for model diagnostics in regression. The current version contains a robust test for functional specification (linearity). The test is based on the robust bounded-influence test by Heritier and Ronchetti (1994) <[doi:10.1080/01621459.1994.10476822](https://doi.org/10.1080/01621459.1994.10476822)>.

License GPL-2

Imports MASS

Suggests lmtest

NeedsCompilation no

Repository CRAN

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lmtestrob-package *Outlier Robust Specification Testing*

Description

The package contains an outlier robust functional miss-specification test.

Details

Package: lmtestrob
Type: Package
Version: 0.1
Date: 2023-05-22
License: GPL-2

Author(s)

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References

Heritier, S., and Ronchetti, E. (1994) Robust Bounded-Influence Tests in General Parametric Models. *Journal of the American Statistical Association*, 89, p. 897-904.

Zeileis, A., and Hothorn, T. (2002) Diagnostic Checking in Regression Relationships. *R News*, 2, p. 7-10.

See Also

[robftest](#)

print.robftest *Print a robftest Object*

Description

Print an object generated by [robftest](#)

Usage

```
## S3 method for class 'robftest'  
print(x, digits = 4, ...)
```

Arguments

| | |
|--------|--|
| x | object returned from the robfmtest . |
| digits | number of significant digits to be printed. |
| ... | currently not used. |

Value

No return value.

Author(s)

Mikhail Zhelonkin

See Also

[robfmtest](#)

| | |
|-----------|---|
| robfmtest | <i>Robust Functional Specification Test</i> |
|-----------|---|

Description

Outlier robust test for functional miss-specification. It can be used to test linearity. The test is based on the robust Wald-type test by Heritier and Ronchetti (1994).

Usage

```
robfmtest(formula, power = 2:3, type = c("regressor"), data,
          x.weights = c("HAT", "MCD"), testtype = "Wald", ...)
```

Arguments

| | |
|-----------|---|
| formula | a symbolic description of the model to be tested. |
| power | integer(s). A vector of positive integers specifying the powers of the variables that should be tested. The default option tests second and third powers. |
| type | currently, only powers of regressors can be used. |
| data | an optional data frame containing the variables in the model. If not found in data, the variables are taken from <code>environment(formula)</code> , typically the environment from which <code>robfmtest</code> is called. |
| x.weights | a string, indicating how the robustness weights on the covariates should be computed. The default option uses hat-matrix-based weights, second option allows to use robust Mahalanobis distance-based weights, where the Minimum Covariance Determinant is used to estimate location and scatter. |
| testtype | currently, the robust version of Wald test is implemented. |
| ... | currently not used. |

Details

Since the classical tests including `resettest`, `raintest` and `harvtest` implemented in `lmtest` are not resistant to outliers and can become misleading even in the presence of one outlier, we provide a test which is resistant to outliers. The price to pay for robustness is a small loss of power, when the model holds exactly.

Value

A list with class `robfmtest` containing the following components:

| | |
|------------------------|--|
| <code>statistic</code> | the value of the test statistic. |
| <code>dof</code> | the number of degrees of freedom. |
| <code>method</code> | a character string indicating what type of test was performed. |
| <code>p.value</code> | the p-value of the test. |
| <code>data.name</code> | a character string giving the name(s) of the data. |

Author(s)

Mikhail Zhelonkin

References

Heritier, S., and Ronchetti, E. (1994) Robust Bounded-Influence Tests in General Parametric Models. *Journal of the American Statistical Association*, 89, p. 897-904.

Examples

```
set.seed(123)
n <- 50
x = runif(n, -3, 3)
y = rnorm(n)
example.dat <- data.frame(x, y)
robfmtest(y ~ x, data = example.dat)
library(lmtest)
resettest(y ~ x, data = example.dat, type = "fitted")
x[50] <- -3
y[50] <- -10
example.dat <- data.frame(x, y)
robfmtest(y ~ x, data = example.dat)
resettest(y ~ x, data = example.dat, type = "fitted")
```

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