

Package ‘lmtestrob’

July 22, 2025

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

Date/Publication 2023-05-23 08:50:05 UTC

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lmtestrob-package	<i>Outlier Robust Specification Testing</i>
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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

[robfmtest](#)

print.robfmtest	<i>Print a robfmtest Object</i>
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Description

Print an object generated by [robfmtest](#)

Usage

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

Arguments

<code>x</code>	object returned from the robfmtest .
<code>digits</code>	number of significant digits to be printed.
<code>...</code>	currently not used.

Value

No return value.

Author(s)

Mikhail Zhelonkin

See Also

[robfmtest](#)

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

<code>formula</code>	a symbolic description of the model to be tested.
<code>power</code>	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.
<code>type</code>	currently, only powers of regressors can be used.
<code>data</code>	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.
<code>x.weights</code>	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.
<code>testtype</code>	currently, the robust version of Wald test is implemented.
<code>...</code>	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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