

Package ‘testequavar’

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Type Package

Title Bootstrap Tests for Equality of 2, 3, or 4 Population Variances

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Description Tests the hypothesis that variances are homogeneous or not using bootstrap. The procedure uses a variance-based statistic, and is derived from a normal-theory test.

The test equivalently expressed the hypothesis as a function of the log contrasts of the population variances. A box-type acceptance region is constructed to test the hypothesis. See Cahoy (2010) \doi{10.1016/j.csda.2010.04.012}.

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Encoding UTF-8

Imports stats

RoxygenNote 7.2.3

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`equa2vartest`*Bootstrap test for equality of two (2) population variances*

Description

Testing equality of two (2) population variances against the alternative that both variances are not equal.

Usage

```
equa2vartest(x1, x2, a, B)
```

Arguments

<code>x1</code>	first sample vector of data or observations
<code>x2</code>	second sample vector of data or observations
<code>a</code>	significance level alpha
<code>B</code>	number of bootstrap samples. At least 500 is recommended.

Value

list consisting of a non-numeric decision whether to reject the null hypothesis or not, the significance level, the number of bootstrap samples used, and the bootstrap P-value calculated using the Euclidean distance.

References

Cahoy, DO (2010), *A Bootstrap Test For Equality Of Variances*, Computational Statistics & Data Analysis, 54(10), 2306-2316. doi:[10.1016/j.csda.2010.04.012](https://doi.org/10.1016/j.csda.2010.04.012)

Examples

```
x1=sqrt(10)*runif(8, -sqrt(3), sqrt(3) )
x2=sqrt(1)*runif(8, -sqrt(3), sqrt(3) )
equa2vartest(x1,x2,0.05, 1000)
```

```
x1=sqrt(1)*rexp(8)
x2=sqrt(1)*rexp(8)
equa2vartest(x1,x2,0.01, 1000)
```

equa3vartest

*Bootstrap test for equality of three (3) population variances***Description**

Testing equality of three (3) population variances against the alternative that all variances are unequal.

Usage

```
equa3vartest(x1, x2, x3, a, B)
```

Arguments

x1	first sample vector of data or observations
x2	second sample vector of data or observations
x3	third sample vector of data or observations
a	significance level alpha
B	number of bootstrap samples. At least 500 is recommended.

Value

list consisting of a non-numeric decision whether to reject the null hypothesis or not, the significance level, the number of bootstrap samples used, and the bootstrap P-value calculated using the Euclidean distance.

References

Cahoy, DO (2010), *A Bootstrap Test For Equality Of Variances*, Computational Statistics & Data Analysis, 54(10), 2306-2316. doi:[10.1016/j.csda.2010.04.012](https://doi.org/10.1016/j.csda.2010.04.012)

Examples

```
x1=sqrt(10)*runif(10, -sqrt(3), sqrt(3) )
x2=sqrt(1)*runif(10, -sqrt(3), sqrt(3) )
x3=sqrt(1)*runif(10, -sqrt(3), sqrt(3) )
equa3vartest(x1,x2,x3, a=0.05, B=1000)

equa3vartest( rexp(10) ,rexp(10) ,rexp(10) ,  a=0.01, B=1000)
```

equa4vartest

Bootstrap test for equality of four (4) population variances

Description

Testing equality of four (4) population variances against the alternative that all variances are not equal.

Usage

```
equa4vartest(x1, x2, x3, x4, a, B)
```

Arguments

x1	first sample vector of data or observations
x2	second sample vector of data or observations
x3	third sample vector of data or observations
x4	fourth sample vector of data or observations
a	significance level alpha
B	number of bootstrap samples. At least 500 is recommended.

Value

list consisting of a non-numeric decision whether to reject the null hypothesis or not, the significance level, the number of bootstrap samples used, and the bootstrap P-value calculated using the Euclidean distance.

References

Cahoy, DO (2010), *A Bootstrap Test For Equality Of Variances*, Computational Statistics & Data Analysis, 54(10), 2306-2316. doi:[10.1016/j.csda.2010.04.012](https://doi.org/10.1016/j.csda.2010.04.012)

Examples

```
x1=sqrt(10)*runif(10, -sqrt(3), sqrt(3) )
x2=sqrt(1)*runif(10, -sqrt(3), sqrt(3) )
x3=sqrt(1)*runif(10, -sqrt(3), sqrt(3) )
x4=sqrt(1)*runif(10, -sqrt(3), sqrt(3) )
equa4vartest(x1,x2,x3, x4, a=0.05, B=500)
```

```
equa4vartest(rexp(10) ,rexp(10) ,rexp(10) , rexp(10), a=0.01, B=1000)
```

testequavar*testequavar Package*

Description

Tests the hypothesis that 2, 3, or 4 population variances are homogeneous or not using bootstrap.

Details

Reference:

Cahoy (2010) [doi:10.1016/j.csda.2010.04.012](https://doi.org/10.1016/j.csda.2010.04.012)

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