

Package ‘cragg’

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Title Tests for Weak Instruments in R

Version 0.0.1

Description Implements Cragg-Donald (1993) <[doi:10.1017/S0266466600007519](https://doi.org/10.1017/S0266466600007519)> and Stock and Yogo (2005) <[doi:10.1017/CBO9780511614491.006](https://doi.org/10.1017/CBO9780511614491.006)> tests for weak instruments in R.

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Encoding UTF-8

LazyData true

RoxygenNote 7.1.1

Imports expm (>= 0.999)

Suggests testthat (>= 3.0.0), knitr, MASS, rmarkdown

Config/testthat/edition 3

Depends R (>= 2.10)

VignetteBuilder knitr

NeedsCompilation no

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Repository CRAN

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cragg_donald	<i>Calculate the Cragg-Donald statistic for a given model.</i>
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Description

Calculate the Cragg-Donald statistic for a given model.

Usage

```
cragg_donald(X, D, Z, data = data.frame())
```

Arguments

X	(formula). A one-sided formula of control variables.
D	(formula). A one-sided formula of endogenous variables (treatments)
Z	(formula). A one-sided formula of instruments
data	(dataframe). An optional dataframe, list, or environment containing the variables used in the model. As with many of the base R functions, if the variables are not found here, they may be searched for in the environment <code>cragg_donald()</code> was called.

Value

(cd_test) results object of class "cd_test"

Examples

```
#Obtain the Cragg-Donald statistic for a model that instruments
#Sepal Width on Petal Length, Petal Width, and Species, while controlling
#for Sepal.Length (a toy example).
cragg_donald(X=~Sepal.Length, D=~Sepal.Width,
Z=~Petal.Length + Petal.Width + Species, data = iris)
```

stock_yogo_recommender	<i>Recommend a critical value for the Cragg-Donald test given a maximum allowable bias/size distortion</i>
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Description

Recommend a critical value for the Cragg-Donald test given a maximum allowable bias/size distortion

Usage

```
stock_yogo_recommender(K, N, B, size_bias)
```

Arguments

K	(int). The number of instruments.
N	(int). The number of endogenous variables (treatments)
B	One of [.05, .1, .15, .2, .25, .3]. The maximum size of allowable bias relative to the normal OLS or the maximum Wald test size distortion.
size_bias	Either "bias" or "size". Whether to use a critical value based on the maximum allowable bias relative to regular OLS (bias), or maximum Wald test size distortion.

Value

(float) the recommended critical value.

Examples

```
#To recommend a critical value for a test with 2 endogenous variables
#and four instruments based on a 5% maximum allowable bias relative to OLS

stock_yogo_recommender(4,2,.05,"bias")
```

stock_yogo_test	<i>Perform the Stock and Yogo test for weak instruments</i>
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Description

Perform the Stock and Yogo test for weak instruments

Usage

```
stock_yogo_test(X, D, Z, data, B = 0.05, size_bias = "bias")
```

Arguments

X	(formula). A one-sided formula of control variables.
D	(formula). A one-sided formula of endogenous variables (treatments)
Z	(formula). A one-sided formula of instruments
data	(dataframe). An optional dataframe, list, or environment containing the variables used in the model. As with many of the base R functions, if the variables are not found here, they may be searched for in the environment <code>cragg_donald()</code> was called.
B	One of [.05, .1, .15, .2, .25, .3]. The maximum size of allowable bias relative
size_bias	Either "bias" or "size". Whether to use a critical value based on the maximum allowable bias relative to regular OLS (bias), or maximum Wald test size distortion (size).

Value

(sy_test) the results of the stock and yogo test.

Examples

```
#Perform the Stock and Yogo test on a model that instruments  
#Sepal Width on Petal Length, Petal Width, and Species, while controlling  
#for Sepal.Length (a toy example).
```

```
stock_yogo_test(X=~Sepal.Length, D=~Sepal.Width,  
Z=~Petal.Length + Petal.Width + Species,  
size_bias="bias",data = iris)
```

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