Package 'cragg'

October 12, 2022

Title Tests for Weak Instruments in R

Version 0.0.1

Description Implements Cragg-
Donald (1993) <doi:10.1017/S0266466600007519> and Stock and Yogo (2005) <doi:10.1017/CBO9780511614491.006> t
struments in R.

License GPL (>= 3)

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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R topics documented:

`cragg_donald` *Calculate the Cragg-Donald statistic for a given model.*

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 cragg_donald() 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_reccomender` *Recommend a critical value for the Cragg-Donald test given a maximum allowable bias/size distortion*

Description

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

Usage

```
stock_yogo_reccomender(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 reccomend 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_reccomender(4,2,.05,"bias")
```

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stock_yogo_test *Perform the Stock and Yogo test for weak instruments*

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 cragg_donald() 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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