Package 'ndvtest'

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Title Shi's Non Degenerate Vuong Test

Depends R (>= 4.0.0)

Imports Rdpack, sandwich, nonnest2, CompQuadForm

Suggests knitr, pscl, MASS, AER, lmtest, mlogit, modelsummary,
    bookdown, ggplot2

Description The Vuong test <doi:10.2307/1912557> is a very popular test for non-nested models.
    Shi <doi:10.3982/QE382> proposed a non-
    degenerate version of the Vuong test using local asymptotic theory.

VignetteBuilder knitr

NeedsCompilation yes

License GPL (>= 2)

Encoding UTF-8

URL https://www.R-project.org

RoxygenNote 7.1.2

RdMacros Rdpack

LazyData true

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R topics documented:

ndvtest   *Shi test for non-nested models*

Description

The Shi test correct the bias of the Vuong test

Usage

```
ndvtest(
  x,
  y,
  size = 0.05,
  pval = TRUE,
  nested = FALSE,
  vartest = FALSE,
  ndraws = 10000,
  diffnorm = 0.1,
  seed = 1,
  numbers = NULL,
  nd = TRUE,
  print.level = 0
)

## S3 method for class 'maxLik2'
llcont(x, ...)

## S3 method for class 'maxLik2'
bread(x, ...)

## S3 method for class 'maxLik2'
estfun(x, ...)

## S3 method for class 'maxLik2'
logLik(object, ...)
```

Arguments

x	a first fitted model,
y	a second fitted model,
size	the size of the test,
pval	should the p-value be computed ?
nested	a boolean, TRUE for nested models,
vartest	a boolean, if TRUE, the variance test is computed,
ndraws	the number of draws for the simulations,

`diffnorm`	a creuser,
`seed`	the seed,
`numbers`	a user provided matrix of random numbers
`nd`	a boolean, if `TRUE` (the default) the non-degenarate Vuong test is computed,
`print.level`	the level of details to be printed,
`...`	further arguments,
`object`	an object of class `maxLik2`.

Value

an object of class `"htest"`

References

Vuong QH (1989). "Likelihood Ratio Tests for Selection and Non-Nested Hypotheses." *Econometrica*, **57**(2), 397-333.

Shi X (2015). "A nondegenerate Vuong test." *Quantitative Economics*, 85-121.

See Also

the classical Vuong test is implemented in `pscl::vuong` and `nonnest2::vuongtest`.

Examples

```
# A poisson model example from the nonnest2 man page
data("housing", package = "MASS")
house1 <- glm(Freq ~ Infl + Type + Cont, family = poisson, data = housing)
house2 <- glm(Freq ~ Infl + Sat,         family = poisson, data = housing)
nonnest2::vuongtest(house1, house2)
ndvtest(house1, house2)
data("bioChemists", package = "pscl")
bio1 <- glm(art ~ fem + mar + phd + ment, family=poisson, data=bioChemists)
bio2 <- pscl::hurdle(art ~ fem + mar + phd + ment, data=bioChemists)
bio3 <- pscl::zeroinfl(art ~ fem + mar + phd + ment, data=bioChemists)
nonnest2::vuongtest(bio3, bio2)
ndvtest(bio3, bio2)
```

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sim_lm *Simulated pdfs for the Vuong statistics using linear models*

Description

This function can be used to reproduce the examples given of Shi (2015) which illustrate the fact that the distribution of the Vuong statistic may be very different from a standard normal

Usage

```
sim_lm(N = 1000, R = 1000, Kf = 15, Kg = 1, a = 0.125)
```

Arguments

N	sample size
R	the number of replications
Kf	the number of covariates for the first model
Kg	the number of covariates for the second model
a	the share of the variance of y explained by the two competing models

Value

a numeric of length N containing the values of the Vuong statistic

References

Shi X (2015). "A nondegenerate Vuong test." *Quantitative Economics*, 85-121.

Examples

```
sim_lm(N = 100, R = 10, Kf = 10, Kg = 2, a = 0.5)
```

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turnout	*Turnout*

Description

these three models are replication in R of stata's code available on the web site of the American Economic Association. The estimation is complicated by the fact that some linear constraints are imposed. The estimation was performed using the maxLik package. As the Hessian is near singular, the bread method for maxLik which use the vcov method returns an error. Therefore, we use a new maxLik2 class and write specific llcont, estfun and bread methods for this class.

Format

a list of three fitted models:

- group: the group-rule-utilitarian model,
- intens: the intensity model,
- sur: the reduced form SUR model.

Details

Turnout in Texas liquor referenda

Source

References

Coate S, Conlin M (2004). "A Group Rule-Utilitarian Approach to Voter Turnout: Theory and Evidence." *American Economic Review*, **94**(5), 1476-1504. doi: 10.1257/0002828043052231, https://www.aeaweb.org/articles?id=10.1257/0002828043052231.

Examples

```
## Not run:
data("turnout", package = "ndvtest")
ndvtest(turnout$group, turnout$intens)
ndvtest(turnout$group, turnout$sur)
ndvtest(turnout$intens, turnout$sur)

## End(Not run)
```

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