Package ‘nopp’

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nopp-package

Nash Optimal Party Positions

Description

Estimation of party/candidate ideological positions that correspond to a Nash equilibrium along a one-dimensional space

Details

Package: nopp
Type: Package
Version: 1.0
Date: 2012-06-26
License: GPL (>= 2)

nopp is a package for R which enables to compute party/candidate ideological positions that correspond to a Nash Equilibrium along a one-dimensional space. It accommodates alternative motivations in (each) party strategy while allowing to estimate the uncertainty around their optimal positions through two different procedures (bootstrap and MC).

Author(s)

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References

Merrill, Samuel III, and James Adams (2001), Computing Nash Equilibria in Probabilistic, Multi-party Spatial Models with Nonpolicy Components, Political Analysis, 9, 347–61

Description

Nash Optimal Party Positions
**equilibrium**

Usage

```r
equilibrium(start = NULL, model = mlogit, data = NULL, tolerance = 1e-05, max.iter = 100,
coa = 0, alpha = 0, margin = NULL, fixed = NULL, gamma = 0,
boot = 0, MC = 0, self.var = "self", prox.var = "prox",
position = NULL, votes = NULL, quadratic = TRUE, conf.level = 0.95)
```

Arguments

- **model**: the `mlogit` model analysis.
- **data**: the data set.
- **tolerance**: tolerance in the convergence of Nash equilibrium. Default `1e-5`.
- **max.iter**: max iteration to convergence in Nash equilibrium. Default `100`.
- **coal**: a list specifying electoral coalitions. See Details.
- **alpha**: the weight of coalition vote-share in party utility function. Default = 0. See Details.
- **margin**: a list specifying the vote share margin to be maximized of a party/coalition against other party/coalition. See Details.
- **fixed**: a list of fixed party positions. See Details.
- **gamma**: the weight among nash and fixed party position. Default=0. See Details.
- **boot**: number of bootstrap replications. See Details.
- **MC**: number of Monte Carlo replications. See Details.
- **self.var**: character: name of self-placement of respondent. See Details.
- **prox.var**: character: name of party-placement variable. See Details.
- **position**: a named list: of perceived position of parties. See Details.
- **votes**: a named list: of actual vote share at election. See Details.
- **quadratic**: a logical value: if `FALSE` the linear utility function is used to calculate the proximity. See Details.
- **conf.level**: significant level for empirical Monte Carlo or bootstrap confidence intervals.

Details

See vignette.

Value

- an object of class `nash.neq`

Note

See the vignette for detailed explanations and other working examples.
Author(s)
Luigi Curini, Stefano M. Iacus

References
Competition. Cambridge: Cambridge University Press
Merrill, Samuel III, and James Adams (2001), Computing Nash Equilibria in Probabilistic, Multi-
party Spatial Models with Nonpolicy Components, Political Analysis, 9, 347–61
Statistical Software, 81(11), 1–25

See Also
See Also as plot.nash.eq

Examples
## Not run:
data(italy2006)

str(italy2006)
italy2006[1:2,1:14]

election <- set.data(italy2006, shape="wide", choice="vote",
varying=c(5:14), sep=".")
str(election)

m <- mlogit(vote~prox+partyID | gov_perf+sex+age+education,
election, reflevel = "UL")
summary(m)

ture.pos <- list(FI=7.59, UL=3.50, RC=1.95, AN=8.08, UDC=5.66)
ture.votes <- list(FI= .24, UL=.40, RC=.10, AN=.18, UDC=.08)
# model 1: comparison against true votes and party positions
nash.eq <- equilibrium(model=m, data=election, pos=ture.pos,
votes=ture.votes)
nash.eq

par(mfrow=c(3,1))
plot(nash.eq)
par(mfrow=c(1,1))

# model 2: coalition behaviours
coal1 <- list(FI=1, UL=2, RC=2, AN=1, UDC=1)
alpha1 <- list(FI=0.5, UL=0.5, RC=0.5, AN=0.5, UDC=0.5)
nash.eq <- equilibrium(model=m, data=election, coal=coal1,
alpha=alpha1)
nash.eq

# model 3: coalition behaviours
italy2006 <- list(FI=1, UL=2, RC=2, AN=1, UDC=1)
alpha1 <- list(FI=0.7, UL=0.8, RC=0.1, AN=0.5, UDC=0.9)
nash.eq <- equilibrium(model=m, data=election, coal=coal1, alpha=alpha1)
nash.eq

# model 4: rivals tends to separate each other
nash.eq <- equilibrium(model=m, data=election, margin=list(FI="UL", UL="FI"))
nash.eq

# model 5: fixed position averaged with Nash equilibrium solution
nash.eq <- equilibrium(model=m, data=election, fixed=list(RC=1), gamma=0.2)
nash.eq

# model 6: rivals tends to separate each other with
# fixed position averaged with Nash equilibrium solution
nash.eq <- equilibrium(model=m, data=election, margin=list(FI="UL", UL="FI"), fixed=list(RC=1), gamma=0.2)
nash.eq

# model 7: coalition and fixed position averaged with
# Nash equilibrium solution
coal1 <- list(FI=1, UL=2, RC=2, AN=1, UDC=1)
alpha1 <- list(FI=0.7, UL=0.8, RC=0.5, AN=0.5, UDC=0.5)
nash.eq <- equilibrium(model=m, data=election, coal=coal1, alpha=alpha1, fixed=list(RC=1), gamma=0.2)
nash.eq

# model 8: Bootstrap analysis
set.seed(280715)
nash.eq <- equilibrium(model=m, data=election, boot=10)
nash.eq

# model 9: Monte Carlo simulation
set.seed(280715)
nash.eq <- equilibrium(model=m, data=election, MC=10)
nash.eq

## End(Not run)

italy2006

Description

2006 Italian General Election survey, with quadratic ideological proximity.

Usage

data(italy2006)
Format

A data frame with 438 observations on the following 18 variables.

- **country**: country name
- **id**: id of respondent
- **vote**: a factor with levels FI UL AN UDC RC for each party voted
- **self**: self-placement of respondent on a 0 to 10 left-right scale
- **prox_FI**: see Details.
- **prox_UL**: see Details.
- **prox_AN**: see Details.
- **prox_UDC**: see Details.
- **prox_RC**: see Details.
- **partyID_FI**: see Details.
- **partyID_UL**: see Details.
- **partyID_AN**: see Details.
- **partyID_UDC**: see Details.
- **partyID_RC**: see Details.
- **sex**: gender variable 1 = female
- **age**: see Details.
- **education**: see Details.
- **gov_perf**: see Details.

Details

In this survey respondents were asked to indicate which party they voted for in the 2006 Election. The data concerns 5 parties: UL (Ulivo), RC (Communist Refoundation party), FI (Forza Italia), AN (National Alliance) and UDC (Union of Christian Democrats).

- **prox_***: quadratic ideological distance between the respondent and a party*
- **partyID_***: binary variable equals to 1 if the respondent declares to feel herself close to party*
- **age**: 1 = "18-24 years", 2 = "25-34", 3 = "35-44", 4 = "45-54", 5 = "55-64", 6 = "65 +"
- **education**: 0 = "up to primary school", 1 = "incomplete secondary", 2 = "secondary completed", 3 = "post-secondary trade", 4 = "university undergraduate degree inc", 5 = "university undergraduate degree comp"
- **gov_perf**: 1 = "very good job", 2 = "good job", 3 = "bad job", 4 = "very bad job"

Source


Examples

data(italy2006)
head(italy2006)
Description

2006 Italian General Election survey, with linear ideological proximity.

Usage

data(italy2006.lin)

Format

A data frame with 438 observations on the following 18 variables.

country  country name
id  id of respondent
vote  a factor with levels FI  UL  AN  UDC  RC for each party voted
self  self-placement of respondent on a 0 to 10 left-right scale
proxlin_FI  see Details.
proxlin_UL  see Details.
proxlin_AN  see Details.
proxlin_UDC  see Details.
proxlin_RC  see Details.
partyID_FI  see Details.
partyID_UL  see Details.
partyID_AN  see Details.
partyID_UDC  see Details.
partyID_RC  see Details.
sex  gender variable 1 = female
age  see Details.
education  see Details.
gov_perf  see Details.

Details

In this survey respondents were asked to indicate which party they voted for in the 2006 Election. The data concerns 5 parties: UL (Ulivo), RC (Communist Refoundation party), FI (Forza Italia), AN (National Alliance) and UDC (Union of Christian Democrats).

prox_* linear ideological distance between the respondent and a party * placement

partyID_* binary variable equals to 1 if the respondent declares to feel herself close to party *
age: 1 = "18-24 years", 2 = "25-34", 3 = "35-44", 4 = "45-54", 5 = "55-64", 6 = "65 +"
education: 0 = "up to primary school", 1 = "incomplete secondary", 2 = "secondary completed", 3 = "post-secondary trade", 4 = "university undergraduate degree inc", 5 = "university undergraduate degree comp"
gov_perf: 1 = "very good job", 2 = "good job", 3 = "bad job", 4 = "very bad job"

Source

Examples
data(italy2006.lin)
head(italy2006.lin)
## maybe str(italy2006.lin); plot(italy2006.lin) ...

italy2006.wide 2006 Italian General Election survey

Description
2006 Italian General Election survey - wide format

Usage
data(italy2006.wide)

Format
A data frame with 524 observations on the following 15 variables.
country country name
id id of respondent
vote a factor with levels FI UL AN UDC RC for each party voted
self self-placement of respondent on a 0 to 10 left-right scale
FI see Details.
DS see Details.
AN see Details.
DL see Details.
UDC see Details.
RC see Details.
pID see Details.
sex gender variable 1 = female
age see Details.
education see Details.
gov_perf see Details.
Details

In this survey respondents were asked to indicate which party they voted for in the 2006 Election. The data concerns 5 parties: UL (Ulivo), RC (Communist Refoundation party), FI (Forza Italia), AN (National Alliance) and UDC (Union of Christian Democrats). The dataset is in wide format. variable from FI to RC identify the placement of those parties, on a 0 to 10 left-right scale, as perceived by the respondent.

pID is a variable that identifies the partisanship of the respondent (where 0=stands for no partyID, 1 = FI partyID, 23 = UL partyID, 3 = AN partyID, 4 = UDC partyID, 6 = RC partyID)

age : 1 = "18-24 years", 2 = "25-34", 3 = "35-44", 4 = "45-54", 5 = "55-64", 6 = "65 +"

education : 0 = "up to primary school", 1 = "incomplete secondary", 2 = "secondary completed", 3 = "post-secondary trade", 4 = "university undergraduate degree inc", 5 = "university undergraduate degree comp"

gov_perf : 1 = "very good job", 2 = "good job", 3 = "bad job", 4 = "very bad job"

Source


Examples

data(italy2006.wide)
head(italy2006.wide)
## maybe str(italy2006.wide) ; plot(italy2006.wide) ...

noppNews

Show the NEWS file

Description

Show the NEWS file of the nopp package.

Usage

noppNews()

Value

None.
plot.nash.eq

Plot function for Nash equilibrium object

Description
Plot function for Nash equilibrium object

Usage
## S3 method for class 'nash.eq'
plot(x,...)

Arguments
x
a nash.eq object

... additional arguments passed to the inner plot function

Details
See vignette.

Author(s)
Luigi Curini, Stefano M. Iacus

References

See Also
See Also as equilibrium

Examples
## Not run:
data(italy2006)
election <- set.data(italy2006, shape="wide", choice="vote", varying=c(5:14), sep=" ")
m <- mlogit(vote~prox+partyID | gov_perf+sex+age+education, election, reflevel = "UL")

true.pos <- list(FI=7.59, UL=3.50, RC=1.95, AN=8.08, UDC=5.66)
true.votes <- list(FI=.24, UL=.40, RC=.10, AN=.18, UDC=.08)

# comparison against true votes and party positions
nash.eq <- equilibrium(model=m, data=election, pos=true.pos, votes=true.votes)
nash.eq
par(mfrow=c(3,1))
plot(nash.eq)
# bootstrap confidence intervals
nash.eq <- equilibrium(model=m, data=election, boot=10)
nash.eq
plot(nash.eq)

c <- c(1,1))
## End(Not run)

set.data  

Prepares data for Nash equilibrium

Description
Prepares data for Nash equilibrium

Usage

set.data(data, shape="wide", choice, varying, sep="_")

Arguments

data the data set
shape either wide or long. Default wide. See Details.
choice the variable indicating the choice made: it can be either a logical vector, a numerical vector with 0 where the alternative is not chosen, a factor with level 'yes' when the alternative is chosen.
varying the indexes of the variables that are alternative specific. See Details.
sep the separator of the variable name and the alternative name (only relevant for a wide data.frame). See Details.

Details
For general examples see the vignette. The arguments shape, choice, varying and sep as as in the `mlogit.data` function.

Value
A mlogit.data object, which is a data.frame in long format, i.e. one line for each alternative. It has a index attribute, which is a data.frame that contains the index of the choice made ('chid'), the index of the alternative ('alt') and, if any, the index of the individual ('id'). The choice variable is a boolean which indicates the choice made. This function use reshape if the data.frame is in wide format. It also has the attribute `call` for further data manipulation in the bootstrap task of `equilibrium`.
Note
See the vignette for detailed explanations and other working examples.

Author(s)
Luigi Curini, Stefano M. Iacus

References

Examples
```r
## Not run:
data(italy2006)

str(italy2006)
italy2006[1:2,1:14]

election <- set.data(italy2006, shape="wide", choice="vote", varying=c(5:14), sep="_")
str(election)

m <- mlogit(vote~prox+partyID | gov_perf+sex+age+education, election, reflevel = "UL")
summary(m)

true.pos <- list(FI=7.59, UL=3.50, RC=1.95, AN=8.08, UDC=5.66)
true.votes <- list(FI=.24, UL=.40, RC=.10, AN=.18, UDC=.08)
# model: comparison against true votes and party positions
nash.eq <- equilibrium(model=m, data=election, pos=true.pos, votes=true.votes)
nash.eq

## End(Not run)
```
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