Package 'zmiop'

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Type Package

Title Zero and Middle-Inflated Ordered Probit Models

Version 0.0.1

Description Contains inflated ordered probit (IOP) models with correlated and uncorrelated inflations in either the ``bottom", ``middle" or ``top" categories. They combine two latent equations: (i) a 'split' probit equation that estimates the effect of covariates on the probability with which the ordered category of interest is inflated, and (ii) an augmented ordered probit equation that estimates the effect of a second set of covariates on the probabilities of observing each ordered choice outcome, conditional on the probability of the inflated ordered category.

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Encoding UTF-8

LazyData true

Depends R (>= 3.5.0)

Imports Rcpp,
mvtnorm,
optimr

RoxygenNote 7.1.2

R topics documented:

coef *coef*

Description

A function to extract coefficients from iop model results.

Usage

```
coef(object, model = c("full", "cutpoints", "inflation", "ordered"), ...)
```

Arguments

object	an object of class iop.mod (output of iop).

Examples

```
model1 <- iop(Y ~ X1 + X2|Z1 + Z2, data=data, type=c('ziop'))
coef(model1)
```

fitted *fitted*

Description

A function that extracts fitted values from an object of class iop.mod.

Usage

```
fitted(
  object,
  newdata = NULL,
  type = c("response.full", "response.ordered", "response.inflation", "linear"),
  ...
)
```

Arguments

object	an object of class iop.mod (output of iop).
newdata	An optional data frame in which to look for variables to use when model fitting.
type	the tye of equation to be fitted. Options include "response.full" (both inflation and ordered probit stages), "response.ordered" (ordered probit stage only) and "response.inflation" (inflation stage only.

Examples

```
model1 <- iop(Y ~ X1 + X2|Z1 + Z2, data=data, type=c('ziop'))
fitted(model1, type=c("response.full"))
```

`iop` *iop*

Description

`iop` fits an ordered probit model with inflations in either the "zero (bottom)" or "middle" categories.

Usage

```
iop(
  formula,
  data = list(),
  weights = NULL,
  offset = NULL,
  na.action = c("na.omit", "na.fail"),
  type = c("ziop", "miop"),
  ...
)
```

Arguments

`formula`	a formula in the form Y ~ X1 + X2... | Z1 + Z2 ... where Y is the ordered probit dependent variable; Xi are the ordered probit stage covariates; and the Zi are the inflation (split population) stage covariates. See `link{formula}`.
`data`	list object of data.
`weights`	an optional vector of weights to be used in the fitting process. Default is NULL.
`offset`	This can be used to specify an a priori known component to be included in the linear predictor during fitting. The same offset is applied to both stages. See `offset`.
`na.action`	a function indicating what should happen when NAs are included in the data. Options are "na.omit" or "na.fail". The default is "na.omit".
`type`	type of inflation ordered probit model to be used. Options are "ziop" or "miop". The type of the inflation model must be specified.

Examples

```
model1 <- iop(Y ~ X1 + X2|Z1 + Z2, data=data, type=c('ziop'))
```

`iop.mod.default` *iop.mod.default*

Description

Default method for a `iop`.

Usage

```
iop.mod.default(x, z, y, weights, offsetx, offsetz, na.action, type, ...)
```

Arguments

object	an object of class iop.mod (output of iop).

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iop.mod.Est *iop.mod.Est*

Description

Raw form of the iop function. For user-friendly formula-oriented command, use iop.

Usage

```
iop.mod.Est(x, z, y, weights, offsetx, offsetz, na.action, type)
```

Arguments

x	covariates for the ordered probit stage.
z	covariates for the inflation (split population) stage.
y	the ordinal dependent variable.
weights	an optional vector of weights to be used in the fitting process.
offsetx	offest value for the ordered probit stage covariates (X). This can be used to specify an a priori known component to be included in the linear predictor during fitting. For more information, see offset.
offsetz	offest value for the inflation (split population) stage covariates (Z). This can be used to specify an a priori known component to be included in the linear predictor during fitting. For more information, see offset.
na.action	a function indicating what should happen when NAs are included in the data. Options are "na.omit" or "na.fail". The default is "na.omit".
type	type of inflation ordered probit model to be used. Options are "ziop" or "miop". The type of the inflation model must be specified.

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miop *miop*

Description

Likelihood function for MIOP model.

Usage

```
miop(est, Y, X, Z, data, weights, offsetx, offsetz)
```

Arguments

est	starting values for the estimation. Vector of length of the number of parameters.
Y	the ordinal dependent variable.
X	covariates for the ordered probit stage.
Z	covariates for the inflation (split population) stage.
data	dataset that contains the dependent and independent variables.
weights	an optional vector of weights to be used in the fitting process.
offsetx	offest value for the ordered probit stage covariates (X). This can be used to specify an a priori known component to be included in the linear predictor during fitting. For more information, see offset.
offsetz	offest value for the inflation (split population) stage covariates (Z). This can be used to specify an a priori known component to be included in the linear predictor during fitting. For more information, see offset.

Value

Likelihood of the MIOP model specification.

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predict *predict*

Description

A function to extract predicted values from the IOP model object.

Usage

```
predict(
  object,
  newdata = NULL,
  type = c("prob.full", "prob.ordered", "prob.inflation", "response.full",
    "response.ordered", "response.inflation", "linear"),
  ...
)
```

Arguments

object	an object of class iop.mod (output of iop).
newdata	An optional data frame in which to look for variables with which to predict. If omitted, the fitted values are used.
type	

Examples

```
model1 <- iop(Y ~ X1 + X2|Z1 + Z2, data=data, type=c('ziop'))
predict(model1, type=c("response.full"))
```

print.iop.mod *print.iop.mod*

Description

Print method for a iop object.

Usage

```
## S3 method for class 'iop.mod'
print(object, ...)
```

Arguments

object	an object of class iop.mod (output of iop).

print.summary.iop.mod *print.iop.mod*

Description

Print method for a iop object.

Usage

```
## S3 method for class 'summary.iop.mod'
print(object, ...)
```

Arguments

object	an object of class iop.mod (output of iop).

residuals *residuals*

Description

A function to extract residuals from iop model results.

Usage

```
residuals(object, type = c("response"), ...)
```

Arguments

object	an object of class iop.mod (output of iop).

Examples

```
model1 <- iop(Y ~ X1 + X2|Z1 + Z2, data=data, type=c('ziop'))
residuals(model1)
```

summary.iop.mod *summary.iop.mod*

Description

Summary method for a iop object.

Usage

```
## S3 method for class 'iop.mod'
summary(object, ...)
```

Arguments

object	an object of class iop.mod (output of iop.

vcov *vcov*

Description

A function to extract variance-covariance matrix from iop model results.

Usage

```
vcov(object, model = c("full", "cutpoints", "inflation", "ordered"), ...)
```

Arguments

object	an object of class iop.mod (output of iop).

Examples

```
model1 <- iop(Y ~ X1 + X2|Z1 + Z2, data=data, type=c('ziop'))
vcov(model1)
```

ziop *ziop*

Description

Likelihood function for ZIOP model.

Usage

```
ziop(est, Y, X, Z, data, weights, offsetx, offsetz)
```

Arguments

est	starting values for the estimation. Vector of length of the number of parameters.
Y	the ordinal dependent variable.
X	covariates for the ordered probit stage.
Z	covariates for the inflation (split population) stage.
data	dataset that contains the dependent and independent variables.
weights	an optional vector of weights to be used in the fitting process.
offsetx	offest value for the ordered probit stage covariates (X). This can be used to specify an a priori known component to be included in the linear predictor during fitting. For more information, see offset.
offsetz	offest value for the inflation (split population) stage covariates (Z). This can be used to specify an a priori known component to be included in the linear predictor during fitting. For more information, see offset.

Value

Likelihood of the ZIOP model specification.

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