Package 'lava.tobit'

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Type Package

Title Latent Variable Models with Censored and Binary Outcomes

Version 0.5

Date 2017-03-29

Author Klaus K. Holst

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Description Lava plugin allowing combinations of left and right censored and
binary outcomes.

URL https://github.com/kkholst/lava.tobit

BugReports https://github.com/kkholst/lava.tobit/issues

Depends lava (>= 1.5), mets (>= 1.2.2), mvtnorm, survival

License GPL-3

LazyLoad yes

RoxygenNote 6.0.1

NeedsCompilation no

Repository CRAN

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R topics documented:

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binary   *Defines variables as binary*

Description

Defines variables of a latent variable model (`lvm`-object from the `lava` package) as binary.

Usage

```
## S3 method for class 'lvm'
binary(x,var=NULL, ...)
## S3 replacement method for class 'lvm'
binary(x, ...) <- value
```

Arguments

x   lvm-object

...   Additional arguments parsed to lower-level functions

var   Formula or vector of variable names

value   Formula or vector of variable names

Details

This function sets the status of variables to 'binary'. For use with the `estimate` method a probit-link will be assumed. Used with the `sim` method normal distributed data will be simulated followed by thresholding at 0. To simulate data where the dichotomous variable has a direct effect on the outcome the `distribution` method can be used, e.g. `distribution(m,~x) <- binomial.lvm("probit")`.

Value

`lvm`-object (or vector of variable names if called without any arguments)

Author(s)

Klaus K. Holst

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clprobit   *Composite Likelihood for probit latent variable models*

Description

Estimate parameters in a probit latent variable model via a composite likelihood decomposition.

Usage

```
clprobit(x, data, k = 2, type = c("nearest", "all"), pairlist,
  silent = TRUE, ...)
```

Arguments

x	lvm-object
data	data.frame
k	Size of composite groups
type	Determines number of groups. With type="nearest" (default) only neighboring items will be grouped, e.g. for k=2 (y1,y2),(y2,y3),... With type="all" all combinations of size k are included
pairlist	A list of indices specifying the composite groups. Optional argument which overrides k and type but gives complete flexibility in the specification of the composite likelihood
silent	Turn output messsages on/off
...	Additional arguments parsed on to lower-level functions

Value

An object of class clprobit inheriting methods from lvm

Author(s)

Klaus K. Holst

See Also

estimate

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lava.tobit   *Estimation and simulation of probit and tobit latent variable models*
                                Framwork for estimating parameters and simulate data from Latent
                                Variable Models with binary and censored observations. Plugin for
                                the lava *package*

Description

Package:	lava.tobit
Type:	Package
Version:	0.4-5
Date:	2012-03-15
License:	GPL-3
LazyLoad:	yes

Author(s)

Klaus K. Holst Maintainer: <kkho@biostat.ku.dk>

Examples

```
library(lava.tobit)
m <- lvm(list(c(y,z) ~ x, y~z))
## Simulate 200 observation from path analysis model
## with all slopes and residual variances set to 1 and intercepts 0:
d <- sim(m,200,seed=1)
## Dichotomize y and introduce censoring on z
d <- transform(d, y=as.factor(y>0), z=Surv(z,z<2))

e <- estimate(m,d,control=list(trace=1),estimator="gaussian")
effects(e,y~x)
```

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lava.tobit.init.hook   *For internal use*

Description

For internal use

Author(s)

Klaus K. Holst

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plotres   *Plot distribution of standardized residuals*

Description

Plot empirical (KM) and model-specific cumulative distribution function of standardized residuals

Usage

```
plotres(x, var = lava::endogenous(x),
  ylab = "Cumulative Distribution Function",
  xlab = "Standardized residuals", main, k, ...)
```

Arguments

x	Model, lvmfit object
var	Character vector of (endogenous) variable names
ylab	Label of x-axis
xlab	Label of y-axis
main	Title of plot
k	Optional group number for multiple group analysis
...	Additional argument

Author(s)

Klaus K. Holst

Examples

```
## Not run:

## Simulate data where (y01,y2)
## follows conditional bivariate normal distribution
## given covariate x. Instead of y01 we observe
## right censored version y2
n <- 200
m <- lvm(c(y01,y2) ~ x)
covariance(m) <- y01~y2
set.seed(1)
d <- sim(m,n)
d$cens1 <- rexp(n)
d$status1 <- with(d,y01<cens1)
d$y1 <- with(d, pmin(y01,cens1))

## Estimate model parameters
d$S1 <- with(d, Surv(y1,status1))
```

```
m <- lvm(c(S1,y2)~x); covariance(m) <- S1~y2
e <- estimate(m,d,control=list(trace=1))

## Plot cumulative distribution functions
par(mfrow=c(2,2)); plotres(e); plot(e)

## End(Not run)
```

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rbind.Surv   *Appending* Surv *objects*

Description

rbind method for Surv objects

Usage

```
## S3 method for class 'Surv'
rbind(...)
```

Arguments

```
...                    Surv objects
```

Value

Surv object

Author(s)

Klaus K. Holst

Examples

```
y <- yl <- yr <- rnorm(10)
yl[1:5] <- NA; yr[6:10] <- NA
S1 <- Surv(yl,yr,type="interval2")
S2 <- Surv(y,y>0,type="right")
S3 <- Surv(y,y<0,type="left")

rbind(S1,S1)
rbind(S2,S2)
rbind(S3,S3)
```

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