

Package ‘lava.tobit’

January 27, 2015

Type Package

Title LVM with censored and binary outcomes

Version 0.4-7

Date 2012-07-11

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Description lava plugin allowing combinations of left and right censored and binary outcomes

Keywords probit model, tobit model, structural equation model

Depends R (>= 2.14), lava (>= 1.1), mvtnorm, survival

License GPL-3

LazyLoad yes

Collate 'binary.R' 'clprobit.R' 'hooks.R' 'onload.R' 'plotres.R' 'rbind.Surv.R' 'tobit.R' 'weighted.R' 'lava.tobit-package.R'

Repository CRAN

Date/Publication 2012-08-16 19:44:26

NeedsCompilation no

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binary	<i>Defines variables as binary</i>
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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
var	Formula or vector of variable names
value	Formula or vector of variable names
...	Additional arguments parsed to lower-level functions

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

`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

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

lava.tobit

Estimation and simulation of probit and tobit latent variable models

Description

Framework for estimating parameters and simulate data from Latent Variable Models with binary and censored observations. Plugin for the lava package

Details

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

```
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)
## 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))
effects(e,y~x)
```

lava.tobit.estimate.hook

For internal use

Description

For internal use

Author(s)

Klaus K. Holst

plotres

*Plot distribution of standardized residuals***Description**

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

Usage

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

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
...	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)
```

rbind.Surv

Appending Surv objects

Description

rbind method for Surv objects

Usage

```
rbind.Surv(...)
```

Arguments

... Surv objects

Value

Surv object

Author(s)

Klaus K. Holst

Examples

```
y <- y1 <- yr <- rnorm(10)
y1[1:5] <- NA; yr[6:10] <- NA
S1 <- Surv(y1,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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