Package 'BayesMFSurv'

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Type Package

Title Bayesian Misclassified-Failure Survival Model

Version 0.1.0

Description Contains a split population survival estimator that models the misclassification probability of failure versus right-censored events. The split population survival estimator is described in Bagozzi et al. (2019) <doi:10.1017/pan.2019.6>.

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Encoding UTF-8

LazyData true

Depends R (>= 3.5.0)

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R topics documented:

Buhaugetal_2009_JCR *Buhaugetal_2009_JCR*

Description

Subsetted version of survival database extracted from Buhaug et al. (2009). It has precisely dated duration data of internal conflict as well as geographic data. Variables Y, Y0 and C were later added by Bagozzi et al. (2019). It is used to estimate the Bayesian Misclassified Failure (MF) Weibull model presented in Bagozzi et al. (2019).

Usage

```
data(Buhaugetal_2009_JCR)
```

Format

A data frame with 1562 rows and 13 variables

Details

lndistx log conflict-capital distance.

confbord conflict zone at border.

borddist confbord * lndistx centred.

figcapdum rebel fighting capacity at least moderate.

lgdp_onset gdp capita in onset year.

sip2l_onset Gates et al. (2006) SIP code (1 year lag) for the onset year.

pcw post cold war period, 1989+.

frst percentage of forest in conflict zone.

mt percentage of mountains in conflict zone.

Y conflict duration.

Y0 elapsed time since inception to Y (t-1).

C censoring variable.

coupx coup d'etat, except if overlapping with other gov't conflict (PHI 1989).

Source

Buhaug, Halvard, Scott Gates, and Päivi Lujala (2009), Geography, rebel capability, and the duration of civil conflict, Journal of Conflict Resolution 53(4), 544 - 569.

mfsurv *mfsurv*

Description

mfsurv fits a parametric Bayesian MF model via Markov Chain Monte Carlo (MCMC) to estimate the misclassification in the first stage and the hazard in the second stage.

Usage

```
mfsurv(
  formula,
  Y0,
  data = list(),
  N,
  burn,
  thin,
  w = c(1, 1, 1),
  m = 10,
  form = c("Weibull", "Exponential"),
  na.action = c("na.omit", "na.fail")
)
```

Arguments

formula	a formula in the form Y ~ X1 + X2... | C ~ Z1 + Z2 ... where Y is the duration until failure or censoring, and C is a binary indicator of observed failure.
Y0	the elapsed time since inception until the beginning of time period (t-1).
data	list object of data.
N	number of MCMC iterations.
burn	burn-ins to be discarded.
thin	thinning to prevent autocorrelation of chain of samples by only taking the n-th values.
w	size of the slice in the slice sampling for (betas, gammas, lambda). The default is c(1,1,1). This value may be changed by the user to meet one's needs.
m	limit on steps in the slice sampling. The default is 10. This value may be changed by the user to meet one's needs.
form	type of parametric model distribution to be used. Options are "Exponential" or "Weibull". The default is "Weibull".
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".

Value

mfsurv returns an object of class "mfsurv".

A "mfsurv" object has the following elements:

Y	the vector of 'Y'.
Y0	the vector of 'Y0'.
C	the vector of 'C'.
X	matrix X's variables.
Z	the vector of 'Z'.
betas	data.frame, X.intercept and X variables.
gammas	data.frame, Z.intercept and Z variables.
lambda	integer.
post	integer.
iterations	number of MCMC iterations.
burn_in	burn-ins to be discarded.
thinning	integer.
betan	integer, length of posterior sample for betas.
gamman	integer, length of posterior sample for gammas.
distribution	character, type of distribution.
call	the call.
formula	description for the model to be estimated.

Examples

```
set.seed(95)
bgl <- Buhaugetal_2009_JCR
bgl <- subset(bgl, coupx == 0)
bgl <- na.omit(bgl)
Y   <- bgl$Y
X   <- as.matrix(cbind(1, bgl[,1:7]))
C   <- bgl$C
Z1  <- matrix(1, nrow = nrow(bgl))
Y0  <- bgl$Y0
model1 <- mfsurv(Y ~ X | C ~ Z1, Y0 = Y0,
                 N = 50,
                 burn = 20,
                 thin = 15,
                 w = c(0.1, .1, .1),
                 m = 5,
                 form = "Weibull",
                 na.action = 'na.omit')
```

mfsurv.stats *mfsurv.stats*

Description

A function to calculate the deviance information criterion (DIC) for fitted model objects of class mfsurv for which a log-likelihood can be obtained, according to the formula *DIC = -2 * (L - P)*, where *L* is the log likelihood of the data given the posterior means of the parameter and *P* is the estimate of the effective number of parameters in the model.

Usage

```
mfsurv.stats(object)
```

Arguments

object	an object of class mfsurv, the output of mfsurv().

Value

list.

Examples

```
set.seed(95)
bgl <- Buhaugetal_2009_JCR
bgl <- subset(bgl, coupx == 0)
bgl <- na.omit(bgl)
Y   <- bgl$Y
X   <- as.matrix(cbind(1, bgl[,1:7]))
C   <- bgl$C
Z1  <- matrix(1, nrow = nrow(bgl))
Y0  <- bgl$Y0
model1 <- mfsurv(Y ~ X | C ~ Z1, Y0 = Y0,
                 N = 50,
                 burn = 20,
                 thin = 15,
                 w = c(0.1, .1, .1),
                 m = 5,
                 form = "Weibull",
                 na.action = 'na.omit')

mfsurv.stats(model1)
```

`mfsurv.summary` *mfsurv.summary()*

Description

Returns a summary of a mfsurv object via `summary.mcmc`.

Usage

```
mfsurv.summary(object, parameter = c("betas", "gammas", "lambda"))
```

Arguments

`object`	an object of class `mfsurv`, the output of `mfsurv`.
`parameter`	one of three parameters of the mfsurv output. Indicate either "betas", "gammas" or "lambda".

Value

list. Empirical mean, standard deviation and quantiles for each variable.

Examples

```
set.seed(95)
bgl <- Buhaugetal_2009_JCR
bgl <- subset(bgl, coupx == 0)
bgl <- na.omit(bgl)
Y   <- bgl$Y
X   <- as.matrix(cbind(1, bgl[,1:7]))
C   <- bgl$C
Z1  <- matrix(1, nrow = nrow(bgl))
Y0  <- bgl$Y0
model1 <- mfsurv(Y ~ X | C ~ Z1, Y0 = Y0,
                 N = 50,
                 burn = 20,
                 thin = 15,
                 w = c(0.1, .1, .1),
                 m = 5,
                 form = "Weibull",
                 na.action = 'na.omit')

mfsurv.summary(model1, "betas")
```

Index