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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R topics documented:

Buhaugsetal_2009_JCR .................................................. 2
mfsurv ................................................................. 3
mfsurv.stats ........................................................... 5
mfsurv.summary ...................................................... 6

Index 7
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

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

```r
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

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 \( DIC = -2 \times (L - P) \), 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)
Description

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

Usage

```r
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

```r
done
```
Index

*Topic datasets
  Buhaugetal_2009_JCR, 2

Buhaugetal_2009_JCR, 2

mfsurv, 3, 6
mfsurv.stats, 5
mfsurv.summary, 6
summary.mcmc, 6