

Double Generalized Linear Compound Poisson models to Insurance Claims Data: R code

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1 R-code, Methods using Double Generalized Linear Models

The function `ComPoissonDGLM` fits the models using double generalized linear models. Input and output, together with R code are given below.

Input

coefficients

The estimated regression coefficients.

formula

A symbolic description of the model to be fit.

dformula

A formula expression of the form `~predictor`. If a response is given, it will be ignored. This specifies the linear predictor for modelling the dispersion.

data

A data frame containing the variables in the model.

exposure

An optional vector of weights to be used in the fitting process.

numclaims

An optional vector of the number of claims.

method

The method used to estimate the dispersion parameters; the default is "ML" for maximum likelihood and the alternative is "REML" for restricted maximum likelihood.

power

Vector of Tweedie power parameter values to be considered.

GSS

Logical flag: if `TRUE`, the Golden Section Search algorithm will be applied using the first two elements in `power` as limits.

tol
The desired accuracy (convergence tolerance) of the Tweedie power parameter.

Output

input
Some of the input given. Needed to compute confidence intervals.

L
Vector of log-likelihood values. If GSS is used, it will have length 1. Otherwise the same length as the input **power**.

L.max
The maximum value of L

power
Input values of Tweedie power parameter.

power.max
The value of Tweedie power parameter corresponding to the biggest log-likelihood value.

a.max
The value of α corresponding to **power.max**.

sd.mean
Standard errors of the parameters in the mean submodel.

sd.dispersion
Standard errors of the parameters in the dispersion submodel.

di
Unit deviances.

zeros
Probability of $P(Y = 0) = P(N = 0)$.

devresid
Deviance residuals for the mean submodel.

dir resid
Deviance residuals for the dispersion submodel.

wd.final
Vector of weights for the final fit in the dispersion submodel.

wm.final
Vector of weights for the final fit in the mean submodel.

mu
The estimated values of $Y(w)$.

phi
The estimated values of the dispersion parameters.

coefficients.mean

The estimated regression coefficients in the mean submodel.

coefficients.dispersion

The estimated regression coefficients in the dispersion submodel.

2 R-code, Standard Error in Double Generalized Linear Models

The function `conf-p` returns the approximated standard error for p , together with the likelihood confidence interval for p .

Input

object

An object from the function `ComPoissonDGLM`.

Output

p.std

Approximated standard error for the Tweedie power parameter.

ci

Confidence interval on significance level 95% for the Tweedie power parameter.