Package ‘zipsae’

June 14, 2021

Type Package

Title Small Area Estimation with Zero-Inflated Model

Version 1.0.2

Description This function produces empirical best liner unbiased predictions (EBLUPs) for Zero-Inflated data and its Relative Standard Error. Small Area Estimation with Zero-Inflated Model (SAE-ZIP) is a model developed for Zero-Inflated data that can lead us to overdispersion situation. To handle this kind of situation, this model is created. The model in this package is based on Small Area Estimation with Zero-Inflated Poisson model proposed by Dian Christien Arisona (2018)<https://repository.ipb.ac.id/handle/123456789/92308>. For the data sample itself, we use combination method between Roberto Benavent and Domingo Morales (2015)<doi:10.1016/j.csda.2015.07.013> and Sabine Krieg, Harm Jan Boonstra and Marc Smeets (2016)<doi:10.1515/jos-2016-0051>.

License GPL-3

Encoding UTF-8

LazyData true

RoxygenNote 7.1.1

Imports stats

Depends R (>= 2.10)

URL https://github.com/dheel/zipsae

BugReports https://github.com/dheel/zipsae/issues

NeedsCompilation no

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Description

A Dataset which is generate with Zero-Inflated Poisson method for Small Area Estimation purpose.
This data is generated based on Zero-Inflated Poisson with EBLUP based model.

Usage

dataSAEZIP

Format

A data frame with 300 rows and 3 variables:

- y  Direct Estimation of y
- x1  Auxiliary variable of x1
- vardir  Sampling Variance of y

Description

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and its Relative Standard Error. Small Area Estimation with Zero-Inflated Model (SAE-ZIP) is a
model developed for Zero-Inflated data that can lead us to overdispersion situation. To handle this
kind of situation, this model is created. The model in this package is based on Small Area Estimation
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Usage

zipsae(data, vardir, formula, PRECISION = 1e-04, MAXITER = 100)
Arguments

data | The data frame with vardir, response, and explanatory variables included with
Zero-Inflated situation also.

vardir | Sampling variances of direct estimations, if it is included in data frame so it is the
vector with the name of sampling variances. If it is not, it is a data frame of sam-
pling variance in order: var1, cov12, ..., cov1r, var2, cov23, ..., cov2r, ..., cov(r-1)(r), var(r)

formula | List of formula that describe the fitted model

PRECISION | Limit of Fisher-scoring convergence tolerance. We set the default in 1e-4

MAXITER | Maximum number of iterations in Fisher-scoring algorithm. We set the default
in 100

Value

This function returns a list of the following objects:

estimate | A Vector with a list of EBLUP with Zero-Inflated Poisson model

dispersion | A list containing the following objects:

• rse : A dataframe with the values of relative square errors of estimation

coefficient | A list containing the following objects:

• lambda : The estimator of model based on Non-Zero data

• omega : The estimator of model based Complete Data

Examples

#Load the dataset in package
data(dataSAEZIPS)

#Extract the vardir (sampling error)
dataSAEZIPS$vardir -> sError

#Compute the data with SAE ZIP model
formula = (y~x1)
zipsae(data = dataSAEZIPS, vardir = sError, formula) -> saezip

saezip$component #to see the result of Small Area Estimation with Zero-Inflated Model
saezip$dispersion$rse #to see the relative standard error from the estimation
saezip$coefficient$lambda #to see the estimator which is gained from the non-zero compilation data
saezip$coefficient$omega #to see the estimator which is gained from the complete compilation data.

head(saezip)
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