Package 'CREDS'

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Type Package

Title Calibrated Ratio Estimator under Double Sampling Design

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Description

Population ratio estimator (calibrated) under two-phase random sampling design has gained enormous popularity in the recent time. This package provides functions for estimation population ratio (calibrated) under two phase sampling design, including the approximate variance of the ratio estimator. The improved ratio estimator can be applicable for both the case, when auxiliary data is available at unit level or aggregate level (eg., mean or total) for first phase sampled. Calibration weight of each unit of the second phase sample was calculated. Single and combined inclusion probabilities were also estimated for both phases under two phase random [simple random sampling without replacement (SRSWOR)] sampling. The improved ratio estimator's percentage coefficient of variation was also determined as a measure of accuracy. This package has been developed based on the theoretical development of Islam et al. (2021) and Ozgul (2020) <doi:10.1080/00949655.2020.1844702>.

License GPL-3

Encoding UTF-8

RoxygenNote 7.2.0

Imports MASS, stats

NeedsCompilation no

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RCRatio   *Calibrated Ratio Estimator under Double Sampling Design*

Description

Population ratio estimator under two-phase random sampling design has gained enormous popularity in present era. This package provides functions for estimation calibrated population ratio under two phase sampling design, including the approximate variance of the ratio estimator. The improved ratio estimator can be applicable for both the case, when auxiliary data is available at unit level or aggregate level for first phase sampled. Calibration weight of each unit of the second phase sample was calculated. Single and combined inclusion probabilities were also estimated for both phases under two phase random sampling. The improved ratio estimator's percentage coefficient of variation was also determined as a measure of accuracy.

Usage

```
RCRatio(N, FSU, SSU)
```

Arguments

N	Population size
FSU	First stage sampling units
SSU	Second stage sampling units

Value

- CalEstimate: Estimate value of calibration estimator
- CalVariance: Variance of calibration estimator
- CV: Coefficient of variance
- SampleSize: Sample Size of FSU and SSU
- DesignWeight: Design weight vector
- InclusionProb: Inclusion probability vector
- Correlation: Correlation value

References

- Islam, S., Chandra, H., Sud, U.C., Basak, P., Ghosh, N. and Ojasvi, P.R. (2021). A Revised Calibration Weight based Ratio Estimator in Two-phase Sampling: A Case when Unit Level Auxiliary Information is Available for the First-phase Sample, Journal of Indian Society of Agricultural Statistics, 75(2), 147–156.
- Ozgul, N. (2021). New improved calibration estimator based on two auxiliary variables in stratified two-phase sampling. Journal of Statistical Computation and Simulation, 91(6), 1243-1256.

Examples

```
f1<-rnorm(100,20,5)
f2<-rnorm(100,20,5)
fsu<-cbind(f1,f2)
s1<-rnorm(50,20,5)
s2<-rnorm(50,20,5)
s3<-rnorm(50,20,5)
s4<-rnorm(50,20,5)
ssu<-cbind(s1,s2,s3,s4)
RCRatio(N=1000, FSU=fsu, SSU=ssu)
```

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