GENERAL RESTRICTION ESTIMATOR IN SMALL AREA ESTIMATION

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Several techniques have been introduced for small area estimation. The performance of small area estimators depends on sample size: model-assisted estimators perform better in large areas and model-dependent in relatively smaller areas. Using different estimators for small and large areas can cause problem that estimated totals of areas do not sum up to population total. The focus of this paper is to investigate possibilities to use general restriction estimator in small area estimation to solve this problem.

The performance of two small area estimators are compared in the paper: 1) Generalised Regression estimator (GREG); 2) Empirical Best Linear Unbiased Predictor (EBLUP). Simulation study showed that quality of GREG and EBLUP estimators depends significantly on the sample size of area. GREG-estimator performs better in relatively large areas according to mean square error (MSE). EBLUP estimator tends to overestimate large areas especially with informative sampling where units with large value of study variable have higher inclusion probability.

For better results it is appropriate to use different estimates for smaller areas and large sub-populations. Obtained estimates do not satisfy the criteria that the sum of estimated small area totals is equal to estimated population total or estimated totals of large domains. One solution of the problem is general restriction estimator developed by Knottnerus (2003). My simulation study showed that general restriction estimator is good procedure for calibration the small area estimators to meet certain conditions. In addition restriction estimators perform slightly better than EBLUP estimator.

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