

## MEAN ESTIMATION WITH ROBUST CALIBRATED ESTIMATORS

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Calibration weighting is a general technique for adjusting probability-sampling weights to increase the precision of estimates to be consistent. Let's, however, focus on the basic conditions: single phase sampling and full response. In practice, survey conditions are not that simple, but many theory papers nevertheless address this situation.

In Rozora et al. (2014) mean estimation with calibration approach was studied. In this paper we continue the investigation of different calibration techniques to estimate mean.

A trimmed mean, as a statistical measure of central tendency, is also considered. The main advantage of the trimmed mean is robustness and higher efficiency for mixed distributions and heavy-tailed distribution (like the Cauchy distribution), at the cost of lower efficiency for some other less heavily-tailed distributions (such as the normal distribution). The algorithm for construction of trimmed mean estimators using calibration techniques (calibrated trimmed mean) is given.

As an alternative way to estimate the population mean in the case of symmetric the median of Walsh averages is considered. The median of Walsh averages has a robustness property and is more efficient, for example, in the case of normal distribution, than trimmed mean. We propose to consider new estimator for the population mean that is based on the using of auxiliary information, calibration techniques and the median of Walsh averages.

The properties of these estimators are studied and natural population example is also considered.

### References

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