



## Sampling Weights Adjustment for Improving Crops Early Estimates' Precision

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The Robustified Ratio Estimator (*RRE*) technique consists in re-weighting sample units identified as outliers through the calculation of standardized differences between observed and expected values. The original sample weights are reduced on the basis of the magnitude of residuals and are used for implementing robust ratio estimation, which is a time saving approach reducing the risk of anomalous estimates. The *RRE* is a time saving approach useful when anomalous micro-data may affect sample estimates precision; it can be also applied when measurement errors occur because of response errors. In the *RRE* process, a crucial phase concerns the choice of the acceptance threshold beyond which a measurement is detected as outlier. In this context, we propose improvements of the *RRE*, based on: i) the use of weights not lower than one; ii) transformation of the original variables in order to tackle the presence of zero values and guarantee the possibility to calculate residuals; iii) an objective criterion for fixing the acceptance threshold and the re-weighting rule, based on the calibration approach. Results of an empirical attempt referred to early estimates of agricultural crops in Italy show how the proper combination among proposed improvements lead to more precise *RRE* estimates. Improved *RRE* estimates are quite similar to those obtained using the actual survey estimation strategy, based on a long and costly data editing process and re-weighting due to calibration. The non response bias has been also estimated for any estimation strategy implemented, in addition to sampling variance.

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