

Influential units occur frequently in surveys, especially in business surveys that collect economic variables whose distributions are highly skewed. A unit is said to be influential when its inclusion or exclusion from the sample has an important impact on the sampling error of estimates. We extend the results of Beaumont et al. (2013) to the case of two-phase sampling designs. In particular, we extend the concept of conditional bias attached to a unit and propose a robust version of the double expansion estimator, which depends on a tuning constant. Following Beaumont et al. (2013), we determine the tuning constant which minimizes the maximum estimated conditional bias. Our results can be naturally extended to the case of unit nonresponse, the set of respondents often being viewed as a second-phase sample.