



Semiparametric inference on general functionals of two semicontinuous populations

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Abstract

In this paper, we propose new semiparametric procedures for inference on linear functionals in the context of two semicontinuous populations. The distribution of each semicontinuous population is characterized by a mixture of a discrete point mass at zero and a continuous skewed positive component. To utilize the information from both populations, we model the positive components of the two mixture distributions via a semiparametric density ratio model. Under this model setup, we construct the maximum empirical likelihood estimators of the linear functionals. The asymptotic normality of the proposed estimators is established and is used to construct confidence regions and perform hypothesis tests for these functionals. We show that the proposed estimators are more efficient than the fully nonparametric ones. Simulation studies demonstrate the advantages of our method over existing methods. Two real-data examples are provided for illustration.

Keywords Empirical likelihood · Density ratio model · Linear functional · Zero-excessive data

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