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On the effect of misspecifying the density ratio model

Abstract The density ratio model specifies that the log-likelihood ratio of two unknown densities is of known linear form which depends on some finite dimensional parameters. The model can be broadened to allow for m-samples in a quite natural way. Estimation of both parametric and nonparametric part of the model is carried out by the method of empirical likelihood. However the assumed linear form has an impact on the estimation and testing for the parametric part. The goal of this study is to quantify the effect of choosing an incorrect linear form and its impact to inference. The issue of misspecification is addressed by embedding the unknown linear form to some parametric transformation family which yields ultimately to its identification. Simulated examples and data analysis integrate the presentation.