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A partial empirical likelihood based score test under a semiparametric finite mixture model

Abstract We propose a score statistic to test the null hypothesis that the two-component density functions are equal under a semiparametric finite mixture model. The proposed score test is based on a partial empirical likelihood function under an I-sample semiparametric model. The proposed score statistic has an asymptotic chi-squared distribution under the null hypothesis and an asymptotic noncentral chi-squared distribution under local alternatives to the null hypothesis. Moreover, we show that the proposed score test is asymptotically equivalent to a partial empirical likelihood ratio test and a Wald test. We present some results on a simulation study.

Keywords Biased sampling problem · Chi-squared · Consistency · Local alternative · Maximum likelihood · Mixture model · Partial empirical likelihood · Power · Score function · Score statistic · Semiparametric selection bias model · Wald test