Estimation and hypothesis test for partial linear single-index multiplicative models

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Abstract

Estimation and hypothesis test for partial linear single-index multiplicative models are considered in this paper. To estimate unknown single-index parameter, we propose a profile least product relative error estimator coupled with a leave-one-component-out method. To test a hypothesis on the parametric components, a Wald-type test statistic is proposed. We employ the smoothly clipped absolute deviation penalty to select relevant variables. To study model checking problem, we propose a variant of the integrated conditional moment test statistic by using linear projection weighting function, and we also suggest a bootstrap procedure for calculating critical values. Simulation studies are conducted to demonstrate the performance of the proposed procedure and a real example is analyzed for illustration.

Keywords Local linear smoothing · Model checking · Profile least product relative error estimator · Single-index · Variable selection

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