

Statistical Estimation in Generalized Multiparameter Likelihood Models

by

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Abstract

Multiparameter likelihood models (MLM) with multiple covariates have a wide range of applications. However, they encounter the “curse of dimensionality” problem when the dimension of the covariates is large. We develop a generalized multiparameter likelihood model that copes with multiple covariates and adapts to dynamic structural changes well. It includes some popular models, such as the partially linear and varying coefficient models, as special cases. When the model is fixed, a simple and effective two-step method is developed to estimate both the parametric and the nonparametric components. The proposed estimator of the parametric component has the root-n convergence rate, and the estimator of the nonparametric component enjoys an adaptivity property. A data-driven procedure is suggested to select the bandwidths involved. Also proposed is a new initial estimator in profile likelihood estimation of the parametric part to ensure stability of the approach in general settings. We further develop an automatic procedure to identify constant parameters in the underlying model. A simulation study and an application to the infant mortality data of China are given to demonstrate performance of the proposed methods.