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Semi-varying coefficient models with a diverging number of components. (English)

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Summary: Semiparametric models with both nonparametric and parametric components have become increasingly useful in many scientific fields, due to their appropriate representation of the trade-off between flexibility and efficiency of statistical models. We focus on semi-varying coefficient models (a.k.a. varying coefficient partially linear models) in a “large n , diverging p ” situation, when both the number of parametric and nonparametric components diverges at appropriate rates, and we only consider the case $p = o(n)$. Consistency of the estimator based on B -splines and asymptotic normality of the linear components are established under suitable assumptions. Interestingly (although not surprisingly) our analysis shows that the number of parametric components can diverge at a faster rate than the number of nonparametric components and the divergence rates of the number of the nonparametric components constrain the allowable divergence rates of the parametric components, which is a new phenomenon not established in the existing literature as far as we know. Finally, the finite sample behavior of the estimator is evaluated by some Monte Carlo studies.

MSC:

62G08 Nonparametric regression and quantile regression
62G20 Asymptotic properties of nonparametric inference
65C05 Monte Carlo methods
65D07 Numerical computation using splines

Cited in 8 Documents

Keywords:

B-spline basis; diverging parameters

Software:

hgam

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