



Marginal quantile regression for varying coefficient models with longitudinal data

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Abstract

In this paper, we investigate the quantile varying coefficient model for longitudinal data, where the unknown nonparametric functions are approximated by polynomial splines and the estimators are obtained by minimizing the quadratic inference function. The theoretical properties of the resulting estimators are established, and they achieve the optimal convergence rate for the nonparametric functions. Since the objective function is non-smooth, an estimation procedure is proposed that uses induced smoothing and we prove that the smoothed estimator is asymptotically equivalent to the original estimator. Moreover, we propose a variable selection procedure based on the regularization method, which can simultaneously estimate and select important nonparametric components and has the asymptotic oracle property. Extensive simulations and a real data analysis show the usefulness of the proposed method.

Keywords Longitudinal data · Quadratic inference function · Quantile regression · Varying coefficient model

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