

Adaptive varying-coefficient linear quantile model: a profiled estimating equations approach

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Abstract We consider an estimating equations approach to parameter estimation in adaptive varying-coefficient linear quantile model. We propose estimating equations for the index vector of the model in which the unknown nonparametric functions are estimated by minimizing the check loss function, resulting in a profiled approach. The estimating equations have a bias-corrected form that makes undersmoothing of the nonparametric part unnecessary. The estimating equations approach makes it possible to obtain the estimates using a simple fixed-point algorithm. We establish asymptotic properties of the estimator using empirical process theory, with additional complication due to the nuisance nonparametric part. The finite sample performance of the new model is illustrated using simulation studies and a forest fire dataset.

Keywords Asymptotic normality · Bias-corrected estimating equations · Check loss · Empirical processes · Single-index model

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