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A Principal Varying-Coefficient Model for Quantile Regression: Joint Variable Selection and Dimension Reduction

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Abstract

A principal varying-coefficient model for quantile regression based on regression splines estimation is proposed. Convergence rate and local asymptotics for the coefficient functions are then derived. Furthermore, penalization is used to obtain joint variable selection and dimension reduction in quantile varying-coefficient models. A group coordinate descent algorithm is adopted for a computationally efficient implementation. Simulations are carried out to investigate the finite sample performance and an application on a real data set is presented.

Keywords and phrases: *Asymptotic normality; B-splines; Check loss function; Variable selection; Varying-coefficient model.*