

Bayesian Spectral Analysis Quantile Regression Models with Shape Restrictions

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Some econometric models are presented based on the Bayesian quantile regression with shape-restricted functions using Gaussian process priors. By assuming the derivatives of the functions to be squares of Gaussian processes, the resulting functions are monotonic, monotonic convex or concave, U-shaped, and S-shaped. Introducing the shape restriction avoids overfitting and helps to smooth the estimates of the conditional quantiles especially for the extreme quantiles. The new shape-restricted quantile regression model is extended to deal with censored data and panel data. Specifically, for the panel data, the model with positive random effects are considered in the stochastic frontier framework. The usefulness of the proposed models are demonstrated using the simulated and real datasets.