

Bayesian Quantile Regression for Nonlinear Mixed Effects Models

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Abstract

Quantile regression (QR) is considered in the Bayesian framework for a class of nonlinear mixed effects models (NLMMs) for longitudinal data. Estimation of the regression quantiles is based on a likelihood-based approach using the asymmetric Laplace density (ALD). Posterior computations are carried out via Gibbs sampling. The Bayesian QR estimator is compared with the mean regression estimator using real and simulated data. Results show that the Bayesian QR estimator not only provides a fuller examination of the shape of the conditional distribution of the response variable, but is more robust to the distribution than the mean regression estimator.