

## Variable Selection in High-dimensional Quantile Varying Coefficient Models

Yanlin Tang

Department of Mathematics, Tongji University, Shanghai, China    tangyl@tongji.edu.cn

In this paper, we propose a two-stage variable selection procedure for high dimensional quantile varying coefficient models. The proposed method is based on basis function approximation and LASSO-type penalties. We show that the first stage penalized estimator with LASSO penalty reduces the model from ultra-high dimensional to a model that has size close to the true model, but contains the true model as a valid sub model. By applying adaptive LASSO penalty to the reduced model, the second stage excludes the remained irrelevant covariates, leading to an estimator consistent in variable selection. A simulation study and the analysis of a real data demonstrate that the proposed method performs quite well in finite samples, with regard to dimension reduction and variable selection.

**Keywords:** High dimensional; LASSO; Linear programming; Nonparametric.