Bayesian endogenous Tobit quantile regression

Parametric $p-$th Tobit quantile regression models with endogenous variables are proposed. The first stage regression of the endogenous variable on the exogenous variables where the $a-$th quantile of the error term is zero is introduced into the hierarchical model. Then, the residual of this regression model is included in the $p-$th quantile regression model in such a way that the regressors are uncorrelated with the error term. To meet the zero $a-$th quantile restriction, the error distribution of the first stage regression is modelled by using the asymmetric Laplace distribution, normal distribution, and their nonparametric scale mixtures. Since the value of is a priori unknown, it is treated as an additional parameter and is estimated from the data. The proposed models are then demonstrated by using simulated data and real data on the labour supply of married women.