Econometrics of Ascending Auctions by Quantile Regression

Description of the Data and Codes

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This document presents a description of the data and the codes used in the empirical application and Monte Carlo simulation exercises considered in the paper. All the codes are in Matlab and can be run on different platforms (Windows, Linux, Mac).

1 Dataset

`data.mat`: file grouping the dataset considered in the paper. The dataset concerns the US Forest Service timber ascending auctions from the states covering the western half of the US (regions 1-6) occurred in 1979. They are available in the internet at the JAE Data Archieve website: http://qed.econ.queensu.ca/jae/2008-v23.7/lu-perrigne/. The variables are as follow:

- Covariates:

apv2, *apv3*: appraisal Value of the timber from auctions with $N = 2$ and $N = 3$ bidders, respectively;

vol2, *vol3*: volume of the timber tract from auctions with $N = 2$ and $N = 3$ bidders, respectively.

- Dependent Variable:

  wb2, *wb3*: winning Bids from auctions with $N = 2$ and $N = 3$ bidders, respectively.

2 Algorithms used in the paper

`MM.m` and `MM_Exp.m`: files used to compute the quantile regression estimator using a Majorize-Minimize algorithm for a given quantile level for both linear and exponential specifications, respectively. The details of the estimator are given in the section 3 of the paper.

`MMw.m`: file used to compute the quantile regression estimator using a Majorize-Minimize algorithm for a given quantile level considering weighted residuals. This algorithm is used in the implementation of the random weighting bootstrap detailed in the section 4.3 of the supplemental material.

`CQR.m` and `CQRw.m`: give computation of the composite quantile regression estimator using a Majorize-Minimize algorithm for a given quantile level. The latter algorithm is used in the implementation of the random weighting bootstrap detailed in the section 4.3 of the supplemental material.

`pdf_psi.m` and `cdf_psi.m`: returns the conditional probability density function and cummulative distribution function of Y evaluated at y given X = x, respectively.

3 Codes used in the Monte Carlo Experiments

`Exg_Part_test.m`: simulation program written for the test of Exogenous Bidder Participation. The details are given at section 5.1 in the supplemental material.

`Vuong_test.m`: simulation program created for the Choice of Specification test. The file `Vuong_lambda_star.m` returns the value of a parameter used in `Vuong_test.m`. The details are given at section 5.2 in the supplemental material.

`CQR_test.m`: simulation program written for the test of Constancy of the Slope Coefficients. The details are given at section 5.3 in the supplemental material.

The files `finsample_perf_exp1.m`, `finsample_perf_exp2.m`, `finsample_perf_exp3.m`, `finsample_perf_exp4.m`, `finsample_perf_exp5.m` are simulation programs considered to investigate the finite sample performance of the quantile regression estimator. The details are given at section 3 in the supplemental material.

4 Codes used in the Empirical Application

`EA_exog_part.m`: application of the test of Exogenous Bidder Participation using the dataset in `data.mat`.

`EA_CQR_test.m`: application of the test of Constancy of the Slope Coefficients using the dataset in `data.mat`.

`EA_Vuong_test.m`: application of the Choice of Specification test using the dataset in `data.mat`.

`EA_CIboot.m`: computation of the private value QR coefficients, optimal screening level, optimal reservation price and seller's expected payoff using the dataset in `data.mat`. The 95% confidence intervals are also computed via pairwise bootstrap method.