ECON-L1350 - Empirical Industrial Organization PhD II - Topics
Instructor: Iivo Vehviläinen

Problem Set 1 – Structural estimation in the Nordic electricity market
You are given hourly data from the Nordic electricity market about the market outcomes (price, quantity), total demand, supply by technologies, input prices, and various weather variants in 2018.

1. Use the given Nordic data to estimate equivalent of Eq. (1) in Puller (2007). Assume first that the quantity $Q_{thermal}$ in data has similar interpretation as the fringe capacity production in Puller (2007). You can throw in all the input prices in the data (coal, natural gas, EU ETS carbon prices, oil). Ignore the temperatures from neighboring states. Estimate the impact for the same hour 18 and use the same dummies.

2. You are also given the mean supply curve from the historic bid data. Cf. you result from above with the provided mean supply curves from bid data.

   a. Draw your estimated supply curve with the historic supply curve of 01/2018.

   b. Use your estimate to provide an estimate of supply elasticity and compare with estimates using the supply curve data (use e.g. +- 1 €/MWh variation in prices).

3. Repeat now the analysis for all hours and try to improve the fit of the bid curve for the whole supply curve. Do not use the curve data directly.

   a. Feel free to experiment with the quantities, controls, and instruments.

   b. Ok to try out different functional forms or non-parametric methods, but this is not expected.

   c. Report your best effort, e.g. the results of the estimation and again visuals on the curve fit.

4. Think through the following

   a. What were the main challenges?

   b. How is any of this useful in other markets?

Submit a concise documentation of your work by email to iivo.vehvilainen@aalto.fi