Market power in the Nordic electricity wholesale market: A survey of the empirical evidence


Sven-Olof Fridolfsson and Thomas P. Tangerås
Research Institute of Industrial Economics, Stockholm

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1 Introduction

• Survey and evaluation of the research aimed at quantifying market power on the Nordic electricity market, Nord Pool

• Questions:
  – What does the research tell us about market power?
  – How robust are these results?
  – Which important issues have been left out?
Outline of the presentation

• Economics of Nord Pool
• Simulating market outcomes
• Results
• Conclusion
2 The Economics of Nord Pool

- Nord Pool is the multi-national power exchange of the Nordic countries, Denmark, Finland, Norway and Sweden
- The main market is the day-ahead (Elspot) market. Hourly *system price* obtained by aggregating bid and ask curves across all Nordic buyers and producers
- Regional transmission capacity constraints sometimes create regional markets and regional prices – up to 7 price areas
  - Scope for system level as well as regional market power
- Hydro power is fundamental energy source (50% of production)
2 Hydro power economics

- Production decision is how to allocate reservoir capacity across time: Decision problem is inter-temporal
- Marginal production cost is an opportunity cost: the expected value of foregone production, the water value
- The water value is unobservable
- Implications for market power estimation:
  - Standard methods relying on marginal cost estimation cannot be used
  - Usual snapshot method can be misleading
  - Necessary to have a cyclical view of the market – reservoir cycle
  - Simulation models appropriate
3 Simulating market outcomes

• Simulate benchmark (socially optimal) production
  – estimate demand
  – estimate thermal marginal production cost
  – allocate hydro production to equalize discounted prices, taking reservoir levels and inflow into account

• Compare
  – benchmark production to real production
  – simulated reservoir levels to observed reservoir levels
  – prices with calculated competitive water values
4 Results

- No evidence of system level market power on Nord Pool

- Some evidence of regional market power
5 Conclusion

• Based on the available empirical evidence, there is no obvious rationale for intervention on the Nordic electricity wholesale market: the market appears to work well

• Time to look elsewhere for market power
  – Long-run market power – investment incentives
  – Vertical integration
  – Market power in base-load (nuclear) production

• Individual bid and ask curves should be made available to allow the use of alternative methodological approaches
Thanks for your attention!