Market transparency through a common data platform: Evidence from Nord Pool

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Information processing by generators, retailers, TSOs, consumers or traders to do risk assessment and optimization strategy

- required balancing
- load
- weather
- prices
- behavior of other players
- futures prices
- actual generation
- transmission capacity
- sudden outages
- traded volumes
Main question

Does more information lead to more efficient outcomes in the electricity markets?
This paper

Objective:
estimate the impact of an increased market transparency on wholesale electricity prices

Empirical strategy:
• implementation of a common data platform in 2015 for the EU’s electricity market
  => a natural experiment

• Nord Pool: multi-national Nordic power market (Denmark, Sweden, Finland, and Norway)
  => a measure of market efficiency: the unique wholesale electricity market price
Empirical setting
The Transparency Platform (since 5 January 2015)

- Developed and operated by ENTSO-E (association of transmission system operators)
  - Regulation on submission and publication of data in electricity markets (SPDEM, 2013)

- Detailed information on Load, Generation, Transmission, Balancing, Outages and Congestion Management (49 data items)

- 9000 registered users
Nord Pool’s day-ahead market

- Nordic market: well-developed liquid market, little evidence of market power
  - large shares of hydropower and nuclear, relative small share of RES (26%)

- The day-ahead market: an auction where power is traded for delivery each hour the next day (the System Price)
  - 95% of the produced electricity is traded

- Real-time aggregated information
  - No data on the number of operating units (≠ Transparency Platform)
Platform’s impact on the wholesale electricity prices (*the System Price*)
Monthly average system price

Transparency Platform
(5 January 2015)
## Platform’s impact on the System Price

<table>
<thead>
<tr>
<th>Variables</th>
<th>Short run (9 months before &amp; after)</th>
<th>Mid run (1 year before &amp; after)</th>
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<tbody>
<tr>
<td>Peak hours (8-20)</td>
<td>0.265 *** (0.101)</td>
<td>0.205*** (0.09)</td>
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<tr>
<td>Platform</td>
<td>-9.498*** (0.522)</td>
<td>-7.359*** (0.321)</td>
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<tr>
<td>Peak x Platform</td>
<td>0.290** (0.133)</td>
<td>0.356*** (0.115)</td>
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**Additional variables:** Temperature, wind generation (MWh), wind squared, hydro reservoir (GWh), actual production (log), EU ETS price (EUR), Coal price (USD), Oil price (USD) and dummies for Holidays, day of the week, month, year
Platform’s impact on regional market competition (zonal pricing)
Nord Pool’s bidding areas

• In case of congestion splits into regions which are under the same regulatory regime
  -5 bidding areas in Norway, 4 in Sweden, 2 in Denmark, 1 in Finland

• System price vs. zonal price
  -system price: calculated based on sale and purchase orders disregarding available transmission capacity between bidding areas in the Nordic market
  -zonal price: Nord Pool calculates a price for each bidding area
Induced congestion and price determination
Platform’s impact on zonal prices

• 35% of peak hours and 24% of off-peak hours have significantly higher zonal prices after the implementation of the platform.

• 10% of peak hours and 32% of off-peak hours have significantly lower zonal prices after the implementation of the platform.
Platform’s impact by zone (Sweden & Denmark)
Platform’s impact by zone
(Norway & Finland)
Conclusion

• Transparency platform can promote efficiency but “too” detailed information may carry substantial costs

• Effects present even in an electricity market originally known for relative high market transparency
  - likely stronger effect in less transparent markets?

• Zonal vs. Nodal prices: should the Nordics (and even Europe) go for nodal pricing?