

The Effect of Flow-Based Market Coupling on Electricity Price Convergence in Central Western Europe

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Overview

Since May 20th 2015 Flow-Based Market Coupling (FBMC) has been used for cross-border capacity allocation in Central Western European day-ahead markets (Belgium, the Netherlands, Luxembourg, France and Germany/Austria), replacing the Available Transfer Capacity method (Van den Bergh et al., 2016). As the physical characteristics of the grid are better represented in the flow-based (FB) methodology, the larger flow domain leads to more price convergence between the different market zones. CASC (2015) estimated in a parallel run that the increased price convergence of the FB method would have resulted in a 95M€ increase in economic surplus (for 2013).

As evaluation of the FB methodology has been limited to descriptive analyses (CREG, 2017), without estimation of a counterfactual, this paper uses regression discontinuity in time to examine whether the introduction of FBMC has increased price convergence.

Methods

Recently, regression discontinuity in time (RDiT) (Hausman and Rapson, 2017) has been used to examine the impacts of strikes on traffic congestion (Anderson, 2014), the effect of gasoline content regulation on air quality (Auffhammer and Kellogg, 2011), the effect of driving restrictions on air quality in Mexico City (Davis, 2008) and the effect of urban rail transit on air quality (Chen and Whalley, 2012).

In this paper, we apply the RDiT methodology to the introduction of flow-based market coupling in Central Western Europe. We focus on the period May 20th 2013 – May 20th 2017. To estimate the price convergence we use hourly time-series data on the day-ahead forecasted total load in the bidding zones, the day-ahead forecasted wind and solar photovoltaic generation in the bidding zones, the gas price, the coal price, the oil price and the CO₂ emission price. Our specification allows for time-varying treatment effects and autocorrelation. We focus on the electricity price difference for the different country-pairs.

Conclusions

The FBMC methodology is an important corner stone of the European Target Model. Before its introduction, parallel runs indicated significant welfare gains, but two years later, a number of European regulators and stakeholders claim that gains are below expectations. This paper aims to answer this question by estimating the effect on electricity price convergence.

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