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Virtual Electricity Markets, Real Manipulation?

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How do you know when a virtual market is being manipulated? In a talk with *Bladerunner* resonances of the blurry boundaries between the real and the virtual, Ziff Environmental Fellow Chiara Lo Prete spoke about her research on a cutting edge area of interest in electricity markets—not manipulation of real-time electricity markets, but manipulation day-ahead electricity markets through virtual bidding to benefit financial transmission right positions.

Both day-ahead electricity markets and financial transmission rights have developed as key components of well-functioning wholesale electricity markets. Day-ahead electricity markets allow participants to create greater certainty in their electricity costs by hedging against real-time price volatility, and financial transmission rights have been developed to hedge costs associated with transmission congestion.

As Lo Prete explained, these markets have recently been experiencing greatly enhanced scrutiny from the Federal Energy Regulatory Commission (FERC), using an enforcement authority enhanced by the EAct of 2005 to prosecute cases of fraud, defined as “any action, transaction, or conspiracy for the purpose of impairing, obstructing, or defeating a well-functioning market.”

In 2013 alone, six cases brought by Federal Energy Regulatory Commission settled this year for a total of approximately \$425 million in penalties and forfeited profits, Lo Prete said—enough, certainly, to get the attention of the traders who work in electricity markets. The enforcement push may be having a chilling effect on financial trading in the power sector, which Lo Prete reported is less active this year than in earlier years.

But, while manipulation of real-time electricity markets is well understood (strategic withholding of supply, for example, has the potential to dramatically increase electricity prices), what it means to manipulate day-ahead electricity markets through virtual bids is less clear. Certainly, strategically placed virtual bids for day-ahead electricity could raise the value of related transmission rights—but over-bidding in the day-ahead electricity market equally certainly creates an opportunity for someone else to enter the market and earn money by correcting the market distortion that had been introduced. The strategy that would be used for ongoing manipulation is not well understood.

The situation has not been helped, Lo Prete explained, by the fact that almost all of the companies charged by FERC with manipulation have entered into settlements subject to confidentiality restrictions that make it difficult to understand exactly what the nature of the manipulation was. Rules of thumb, such as that profitable trading will not be considered manipulation, do not seem to be reliable guides.



In response, Lo Prete gave an overview of her work on two fronts. First, she discussed a possible framework for the analysis of day-ahead market manipulation through virtual bidding, excluding real-time manipulation and focusing on the case of a single financial market participant choosing quantities. The framework distinguishes whether the day-ahead market condition represents an equilibrium or disequilibrium, whether the trader ignores or considers its effect on prices, whether it takes economic or uneconomic virtual positions on the day-ahead market, and whether it holds financially leveraged positions that could profit from the manipulation.

Second, she showed an application of the 1992 equilibrium model developed by Kumar and Seppi to financial transmission right and electricity markets to discuss and illustrate some of the issues, in particular the conditions that may empirically indicate the absence or presence of manipulation.

One finding is that the potential profits of manipulation should be bounded by the entry cost of rival traders who could take advantage of market irregularities—a finding which suggests that a robust financial trading market, with many traders looking for trading opportunities, might be more resistant to manipulation than a market with fewer active traders. If so, Lo Prete's work to clarify the boundaries of manipulation may be especially crucial in preventing traders from abandoning these markets altogether.

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