The Economics of Manipulation of Electricity Markets

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A Manipulation Taxonomy

• Market Power Manipulation
  — “Corners” in markets for storable commodities

• Fraud
  — The release of false information

• Trade Based/Price Impact
  — Trading in size to impact price
Market Power Manipulation

• To distort prices, you have to be able to distort output: spatially, temporally, or in total quantity

• Traditional cornering strategies involve creating spatial and crucially temporal distortions: due to non-storability, those can’t work in power (except perhaps for a hydro generator)

• Control of generation or transmission necessary to distort output: purely financial speculator can’t execute MPM
Trade-Based Manipulation

• Trading in size to impact prices
• In markets with asymmetric information, manipulative trades can be confused with privately informed ones, and have persistent price impacts
  – This more likely with storable commodities/true assets: problematic with electricity
• Manipulators can also potentially exploit purely transitory price impacts that arise from limits on market maker risk bearing capacity
Trade-Based Manipulation II

• High degree of mean reversion in fundamental supply and demand shocks in electricity makes first type of trade-based manipulation difficult

• Academic literature (Kumar-Seppi, Pirrong) implies that exploiting illiquidity (either permanent or transitory) over extended periods requires randomization (mixed strategies of buying and selling)

• Attempts to exploit temporary price impacts over long-term attracts additional liquidity supply that reduces profitability of these strategies
Detecting Manipulation

• Manipulation inherently harder to detect in power markets
  – Market power manipulation: detecting withholding can be very difficult
  – Trade based: superficially seems possible but . . .
    • “Permanent” impact strategies unlikely to be practical due to lack of storability and rapid mean reversion of real shocks
    • May be good justifications for trades that impact price even when they could benefit related financial positions
Intent

- Evaluating stand alone economics of a trade provides powerful information on intent
- The existence (or not) of a more profitable (nearly) perfect substitute trade is a powerful way to identify whether a particular trade is manipulative
- Sometimes it is possible to identify such trades (Ferruzzi soybeans)
- Other times it is more difficult
Evaluating Alternative Trades

• Trades can differ on many dimensions
• Crucially, the risk characteristics of trades can differ
• Firms may engage in trades that lose money in a particular instance or on average if this reduces risk
• Thus, unprofitability of a trade or series of trades on a standalone basis not sufficient to infer manipulative intent
• Profitability (measured using opportunity cost) on a standalone basis sufficient to reject manipulation allegation
What Is the Alternative Trade?

• Need to be careful in identifying feasible alternative trades to achieve same outcome on all relevant dimensions including risk
• No trade? How do you justify that if some trades adjust risk-return profile in potentially favorable ways?
• Sometimes the accused identifies a motive for a trade that permits identification of alternatives and estimation of relevant opportunity cost
• EG, Ferruzzi case I mentioned earlier
Documenting Impact

• Need to control for other factors when attempting to quantify impact empirically
• In day ahead markets: forecast load or weather, fuel prices, outages
• Manipulation affects relative prices, so in nodal or zonal markets, look for relative price moves between related markets, some of which the alleged manipulator does not trade in: this helps control for (unobserved) fundamentals
• Price in market where manipulator trades should move relative to related markets where he doesn’t
Economics and the Law

• Don’t get me started: how much time do we have?
• To be brief:
• Manipulation law (securities, commodities, power) is a mess: almost completely at odds with economics
• In its infinite wisdom, Congress has made things worse by Xeroxing Securities Act language and inflicting it on FERC, CFTC, and FTC
The Biggest Problem

• FERC, FTC, and new CFTC anti-manipulation authorities apply language suitable to prosecute information/fraud-based manipulations to situations where market power manipulations are likely to be the biggest concern.

• This is a recipe for incoherence: enforcement constantly trying to pound square market power peg into round fraud hold.

• ETP case, Radley case.