

The Political Economy of Electricity Markets
A Brief History
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- I. Economists' critique of regulated vertically integrated electricity markets
 - A. Prices are cost-recovery accounting devices rather than resource allocation signals.
 - B. Prices too low on-peak and too high off-peak.
 - C. Investment returns guaranteed
 - D. Generators could operate in an unregulated competitive market.
 - E. Results
 - 1. Inefficiently large generation investment
 - 2. Capital stock underutilized off peak
 - 3. Secular increase in peak demand that "must be met" through more supply
- II. Politicians' critique of regulated electricity markets - circa early 1990s
 - A. Kentucky prices 4.3 cents and Long Island 12 cents. Implication is that unexploited gains to trade exist.
 - B. Many industries in New England and New York said that if government didn't change policies to lower electricity prices, they would expand elsewhere (Grumman on Long Island and Raytheon in Massachusetts)
 - C. Electricity spot prices (observed after the Energy Policy Act of 1992 deregulated interstate wholesale electricity markets) were lower than regulated tariffs because of cheap natural gas fired power that flourished under the provisions of the 1978 Public Utilities Regulatory Policy Act. And large users wanted access to that spot price.

- III. The political response to the critiques was "deregulation" of retail electricity markets in the Northeast and California
 - A. Really wasn't deregulation
 - B. Rate cut followed by a rate freeze designed to look good to voters. But rates were still above wholesale rates by quite a bit in the late 1990s. The surplus was used to pay off the not yet fully depreciated assets of nuclear plants (and some coal) whose owners feared devaluation of their assets in a true free market for generation

- IV. Transition price freezes have ended for most companies in most states and rates have risen dramatically - the 72% rate increase for BG & E in Maryland in 2006 is an example. Why?
 - A. The simple answer is fuel costs.
 - 1. From 1979-2000 inflation adjusted coal prices went from over \$50 per ton (2000 dollars) to \$24. Since 2000, inflation adjusted prices have increased by almost 50% to over \$33 (2000 dollars).
 - 2. Natural gas prices have increased over three fold from around \$2 per 10³ ft³ to over \$7 in 2005 and around \$6.50 in 2006 but down to \$5.60 at the end of 2008.
 - B. The complicated answer
 - 1. Rents to inframarginal generators treated differently under regulation
 - a. Under regulation, prices to consumers are weighted average costs - economic rents to inframarginal nuclear and coal generators are suppressed.
 - b. In deregulated market, all generators receive the same price, the price necessary to induce most costly generator necessary to meet demand (often a natural gas fired generator) to operate.
 - 2. In the absence of real time metering and pricing generators anticipate little demand response because consumers don't see prices.

- IV. C. One might conclude that consumers thus lose under deregulation and win under regulation but reality is more complicated.
1. In short run nuclear and old coal plants receive "excess profits" (economic rents).
 2. But as long as entry is allowed, new plants will seek the profits and enter until returns on generation are "normal." But these rents cannot be dissipated by entry if they are the product of clean air act status. **Can't build an "old" coal plant.** Thus entry was all natural gas. Coal entry to dissipate rents may not be possible.
 - a. Consider events in Texas. Utilities in Texas were allowed to pass fuel-cost increases on to consumers on a yearly basis
 - b. There was no provision, however, for passing through fuel-cost decreases.
 - c. Post Katrina natural-gas prices pushed the cost of electricity to between 15 and 19 cents per kWh, but electricity prices did not adjust down when natural gas prices fell.
 - d. Those high prices, which result in large profits for coal-fired plants, induced TXU, the largest generator in Texas, to announce plans to build 11 more coal plants.
 - e. Ironically, the much praised plan by Kohlberg Kravis Roberts & Co. to take over TXU and build only three coal-fired power plants is a plan to keep power costs higher than they would be with free entry. Environmentalists and plant owners win while ratepayers lose.
 3. But don't forget that consumers lose under regulation when spot prices are lower than regulated prices as they were in 1995-2000, which was the impetus for "deregulation" in the first place.
 4. People forget that all those merchant generators who went bankrupt in the early 2000s would have passed those costs onto ratepayers in the regulated world

- V. How should we evaluate the current system in deregulated states?
- A. 1990-2007 prices in deregulated states rose 4.3 cents per kWh and only 2.1 cents per kWh in regulated states but Joskow reports that 1970-2003 prices in deregulated states are lower by 5-10%. Prices should go down faster in deregulated states as fuel costs decrease in current recession.
- B. Texas is the only state that is allowing market price signals dictate generation investment
1. In other states the decision has been made that consumers will not tolerate true market peak prices, the rents that follow from such prices, and the resulting lag in investment that eventually lowers those prices.
 2. Recent article in *Public Utilities Fortnightly* (Jan 2009) describes the muted role that peak demand prices play when the cost of peak capacity are mandated and socialized in New York.
- C. **Demand response** is just as important as **generator competition** in reducing electricity prices
1. Generators must believe that some consumers will change behavior in response to prices
 2. Benefits for all can come from real time pricing for commercial and industrial users (Borenstein EJ 2005:3)
 3. In a real deregulated world Tim Brennan argues that the Coase theorem predicts that if "bad" pricing is as large a problem as we think utilities would install meters and pay consumers to switch. Doesn't matter that we have an inefficient status quo as long as the costs fall on an entity who can pay everyone to change.
- D. Generation and transmission are economic substitutes as well as complements.
1. Generation can be distant from consumers with extensive transmission or closer to consumers without
 2. Transmission is all fixed and no marginal cost (unless congested) and has public good properties because benefits cannot be confined to those who pay
 3. Locational marginal pricing efficiently uses an existing generation and transmission system but provides little insight into expansion of such a system. Transmission rents don't serve the same

entry-inducing function that rents serve in other markets.

4. Transmission has public good properties because benefits cannot be confined to those who pay
5. Can optimal investment arise through decentralized system of prices and contracts?
6. Vertical integration may be optimal organizational design.

VI. What To Do?

- A. Generators must believe that their prices are seen by some consumers and that some of the consumers will change their behavior if prices change.
- B. If we are going to have markets we need to facilitate entry and understand better whether the existence of rents motivates anyone to dissipate them over what time frame
- B. Electricity transmission issues strike me as similar to unitization issues in petroleum reservoirs - a mismatch between geography of ownership and true incidence of benefits.
- C. The division of the surplus between generators, transmitters, and distributors and consumers seems to me to be a classic example of the hold-up problem. There are gains to trade, but once commitments are made, the parties can renege.
 1. Fixed through vertical integration or long-term contract.
 2. Interaction through spot markets only seems an unlikely equilibrium to me.
 3. Participants might very create something through contract that had some of the certainty features of regulation
- D. I know what is not possible -- long term contracts that are abrogated for spot markets only when spot prices are low, which is what in effect we did in the 1990s.
- E. This is the most complicated market I have ever studied. Humility is in order. Instead of "designing" the answers we ought to facilitate experimentation, which is what happens in all real markets