Strengths & Weaknesses of Traditional Arrangements for Electricity Supply

Richard Schmalensee

IAEE Electricity Markets Assessment Webinar

October 11, 2021
Structuring an Impossible Assignment

• “Traditional (pre-1990s) Arrangements” varied enormously, even within the US
• “Strengths and Weaknesses” of what traditional arrangements, relative to what real (rather than ideal) alternatives?

• I took a road-brush approach in my chapter:
  • Restructuring always dramatically increased the role of competitive markets
  • The US has had restructured & “traditional” arrangements; a US focus holds much constant
  • So, looked at cross-section performance differences associated with restructuring, mainly in the US

• Following the Handbook’s organization, I considered two different regimes:
  • The historical regime: thermal generation dominates, could draw on lots of experience/data.
  • The emerging regime: VRE generation dominates, mainly compared CA and HI (both moving toward carbon-free electricity by 2045)
Performance in the *Historical* Regime

• Despite familiar technologies, experience with tight power pools that mimicked competition, making wholesale markets work was not simple(!)

• *Generation Operations*: restructuring/competition reduced costs, nodal pricing further increased efficiency (in the US...), but market power likely increased price-cost gaps

• *Generation Capacity*: the initial belief seems to have been that, as elsewhere, sales revenues would provide adequate investment incentives, but price caps & very high reliability standards were imposed. Capacity now largely administratively determined, *as in traditional systems*. We have *hybrid* systems.

• *Retail Pricing*: Large US customers have access to time-of-use pricing with or without restructuring; retail competition has not generally led to more efficient pricing (and has not always worked well, at least in the US)
Performance in the Emerging Regime

• Planning & operating efficient high-VRE systems will require solving new problems
  • Traditional systems & their regulators (e.g., HI): grope toward efficient outcomes
  • Regulators of restructured systems (e.g., CA): modify historical regime market designs to attempt to induce efficient outcomes

• Generation Operations: storage novel & important; organized markets developing new rules & CA issuing mandates; HI working project-by-project, no general rules

• Generation Capacity: capacity mechanisms need major reform for VRE and storage. HI proceeding project-by-project; CA mandating flexible capacity, storage

• Retail Pricing: wholesale spot prices will have more highs & lows, so real-time pricing will be more valuable. CA & HI don’t have retail competition; neither regulator moving rapidly toward real-time pricing.
Some Tentative Conclusions

• In the *historical* regime, restructuring has led to more efficient operations, but
  • Capacity mechanisms, hybrid systems are not textbook ideal, and
  • Restructuring has not generally led to more efficient retail prices, at least not in the US
  • It is hard to see a large performance gap between traditional and restructured systems

• In the *emerging* regime, traditional systems may have more flexibility *in principle* to meet novel challenges via IRP, without the need to devise new market designs

• But dealing with new challenges may increase utilities’ information advantages and slow regulatory proceedings; traditional systems’ advantages, if any, may be temporary

• The US will continue to have both traditional & restructured systems, so we’ll be able to see how “Strengths and Weaknesses” evolve as the energy transition continues!
Thank you!

energy.mit.edu  f  __  @mitenergy