

**Post-PUHCA Consolidation of Electricity:  
Five Economic Facts That Should Make Us Somewhat Uncomfortable**

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For 70 years the Public Utilities Holding Company Act limited the geographic reach of energy mergers, prohibited non-utility acquisition of certain energy assets, and prevented large energy companies from diversifying into non-utility activities.

The repeal of PUHCA has been heralded as freeing up energy markets from such antiquated and artificial constraints. It is supposed to launch the next round of efficient restructuring of electricity and natural gas markets. By removing these constraints, we are told, energy assets will be deployed in a more efficient manner. Mergers between non-contiguous companies and between energy and non-energy companies will occur where there are gains to be had. Diversification will permit more investment where it is needed, most notably in transmission.

To that I say, maybe so, but maybe not. There were reasons why PUHCA came into existence, and the question is whether those no longer apply. During the 1920s and 1930s, accounting irregularities, high debt-equity ratios, self-dealing by holding companies with their subsidiaries, and mergers conferring market power were commonplace among utilities. In fact, 75 utility holding companies either defaulted or failed during this period, with a variety of adverse effects ultimately resulting in congressional action in the form of PUHCA.

In the present era when numerous companies—not just in energy, but throughout the economy—are found to be violating securities regulation, antitrust laws, and their contractual

obligations, jeopardizing investors' confidence, consumers' dependence, and workers' livelihoods and pensions, the question is whether the other protections that have been added will address these concerns. Views on this question differ. There clearly are many more protections in place than when PUHCA came into being, but of course current problems have occurred with both those protections and PUHCA.

One issue on which most observers agree is that PUHCA repeal is going to result in accelerated restructuring and consolidation of the electricity sector. Much has already occurred in the past decade, of course, and several new mergers have recently come before FERC. FERC's approval of those, along with relaxation of the constraints represented by PUHCA, can only foster more such activity.

Today I want to discuss some facts that we should not forget as we embark on this path. These are facts gleaned from economic research, including my own, into the efficiencies of different utility and market structures. For reasons that will become clear, I am calling these Five Economic Facts That Should Make Us Somewhat Uncomfortable.

**Fact One: Most mergers in electricity and elsewhere represent the triumph of hope over experience.**

There are literally thousands of mergers economy-wide each year, and they have been extensively studied by economists. Hartman summarizes the overall evidence as follows: "Most ex ante analyses of expected merger efficiencies are inaccurate... Ex post analysis of merger performance indicates that the majority of ex ante studies developed to assess merger-induced efficiencies are usually overly optimistic. This is true for efficiency studies, productivity studies, and event studies. This is true for mergers in this country and internationally, for mergers in this

country over the last century, for mergers in competitive sectors and for mergers in recently deregulated sectors. Almost all mergers are undertaken with the ex ante prediction that benefits and efficiencies will occur. However, ex post, the vast majority (60%-80%) of mergers can be characterized as unsuccessful.”

With respect to electric utility mergers in particular, Anderson concludes that “only 15 percent of mergers and acquisitions (M&A) have achieved the financial objectives that were expected prior to the deal.”

My on-going work with Michael Pollitt of Cambridge University is investigating the substantial merger wave in the US electricity sector between 1994 and 2003. We have before-and-after data on the efficiency of approximately fifty merging units, both acquirers and the target companies. Our evidence suggests that target electric utilities overall were not poor performers, as many merger proponents claim. Rather, they operated at efficiency levels higher than those of the acquiring firms: It was the latter that represented the poor performers. After merger, however, sellers’ performance levels declined, often dramatically, indicating that mergers actually hurt their operating efficiency.

These findings do not imply there is never a basis for mergers. But as we move into an era of major mergers, this evidence should serve as a stark reminder that mergers do not routinely achieve efficiencies or spread superior operating methods to acquired units.

**Fact Two: Economies of electricity generation are fully captured at relatively modest scale.**

**Mergers past that point do not reduce costs but may create market power.**

The evidence with respect to economies in generation is overwhelming and long understood. A fragmented, competitive generation sector was the linchpin of de-integration of

traditional electric utilities. Nonetheless, the generation sector has been rapidly consolidating. The fraction of nationwide generation capacity held by the 10 largest IOUs grew by 50% between 1992 and 2000, and has continued to increase. Four or 5 utilities now account for the majority of generation capacity available in a number of regional markets.

And that concentration carries with it some real risks. Apart from conventional concerns about coordinated behavior among fewer sellers, there are novel dangers from even more modest degrees of concentration in electric power generation. Because of transmission constraints, generation markets are often quite small, conferring transient market power of an extreme nature. The California experience is an object lesson in the ability of single sellers to unilaterally withhold output with enormous effects on price. My own work on withholding demonstrates how frequently the conditions for gaming the system are likely to exist. In addition, auction markets involving few sellers make it possible to identify the marginal generating unit, inducing sellers to bid strategically.

These practices are not readily analyzed by standard tools of economic analysis like HHI and are not easily remedied by traditional regulatory oversight or by antitrust policy. This is quite worrisome, since the mechanisms in place are vulnerable to such practices. We can confidently predict such practices will be with us for some time.

**Fact Three: Economies of electricity distribution are fully captured at moderate scale.**

**Mergers among large distribution utilities should not be expected to reduce costs.**

A considerable number of statistical studies have been conducted on this question, and all the evidence is quite consistent. Hartman (again) reviews and summarizes this evidence up through the late 1990s as follows: “The preponderance of the econometric evidence in these

analyses indicates that the minimum efficient firm size for an electric utility falls in the range of 9000-30,000 GWh of generation and 10,000-35,000 GWh of sales...This conclusion is robust to a wide variety of time periods and sample utilities reflected in the alternative data bases used.”

My own study published earlier this year emphasized the important interplay of output, customer density, and average usage as co-determinants of costs. I examined data on hundreds of utilities and found that economies of scale diminished to very small magnitudes at moderate scale of operation. The cost disadvantage of operating at scales down to 17 Mwh, for example, was less than 5%. I also distinguished scale economies in the wires function vs. the sales function, and found the cost curve for sales was nearly flat throughout, while the capital-intensive wires business embodied most of the important economies. In addition, this study showed that customer density on a distribution network and average customer usage were at least as important as output itself in determining costs..

These results caution against any expectation that distribution mergers will yield major cost savings. Savings are likely to be especially elusive for non-contiguous mergers, but even for those involving adjacent service territories, simply aggregating two networks is unlikely to produce savings. It is not simply length, but density and usage, that matter most, and the latter are not altered by merger.

**Fact Four: Deintegration of electric utilities has had costs, and those costs have not been recovered by the current de-integrated industry.**

Many observers originally argued that vertical integration was an anachronism and would quickly be supplanted by some market process that would arise in conjunction with competition in generation. But this was always too quick a dismissal of the vertical issues. Economics has

long taught that integration may be better able to achieve coordination, communication, quick response, and unambiguous responsibility for outcomes, than the market process, and electricity seemed like a plausible candidate for such efficiencies.

There are now a number of economic studies that show this to be the case. My own study of 147 IOUs exploits the fact that prior to restructuring each utility was integrated to a different degree—s few not at all, many partially, some fully. By comparing their total costs for the same final output, and controlling for many other factors, one could test whether integration matters, and in which direction. The evidence is startlingly clear: Integrated utilities had considerably lower costs for the same output, and this was especially true if they were nearly fully integrated. The implication for electricity restructuring is also startling: If de-integration has net benefits, the gains from (say) generation competition must be quite large—large enough to offset the losses from vertical separation. That may well be true, but I know of no study that shows that.

At a more practical level, it is clear that deintegration has periodically contributed to decreased reliability of supply, as generators fail to meet their obligations knowing that the consequences to them are limited by contractual penalties. As economics teaches, and NERC repeatedly has cautioned, contractual penalties represent a weaker incentive than the regulatory compact of old.

None of this is an argument for integration, much less re-integration, of electric power. Rather, it is a reminder that deintegration of the electric power sector is very much a two-edged sword.

**Fact Five: An efficient and effective method for mediating wholesale competition has yet**

**to be devised.**

For more than a decade FERC has sought to strengthen wholesale competition by allowing generators to supply more distant markets. This objective was thwarted by widespread discriminatory access to the transmission grid owned by vertically integrated utilities. This problem has not been remedied by open access requirements, nor by partial deintegration, nor by RTOs. Open access rules were cumbersome and often ineffective. Deintegration helped, but it created a regional patchwork of asymmetric competition under which some market participants enjoyed the advantages of vertical integration while others remained very dependent.

The RTO approach, which seeks to divorce operation from ownership of the grid, is clever, but it has proven inadequate to the tasks of managing congestion and infrastructure investment. TLR actions and congestion charges have grown enormously in some regions in the past few years. Everyone agrees that transmission investment has been inadequate, but the RTO mechanism is poorly suited to address that. In addition, RTOs have become alarmingly expensive. Lutzenhiser reports total operating costs of all ISOs and RTOs in 2004 of over \$1 billion dollars, in some regions adding a full dollar per Mwh to wholesale costs.

High costs, weak governance, poor results, and regional opposition have stalled the RTO experiment. Many feel that it is time to consider alternatives, especially in regions where transmission ownership and operational control remain in the hands of entities with major generation assets. Among the more promising of these are transcos--standalone entities that own and operate a regional grid. Under this approach, all transmission assets in the region would be transferred to the transco, which operates those assets on behalf of all users--including new users who are free to join. The transco's incentives are no longer are simply to discriminate, but rather to operate and to expand the grid on behalf of the entire set of market participants.

FERC has in fact signaled its interest and willingness to consider the transcos alternative—a welcome sign in the quest for an efficient and effective approach to this persistent difficulty.

## **Summary**

Lest this assessment sound too pessimistic, it should be emphasized that these five economic facts are not intended to constitute an argument against restructuring, and certainly not an argument for going back to the old structures. Change is a fundamental part of the process of enterprise and market improvement, and the utility and market structures that preceded reforms were not sustainable. But the changes undertaken in electricity restructuring have often proven to be misinformed and misguided. They have been made with too little attention to the particular features of electricity, features not shared by other industries, and with too little attention to the actual evidence about electricity markets, including some of the above facts that were well known but not heeded. Any hope that deregulated electricity markets would follow the example of airlines or even telecom is in vain, and simply appeals to deregulation elsewhere sooner or later encounters the uncomfortable fact that extracting true efficiencies from consolidation and reorganization is a much more challenging task than often realized and therefore that success in the effort is by no means assured.



## REFERENCES

Anderson, James, "Making Operational Sense of Mergers and Acquisitions," *Electricity Journal*, Aug/Sept 1999

Hartman, Raymond, "The Efficiency Effects of Electric Utility Mergers: Lessons from Statistical Cost Analysis," *Energy Law Journal*, 1996

Hartman, Raymond, "Predicting the Efficiency Effects of Mergers," *Journal of Forensic Economics*, 1996

Kwoka, John, "Vertical Integration in Electric Power: Evidence on Integration and Its Alternatives," *International Journal of Industrial Organization*, 2002

Kwoka, John, "Electric Power Distribution: Economies of Scale, Mergers, and Restructuring," *Applied Economics*, 2005

Kwoka, John "Unilateral Withholding: Market Power and California's Electricity Crisis," George Washington University Center for Economic Research Discussion Paper, May 2001

Kwoka, John "Coordination Economies, Asymmetric Competition, and the Transco Alternative," draft available Feb. 2006

Kwoka, John, and Michael Pollitt, "Restructuring and Efficiency in the U.S. Electric Power Sector," draft available Jan. 2006

Michaels, Robert, "Vertical Integration and the Restructuring of the U.S. Electricity Industry," Cal State Fullerton, 2004

Ravenscraft, David, and F.M. Scherer, *Mergers, Sell-Offs, and Economic Efficiency*, Brookings, 1987