

DEREGULATING ELECTRIC UTILITIES: A MARKET-PROCESS APPROACH

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Introduction

The basic assumptions on which public utility regulation have been built are increasingly challenged. Longstanding policy prescriptions no longer have unwavering support from academicians, politicians, or executives in the regulated industries. There appears to be a widespread recognition that, due to exhaustion of scale economies, the generation sector of the electricity industry may accommodate a competitive market structure.¹ But can any of the many proposals for rearranging the industry enhance the competitive market process? It would be foolhardy to assume deregulation reforms necessarily mean more competition without examining what these proposals can realistically be expected to accomplish.

Many deregulation schemes call for divestiture of currently integrated generation and transmission functions,² while less ambitious

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¹See L. R. Christensen and W. H. Greene, "Economies of Scale in U.S. Electric Power Generation," *Journal of Political Economy* 84 (August 1976): 655-76.

²See William W. Berry, "The Case for Competition in the Electric Utility Industry," *Public Utilities Fortnightly* 110 (September 1982): 12-20. Berry presents one of the few pro-divestiture viewpoints within higher management of investor-owned electric utilities in the United States. Also see Matthew Cohen, "Efficiency and Competition in the Electric-Power Industry," *Yale Law Journal* 88 (1979): 1511-49. Cohen presents one of the more ambitious divestiture proposals. A modified version of Cohen's proposals appears in *Promoting Efficiency in the Electricity Sector*, Congress of the United States, Congressional Budget Office (Washington, D.C.: Government Printing Office, November 1982).

reforms require forcing access to sources of power for independent distributors.³ In a typical deregulation proposal:

A regional transmission company, which would be regulated or government-owned, would purchase electricity from competing, separate generating companies and would sell it to all distributors in the regions.⁴

These reformists assume that transmission of electricity would remain a natural monopoly. Therefore, they argue that single ownership of transmission and generation facilities would defeat the purposes of competitive reform in generation; integrated firms would continue to behave as monopolists. Their proposals present an irony: To create one of the conditions for perfect competition (the existence of a large number of competing firms) in the generation of electricity, the force of government must be used either to sever existing integration or to force contracts that utilities would not voluntarily make. The possible costs of disintegration and the gains from vertical integration are either ignored or lightly dismissed. Instead, reformists accept as an article of faith that no good can come from vertical integration; thus, they argue that disintegrating existing firms and disallowing industry entry by vertically integrated firms will do no harm. Their arguments seem designed less to aid our understanding of how the industry operates than to find the "obvious" flaws in it so they can then proceed with their policy recommendations.

In contrast to these partial reforms, this paper offers a deregulation proposal that advocates the removal of economic regulation at all levels of activity. Such change is not without transitional cost. Consequently, the removal of economic regulation in the proposal is conditioned by the final consumer's willingness to accept an open market. The consumer is given rights to an open market, a "market option," which he then can exercise, assign to another party, or hold unsigned. Consumers holding unsigned options would retain utility commission regulation over their transactions. The market option, coupled with removal of legal entry barriers at *all* levels of activity, provides the means of realistically testing the net value (or cost) of economic regulation.

The paper is organized as follows. The following section examines the forces that affect the competitive process in the electricity

³See Joe E. Pace and John H. Landon, "Introducing Competition into the Electric Utility Industry: An Economic Appraisal," *Energy Law Journal* 3 (1982): 1-65; also see James F. Fairman and John C. Scott, "Transmission, Power Pools, and Competition in the Electric Utility Industry," *Hastings Law Journal* 28 (May 1977): 1159-1207.

⁴Irwin M. Stelzer, "Electric Utilities—Next Stop for Deregulators?" *Regulation* 6 (July/August 1982): 30.

industry. Next, proposals for partial deregulation are analyzed. Last, a proposal for attaining complete deregulation—the emergence of an open, competitive electricity industry—is described.

The Competitive Process in Electricity

The Natural Monopoly Argument

The traditional basis for electric utility regulation is the natural monopoly argument. In a natural monopoly, the cost of service would rise dramatically if duplicative services were operating. “The principle source of this tendency (toward economies of scale) is the necessity of making a large investment merely in order to be in a position to serve customers on demand.”⁵

Standard doctrine is that the long-lived, highly specialized assets involved with local transmission and long-distance distribution of electricity embody the characteristics of natural monopoly. Either by building a larger initial system or by increasing the capacity of an existing system, a single distributor could provide additional service at much lower cost per unit of output than a number of firms. Although the matter of natural monopoly in distribution and transmission cannot be easily settled by examining historical records,⁶ it can be assumed for the exposition in this paper that direct rivalry for most electricity markets would be uncommon, even without regulatory restrictions. Public utility law that allows only a single franchised supplier supposedly prevents an entrant from destroying the existing firm as well as itself.

Even if the claims of substantial scale economies in both the transmission and local distribution of electricity are correct, this does little to explain the nature of the perceived “public utility problem”: a dearth of direct competition and, consequently, significant market power over consumers by suppliers. As Harold Demsetz has pointed out, the existence of a natural monopoly is irrelevant to a determination of the number of rival bidders for that monopoly. In other words, if a number of potential suppliers has access to the key strategic assets, bidding for a franchise (bidding for the field) might occur

⁵Alfred E. Kahn, *The Economics of Regulation: Principles and Institutions*, Vol. 2 (New York: John Wiley & Sons, 1971), p. 119.

⁶In the late 19th century, the practice of openly allowing operating privileges among electricity utilities was widely discontinued. A number of investigations were undertaken in the early 20th century, the aim of which was to show that “. . . competition did not achieve its purpose.” These appear to be little more than ex post justifications for entry barriers. See Burton N. Behling, “Competition and Monopoly in Public Utility Industries,” *University of Illinois Bulletin* 35 (August 1983): 21.

and market power would be constrained by the forces of competition.⁷ The form of competition suggested by Demsetz is not an open market process because, invariably, a government agent is called upon to decide the winning franchisee, forceably excluding other participants from later entry. Further, the application to areas where service is already established could be made only by first removing ownership from the current supplier. Last, in the electricity industry, there would remain critical transaction problems with the contract winner, and later opportunistic behavior could reduce the effectiveness of "bidding for the field."

Although Demsetz's proposal may not be a direct means of injecting competition into the electric utility industry, his major contribution was to expand our understanding of market process in sectors where few competitors exist at any given time. Immediate competition may be limited, but competitive behavior can be stimulated by potential alterations in the ownership structure of the industry. We cannot appraise the competitive prospects for the electricity industry by considering behaviors of participants given an existing ownership pattern. Instead, we must analyze *potential* organizational configurations to be able to foretell how overwhelming a single supplier might be. Thus, the standard monopoly argument that a single supplier has no supply-side constraints is open to question.

Entry and Vertical Integration

As long as there are no government restrictions on entry or exit from the electricity industry, we may expect some long-run, "structural" strategies to constrain the behavior of a single supplier, even if the conditions of natural monopoly hold. These strategies require the ability of market participants to rearrange the pattern of ownership and to enter (or leave) the industry freely, using the most efficient organizational form. Unfortunately, the electric utility industry provides few clues on the nature or strength of this kind of competition because the entry and exit conditions have been firmly controlled by government. Typically, one firm is franchised to sell in a territory, and the building of transmission and distribution systems is subject to legal certification and the selective granting of eminent domain powers.

For entry to be a powerful constraint on suppliers, an entrant must be able to organize his operation and arrange his asset holdings in an efficient manner. It is noteworthy that most electric utilities are

⁷Harold Demsetz, "Why Regulate Utilities?" *Journal of Law and Economics* 11 (April 1968): 55-56.

integrated through all stages of production, although vertical integration may not be the result of direct economies of scale.⁸ Many industry observers have denied any value to vertical integration. A typical perception is: "Utilities strive to integrate forward to obtain the security of a guaranteed outlet for their product and backward for a dependable supply of bulk power. But vertical integration does not significantly reduce the cost of operation at any stage of the industry."⁹ Based on this view, the separation of ownership of the stages of production will not increase costs.

Is vertical integration an efficient organizational form? The answer to this question will provide insights into the necessary conditions for furthering competition in the industry. If we accept the presumption of few direct economies,¹⁰ the prevalence of vertical integration in the electricity industry will require another rationale. It can be explained by a simple example. Assume a particular transmission channel is necessary to move electricity from a single producer at point A to consumers grouped at point B. Like a river, the transmission channel involves the use of assets that, once in place, would be very costly to move or duplicate.¹¹ The firm owning the transmission corridor controls long-lived, highly specialized assets that perform an inflexible activity, that of moving electricity between points A and B.¹² Concurrently, the users of this service, the producer at A and

⁸"While no study has been made of the economies of vertical integration between generation-transmission companies and distribution utilities, it is difficult to envision many direct economies. . . ." Leonard W. Weiss, "Antitrust in the Electric Power Industry," in *Promoting Competition in Regulated Markets*, ed. Almarin Phillips (Washington, D.C.: Brookings Institution, 1976), p. 156.

⁹Cohen, p. 1524.

¹⁰Most policy writings on electric utilities simply brush aside the thought of economies from vertical integration, although there is no empirical evidence to my knowledge. For example, see James E. Meeks, "Concentration in the Electric Power Industry: The Impact of Antitrust Policy," *Columbia Law Review* 72 (1972): 76.

¹¹An electricity transmission system is quite unlike a river in many ways. The flow is determined largely by the physical and electrical characteristics across the entire system. While this difference from traffic flow on a river is important in considering control problems, the use of this analogy is still appropriate for understanding the basic contractual relationships. See W. S. White, Jr., "A Closer Look at Electric Utility Deregulation," *Public Utilities Fortnightly* 109 (January 1982): 19-23.

¹²An issue in building a transmission corridor is the task of assembling the numerous private property rights over which the transmission lines will run. Historically, this problem has been simplified for the utilities by the use of eminent domain law to take private property. The right is invariably given to one supplier per territory. This paper does not evaluate the important issue of how this legal device alters the industry. The reform suggested later in the paper is predicated upon use of eminent domain by no party. For an interesting economic evaluation, see Patricia Munch, "An Economic Analysis of Eminent Domain," *Journal of Political Economy* 84 (June 1976): 473-97.

consumers at B, will be performing activities that are highly specialized to this particular transmission system's service; options for delivery may be nonexistent in the present, and extremely costly to develop. Opening another channel, once one is moving electricity between points A and B, is as unlikely to occur as the opening of a canal parallel to an existing navigable river.

The transmission system forms a "bottleneck" that users cannot evade at low cost. The market power of the transmission system owner is clear. He may extract, in the short run, large quasi-rents equal to the valuation for the service to his users less his operating costs. Over time, these rents will be dissipated in two ways. Entry may occur, enticed by large economic profits from transmission, driving the return on investment to a normal profit rate. On the other hand, if there are no entry possibilities (by substitution in either transmission or end use), the rents would become capitalized into the transmission system's asset value.

The point here, however, is not that market power is embodied in the ownership of the transmission system, but that the market power is subject to much volatility over time. Pricing possibilities will fluctuate directly with the very limited number of demands placed on the system. With a very specialized asset, variations in valuation come from a very small user population; consequently, bargaining power and pricing possibilities can be dramatically altered. For example, the emergence of a new user, whose valuation for the complete transmission services exceeds that of producer A, could cause producer A to lose his complete market. Of course, efficiency is served by reallocation of resources to their highest incremental valuations. But if the problem (how to enter the electricity industry most efficiently) is considered from the long run, then these transaction risks become an important economic cost factor that rational agents will attempt to reduce.

Long-term contracts are a means of reducing the transaction risk, but as the sole basis of service they may not effectively deal with the problem. Long-term contracts are costly to administer and enforce, and there are numerous ways for either party to alter price (or service characteristics) in an opportunistic attempt to gain. This is particularly troublesome if demand or technology are altered considerably after the contract signing. Regardless of the details of any contract, producers or consumers, given the opportunity to gain, have the incentive to search for the means to evade a contract's terms, even in a "regulatory" contract.¹³

¹³See Oliver Williamson, "Franchise Bidding for Natural Monopolies—in General and with Respect to CATV," *Bell Journal of Economics* 7 (Spring 1976): 73–104. For a view of regulation as a form of contract, see Victor P. Goldberg, "Toward an Expanded Theory of Contracts," *Journal of Economic Issues* 10 (March 1976): 45–61.

Strong incentives exist to provide a structure of exchanges that economizes on transaction costs.¹⁴ An entrant in the electricity industry would be well aware of the transaction risks caused by the large "sunk" investment in transmission assets that are both durable and specialized in use.¹⁵ On the other hand, the electricity industry does not present a picture of complete immobility of assets used in generation and transmission. Clearly, these two stages may muster options that reduce the ongoing transaction (market-power) problem. But given the sparse evidence of other cost advantages, transaction risk avoidance may be a principal cause of the vertical integration that spans the generation, transmission, and distribution stages.

Note, however, that as the transaction problem afflicts upstream transactions, it is also quite evident at the consumer level. Why has there been no integration here too, bringing the final transaction into the vertically integrated firm? Clearly, the institution of public utility regulation has been developed with the intention of dealing with this market-power question. Whether it efficiently fulfills that function is a question that cannot be directly answered because of the legal exclusion of alternative organizational forms that might compete with regulation. If consumers (or their organizations) could build or acquire distribution and transmission channels back to alternate producers (or generate themselves), they might reduce greatly a single supplier's market power. Entry restrictions placed on the electricity market to reduce "wasteful duplication" are quite wrong-headed if a threat of entry is the least costly means of constraining the market power of the existing supplier.¹⁶ Resources rationally committed to increasing industry capacity in order to reduce market power may not be wasted, but rather may support productive activity.¹⁷

Natural monopoly is the economic basis for public utility regulation practiced in all electricity markets in the United States. However, natural monopoly does not imply that there cannot be strong competitive pressure. Competition in this industry, given current technologies, is greatly dependent upon the ability of market

¹⁴See Oliver Williamson, "The Modern Corporation: Origins, Evolution Attributes," *Journal of Economic Literature* 19 (1981): 1537-70.

¹⁵Benjamin Klein, Robert G. Crawford, and Armen A. Alchian, "Vertical Integration, Appropriable Rents, and the Competitive Contracting Process," *Journal of Law and Economics* 21 (1978): 297-325. Economists Klein, Crawford, and Alchian have suggested that such transaction risk has led to joint ownership of oil pipelines by integrated producers-refiners to remove the market-power threat at both ends of the pipeline.

¹⁶Elizabeth E. Bailey, "Contestability and the Design of Regulatory and Antitrust Policy," *American Economic Review* 71 (May 1981): 178-83.

¹⁷See James M. Buchanan, "Rent Seeking and Profit Seeking," in *Toward a Theory of the Rent-Seeking Society*, ed. James M. Buchanan, Robert D. Tollison, and Gordon Tullock (College Station: Texas A&M University Press, 1980), pp. 3-15.

participants to rearrange ownership and the structure of the market itself. These tasks are “long run” in nature. Vertical integration may be a highly efficient organizational structure in the electricity industry, given the risks incurred in market transactions; thus, entry restrictions at any industry stage may greatly reduce efficiency and consequently hinder the competitive process in the electricity industry. This argument, as will be discussed in the next section, is in direct conflict with the typical deregulationist proposal for the industry that calls for vertical *divestitures* between the generation and transmission stages, and provides no opportunity for integration in which consumers are voluntarily involved.

Proposals for Deregulation and Divestiture

A number of visions of competition in the electric utility industry have moved through the public policy arena in the last few decades. Few industry analysts have considered direct competition for retail customers to be a reasonable option. While there is some direct competition in the United States between municipal and privately owned firms, direct competition would probably be uncommon in an unregulated marketplace.¹⁸ On the other hand, wholesale competition among generating firms for industrial or local distribution system customers is seen as more likely to occur and has received widespread support as a realistic policy objective. It is argued that, in the generation stage, cost reductions from increases in output are no longer significant over a broad range of firm sizes; thus efficient generating firms, of smaller plant size than the largest currently in operation, could prosper.

Divestiture deregulation proposals promise the removal of certain instruments of economic regulation, especially lifting rate regulation from the generating firms in the industry. There are numerous proposals to deregulate the generation stage of the electricity industry,¹⁹

¹⁸Walter Primeaux is one of the few researchers to argue that direct, head-to-head rivalry could be a strong competitive force in some electricity markets. See Walter J. Primeaux, “The Monopoly Market in Electric Utilities,” in *Promoting Competition in Regulated Markets*, ed. Almarin Phillips (Washington, D.C.: Brookings Institution, 1975), pp. 175–200. Also see Jan Bellamy, “2 Utilities are Better Than One,” *Reason* 13 (October 1981): 23–30. Other forms of electricity competition include competition for fringe territories, “yardstick” competition (comparing performance of privately owned utilities with that of similar public utilities), and competition for new industrial plant locations. Most analysts view these as helpful, but rarely significant, in limiting the market power of an integrated utility.

¹⁹Because the purpose of this section is only to examine the major common features of these divestiture reforms, no attempt is made to provide insight into the unique features of any of the proposals.

but all have five common elements: (1) severing the vertical integration in ownership of the generation, transmission and distribution stages; (2) removing rate regulation from the generating firms' sales; (3) removing entry barriers in the generation stage; (4) creating a separately owned, regional transmission system (a government owned or franchised monopoly) that has an obligation to coordinate operations and planning in the region, and sell electricity on a cost-plus basis or act as a broker between generating firms and distributors; and (5) applying continued economic regulation (or government ownership) to local distribution systems, with no direct competition allowed for retail customers.

In sum, the kind of market that most industry observers expect can be competitive involves bulk transactions between independent generation companies and wholesales.²⁰ Much of the literature advocating more competition in the electricity industry, therefore, has suggested legal reforms to improve access to other sources of power for local independent distributors and wholesale consumers without substantially altering the industry's ownership structure. To these reformists, rivalry can be spurred by strengthening the requirements for wheeling (the use of an intervening utility's transmission lines to bring power from a remote supplier to a wholesaler customer), and actively using antitrust laws to ensure nondiscriminatory treatment of independent distributors and access to an "assured" supply of electricity. But to divestiture deregulationists, promoting competition requires more drastic measures, in particular, the disintegration of generation and transmission functions.

Evaluating Divestiture Deregulation

Deregulationists include as part of their plans the separation in ownership of generation and transmission functions. They argue that transmission, unlike generation of electricity, will remain a natural monopoly. If multiple, independent generating firms were separated from numerous wholesale markets by a transmission monopolist, then an unregulated market would still provide few of the fruits of competition. The transmission system owner (who is also one among many generating firms) would effectively extract monopoly

²⁰Most observers recognize long-term contractual sales as the primary form of transaction. However, a model, frequently called the "MIT model," relies instead on spot market sales in bulk power in which marginal-cost pricing principles are applied to bring generation on line at the lowest feasible cost. See Roger E. Bohn, Richard D. Tabors, Bennett W. Golub, and Fred C. Schweppe, "Deregulating the Electric Utility Industry," MIT Energy Laboratory Technical Report No. MIT-EL82-003 (January 1982).

prices from its *generation-level competitors*. But divestiture of the transmission system would not, of itself, resolve the monopoly difficulty because an independent transmission company could also employ numerous tactics to force concessions from generating firms or wholesale customers. Therefore, according to these proposals, whoever owns the transmission grids (unless it is a government agency) must be severely constrained in service and price activities, treated generally as a common carrier. Since divestiture deregulationists see no significant cost saving attached to ownership of both generation and transmission assets, divestiture is a logical step, removing monopolistic enticements from all the generating-stage firms.

There are a number of attractive results suggested by divestiture deregulation. First, numerous independent generating firms could compete, and their sales of electricity would not require an onerous overlay of rate regulation as contractual (and possibly spot) wholesale market competition emerged. Continued rate regulation presently is seen as damaging to the financial stability of the utilities and their capability of meeting future consumer demands.²¹ Second, direct costs of administering regulatory commissions could be reduced. Third, entrepreneurial behavior, motivated by an unrestricted profit function, would improve resource allocation efficiency. Last, greater technological innovation may result from a more competitive environment.

Unfortunately, *deregulation-by-divestiture* suffers from a number of serious deficiencies on its journey to greater competition.²² When separated from generation ownership, the transmission system in most deregulation proposals plays a very powerful role in coordinating the operation and planning of the regional industry. These grids would span large geographic territories and provide much the same kinds of services that power pools now play; the transmission company would act as a means of *horizontal integration for the industry*. But detailed coordination among large integrated utilities today is frequently thwarted by self-interest conflicts among pool partici-

²¹See Paul W. MacAvoy, *The Regulated Industries and the Economy* (New York: Norton, 1979), chaps. 1 and 2.

²²The severing of transmission system assets from the generation assets of currently integrated utilities presents a host of legal questions and would invariably cause a number of transitional costs. These important issues have been addressed elsewhere and are disregarded in the text discussion. See A. Joseph Dowd and John R. Burton, "Deregulation Is Not an Answer for Electric Utilities," *Public Utilities Fortnightly* 110 (September 1982): 21-8.

pants,²³ and numerous independent generating companies may behave opportunistically as well. For example, the transmission grid coordinator in many proposals would assist in assuring that "adequate" capacity was available in its region. Detailed knowledge of existing and planned capacity would be requested of each generating firm. But some of these firms may perceive their self-interest to be served by exaggerating capacity plans in an effort to inhibit competitors' capacity expansion. Ironically, strong attempts by the transmission system coordinator to "rationalize" operations and planning among the independent generating firms (possibly supported by legal reporting requirements) would cut directly against the avowed purpose of the deregulation itself—to instill a competitive, entrepreneurial spirit in the generating segment of the industry.

If we assume that coordination among many generating units, across a large, complex transmission system is a cost-saving activity, then the industry may, without government interference, evolve into a more horizontally integrated structure. This possibility is noted as a source of cost savings by some deregulation supporters, but they reject horizontal integration because it also reduces the potential for desired wholesale competition. In fact, some proposals call for the breaking up of the generating plant holdings of larger utilities so that there will be a number of potential competitors. Although voluntary horizontal agreements could be used as a collusive, competition-foreclosing strategy, they also may produce more cost-effective means of organizing and planning than a transmission company's legally imposed planning regime.

A reduction in rate regulation is a purported benefit of divestiture deregulation, but this reduction may not occur. The problem of market power remains in sales by individual distribution systems;²⁴ therefore, rate regulation of private distributors' sales is included in all divestiture proposals. The newly formed independent transmission company (if a common carrier) must also be subjected to continual rate and quality-of-service review. Further, there is the possibility that the regulators at the retail level will not passively accept contractual energy purchases by the distributor as an uncontestable cost. For example, in a period of escalating electricity supply costs, similar

²³Philip Fanara, Jr., James E. Suelflow, and Roman A. Draba, "Energy and Competition: The Saga of Electric Power," *The Antitrust Bulletin* (Spring 1980), p. 130.

²⁴Divestiture proposals also present a problem in commission jurisdiction. The transmission system could be regulated by either the Federal Energy Regulatory Commission (FERC) or some newly formed regional regulatory system, with distribution systems remaining under state commission control. We can expect controlling commissions to resist efforts to curb their authority.

to that experienced in the mid-1970s, local regulators may call into question the basis of distributor contracts with the generating firms. The political outcry by state commissions against "take or pay" natural gas contracts between producers and gas pipelines serves as a case in point. Divestiture deregulation schemes may not reduce the burden of direct economic regulation from the electricity industry, but rather may *compound* the transactions under continual commission appraisal.

Finally, after the disintegration of vertically integrated utilities is carried out, we are left to consider *how* the freestanding generating companies will compete. A large transmission system can encompass numerous plants, but many now are jointly owned by a mix of integrated private utilities and independent public and cooperative distribution systems, a trend viewed by some reformists as reducing the potential for wholesale competition.²⁵ New capacity would probably be made available only through contractual commitments for output over the life of a generating plant; this, of course, is a form of vertical integration. Without such promises, the industry currently finds the installation of new capacity very costly because of premiums required by potential investors for taking demand-side risks. If divestiture left untouched the existing contractual arrangements for capacity, then the bulk-power competition may occur only for long-term contracts on future capacity among few market participants.

Summing up, there are serious questions about the efficiency of competition among generating firms formed by divestiture deregulation and the degree to which the regulatory burden on the industry could be reduced. A practical view may seem to be that a little deregulation is better than none at all. However, in this industry a little deregulation may greatly increase regulatory complexity and reduce organizational efficiencies. One cannot consider a proposal that disallows competitors (and entrants) the use of efficient organizational forms as an enhancement of the competition process. A little deregulation could be worse than none at all.

Creating an Open Market in Electricity

It is helpful, at this point, to outline three salient features of competition in the electricity market. First, whoever controls transmission and distribution has considerable market power in the industry. This is due, given current technology, to the massive sunk cost commitment in user-specialized transmission and distribution assets that

²⁵Fanara, Suellflow, and Draba, p. 138.

must be made to compete. This condition provides a strong incentive for vertical integration. Today, virtually all privately owned utilities are vertically integrated. Direct competitors, at any given time, will be few. Thus, in an open market, direct competition generally would occur among *vertically integrated* firms.

Second, although market-transaction problems can be reduced by vertical integration (for the integrating parties), unless consumers are able to obtain ownership of the integrated system, they will remain susceptible to the integrated supplier's market power. Vertical integration backward from users, either by purchase of an existing utility's transmission and distribution lines or by addition of new capacity, may be an effective competitive strategy. Competitive pressures could be placed on existing suppliers through these entry threats. Rural electric cooperatives (outgrowths of the Rural Electrification Administration's mandate to extend electricity distribution in rural areas during the 1930s) provide examples of user-controlled organizations that frequently have organized jointly to acquire transmission and generation capacity. These generation and transmission ventures (G&Ts), owned and operated by member cooperatives, provide a substantial long-term source of power to member co-ops.²⁶

Third, horizontal integration is currently extensive at the generation level through both ownership and pooling agreements. There may be cost advantages to further integration. In particular, the coordination of operations and planning may be facilitated by further voluntary horizontal integration.

Critics of electricity industry performance have identified economic regulation as the chief culprit in producing numerous ills (e.g., regulatory lag, resource misallocations, and loss of incentive to innovate). Nevertheless, regulation continues largely because of its supposed protection of consumers from suppliers' market power. But regulation is not the only feasible institutional form that may provide protection, nor is it voluntarily selected by those it is intended to shield. It may be that the costs of regulation are greater than the benefits so that a private organizational form would be a superior way to protect consumers. Testing this proposition, however, is not currently possible because private institutional options are not present. The following four suggestions would provide the missing market choices in the electricity industry:

²⁶REA co-ops generated approximately 42 percent of their own power in 1982 and are briskly expanding that capacity. U.S. Department of Agriculture, Rural Electrification Administration, *44th Annual Report of Energy Purchased by REA Borrowers* (Washington, D.C.: Rural Electrification Administration, 1983).

1. Remove all entry barriers to the generation, transmission, and distribution stages. Neither the granting of franchise to a single firm nor the selective granting of the power of *eminent domain* would be permitted.
2. Discontinue the use of antitrust and other policies as a means of forcing integrated electricity firms to “wheel” electricity.
3. Remove all subsidies and tax concessions to public power systems and cooperatives.
4. Provide each consumer with an option that when signed would release that individual’s transactions with any electricity supplier from future regulatory control. Consumers also would be allowed to assign the “market-entry” options to utilities (or any other agent). Once an option is signed, by whoever has the assigned authority, reintroduction of rate regulation would not be permitted.

These policies would greatly alter the structure of incentives in the electricity industry. Consumers choosing to use their options would be exposed to market risks previously masked by economic regulation. These same consumers, however, would have considerable flexibility to search for a better deal than under economic regulation. The market risks are faced *only* when the option has been voluntarily exercised by a consumer. Each of the above points will be discussed briefly.

Entry Barriers

In contrast to reforms calling for competition only in the generation of electricity, our proposal is based on the assumption that all stages must be open to entry for a competitive process to proceed. Indeed, without achieving open entry across the board, it is likely that no form of competition will be particularly successful. If vertical integration is efficient, reducing transactions risks, then reforms that divest transmission systems from generation plants will increase costs. These reforms also place a heavy regulatory burden on the interface between the severed stages, because incentives still exist for the separate firms to perform as a vertical entity. The task of monitoring the behavior of these firms could be quite costly.

If entry is completely open, the decision to construct or purchase transmission and distribution system assets would be left in private hands. Enfranchisement in any form would not be used as a means of excluding or conditioning entry; all firms would have similar opportunities to serve any markets they care to enter. Although direct duplicative entry may be unusual, the possibility that new firms may

acquire existing assets acts to constrain integrated suppliers, especially in serving large-volume, dense markets.

Without the power of eminent domain, new transmission and distribution lines may be more costly to construct because of the numerous adjoining property rights that must be acquired. But it is not an impossible task. For example, the use of options contracts is a means of maintaining competitive pressure during negotiation. Removing eminent domain authority would lead to a market test of the value of the property rights, eliminating the implicit subsidy provided to any utility using it.²⁷

Forced Access

The heart of most nondivestiture reforms of the electricity industry is the requirement that the owner of a transmission corridor provide "transport" (wheel) electricity across that corridor for outside parties. "Nondiscriminatory" access, based on marginal-cost pricing principles, may appear to move the industry past the bottleneck problem without causing inefficiencies in resource use. Mandated contract carriage has been proposed in other transport industries as the essential means of overcoming the bottleneck problem and increasing competition.²⁸

There are a number of reasons to expect that the cost of forced access would not be low in the electricity industry. The major problem with wheeling is the dilution of control it implies: Resource allocation decisions may not be made on the basis of the highest expected value of service. The weaker transmission system ownership rights become, the closer wheeling proposals come to the complete loss of property rights under vertical divestiture. Further, oper-

²⁷See Munch, p. 495. There is some evidence that the use of eminent domain distorts the cost of assembly and leads to an inefficient allocation of the subsidized activity. Another question of property rights concerns the ownership of existing distribution and transmission systems that have been built using eminent domain. Argument for contract carriage or forced wheeling of electricity may appeal to the notion that the ownership of delivery systems reflects, in part, the past application of coercive government powers to reallocate resources to the utilities. Whatever the merits of this assertion, there are problems with forced "sharing" of transmission systems; in particular, dilution of ownership control reduces the incentive to use the assets efficiently. It may be feasible, however, to devise means by which some portion of a transmission corridor's physical space (not existing assets placed in the corridors by the current supplier) could be taken from the owning utility and auctioned to private parties.

²⁸In natural gas transport, a suggested solution "... is to provide open access to natural gas transportation facilities—to mandate contract carriage. The concept of contract carriage is simple. Natural gas transporters could be required to carry natural gas for others on a space-available basis." Nolan E. Clark and Glenn Willett Clark, "The Way to Deregulate Natural Gas," *Wall Street Journal*, 4 May 1983, p. 24.

ating a transmission system is a complex problem when physical and electrical characteristics across the entire system are interrelated. A capacity problem at one point of the system is a capacity problem across the system, unlike the cases of transport and pipeline technologies. Thus, the requirement to carry others' loads may reduce the reliability of the system. Finally, if access decisions were made or reviewed by political agencies, the efficiency sought by the economist-reformer would be balanced by numerous "equity" issues. It is likely that access would be based on legal formulations that only partly respond to economic issues. Opportunistic participants may use the mandated wheeling requirement as a means to cause misallocations in the existing delivery system and in the development of future delivery systems.

Subsidies and Taxes

The claim of investor-owned utilities that municipal and cooperative electric utilities compete unfairly is justified.²⁹ The development of an open market in electricity should proceed on the premise that all forms of ownership receive the same treatment with respect to access to federal energy, the cost of financing, and taxation. If cooperatives are an efficient organizational form, this must be demonstrated under the same conditions that private, investor-owned utilities face. All subsidies should be removed. In particular, the legally stipulated preference given to municipal and cooperative utilities in acquiring federally produced electricity should be eliminated, and market pricing of that electricity initiated.

Market Options

Individual consumers, whose suppliers are currently operating under franchise agreements (with transactions subject to state or federal price regulation), would receive market options.³⁰ When exercised, the option would release from further public utility regulation

²⁹Both cooperative and nonfederal public systems enjoy advantages that the investor-owned utilities do not. The Rural Electrification Administration continues to guarantee loan rates below the cost of capital through the Federal Financing Bank. Municipal and state power authorities can also obtain financing below the cost to a private utility by issuing bonds with tax exemption on interest. Both cooperatives and nonfederal public systems are exempt from federal income tax and most state income taxes. All six federal power-producing agencies give preference to public utilities and cooperatives in the sale of electricity.

³⁰This may be accomplished by state legislation, but, given the considerable role of FERC in economic regulation activities, federal law would be more effective. Federal legislation also would reduce problems of differential treatment of one utility serving customers in more than one state.

all transactions for service between that particular consumer and any electricity supplier. Unsigned options could be assigned to any other party and reassigned without restriction. Information about exercised options would be a matter of public record. Once legally released from economic regulation, public utility commissions would have no further control over transactions—including pricing, service reliability, safety, and conditions of sale—involving that consumer. Instead, the relationship of buyer and seller would have to be reestablished contractually; new contracts formed would be enforced through the judicial system as any other private contract is.

Consumers and utilities may devise a number of ways to use options. For example, some consumers may decide to retain public utility regulation by holding the unsigned market options. Because these could later be signed, the consumers' supplier and the regulatory commission have an incentive to perform well, recognizing that a potential market threat exists to the regulatory regime. A regulated utility may desire the assurance of retaining commission regulation; thus, it may seek to acquire consumers' options and then hold them so that consumers would remain bound to the regulatory process. Such a supplier would still have the opportunity of later exercising the option if he finds regulation undesirable. A consumer also may decide to sell the rights to the options to an outside supplier or may assign them to an agent to be used in a manner specified by agreement.

The market option provides some attractive features. First, consumers can retain the customary institutional protection if they so desire; the option to end rate regulation does not have to be exercised. Second, the incentive to deregulate is neither legal coercion (such as divestiture or forced wheeling) nor subsidy. Instead, the difference in expected value of a market-determined allocation system over economic regulation is discoverable by individuals, and this net value is used to motivate the voluntary selection of institutional form. Resources that otherwise would be committed to market entry (e.g., construction of a competing distribution and transmission system) can be reduced. Further, the option (with positive value) increases the number of market participants searching for the private means to supplant rate regulation. Because the option value represents the opportunity cost of continued rate regulation, the device serves to enhance efficiency. We would have a market test of the value of rate regulation.

Whether the market-option system will greatly improve the consumer's position depends upon the asset value of the option. That value, in turn, depends upon the alternatives to public utility regulation that can be achieved in an open market. Note that the supplier

has no power to decide if market options are to be used, and entry into all phases of the industry would be allowed. Therefore, the value to the supplier of continuing with a regulatory commission may diminish if a relatively large number of consumers exercise their options for deregulation. This would occur if consumers selected other suppliers, or, as discussed below, formed user organizations to initiate market entry. The current supplier would then face the dilemma of negotiating with his current customers in anticipation of competitive threats, or ignoring the market options and rapidly losing his share of the market.

But if the supplier perceives no potential market threat, he would be unwilling to attempt to purchase the options or to bargain with customers. A consumer who similarly sees no realistic alternatives to his current supplier would be unwilling to release that supplier from commission regulation. In this case, public utility regulation continues, with one major difference: Consumers have agreed to accept the regulatory arrangement. They have accepted a "regulatory contract"³¹ that did not exist previously. Although the regulated suppliers appear to be coerced into the regulatory arrangement, they do have the right to voluntarily bind themselves to the regulatory process by acquiring the options and not using them. In the latter case, the public utility commission would seem to represent both supplier and consumer, essentially arbitrating differences according to statute law and procedural requirements.

Unfortunately, the typical commission hardly operates as an arbitrator of two-party squabbles; instead, the commission is open to numerous other interest pressures, making a two-party conflict into a multiparty redistributive game. For the public utility commission to become an independent arbitration body, the "rules of the game" must be disassociated from the political arena and placed into contract law. Critical to this transformation is the voluntary surrendering of some authority to an arbitration agent by both supplier and consumer.

The change can occur, but not by deliberately attempting to modify the existing institutional arrangements of public utility law. Instead, the market-option concept may lead to private market institutions that have arbitration features. For example, many users, served by a single electricity supplier, may decide to forego public utility regulation and form long-term contracts with their supplier. The necessity

³¹Goldberg (1976) argues that economic regulation acts as an implicit, relational contract between consumer and commission (which then acts as the consumer's agent). This view does not seem consistent with the lack of individual consumer acceptance of a regulatory contract.

of efficiently addressing contract difficulties across numerous and uncertain circumstances is a major reason for developing a mechanism to moderate such risks; the consumer may sensibly bargain for an arbitration body as a feature of any long-term contract. Because the costs of separate negotiations by many small users is great, user coalitions may form. A coalition's representative would have power to negotiate contracts, using the bundle of market options for all within the group. The exercising of the market options held by the group would be a necessary precondition for entering a new contract. A supplier may be willing to accept a contract with arbitration features to avoid the continuing hazards of public utility regulation. Thus, market options could act as an incentive to turn toward private institutions that will supplant many of the functions of the public utility regulation, while eliminating political intervention.

The packaging of market options by consumer coalitions may greatly reduce the costs of negotiating with a supplier. If the supplier perceives no likely alternative to his services, the power of the coalition may be weak, based only upon the perceived savings to the supplier of the private arrangement over public utility regulation. But a user coalition can do more: It may be possible for users to enter the market by vertically integrating backward, through the distribution and transmission system, to the generation stage. When the potential exists for an efficient entry of this kind, considerable pressure can be applied to a supplier. Such a user group, or cooperative, would function much like a club whose members share a public good—in this case, the reduced threat of market power resulting from joint action.³² An integrated user cooperative is efficient to the extent that it can perform the function of reducing market-power threats better than alternative organizational forms. User organizations do not have to acquire physical assets to be useful in countering market power. The management of a user group (holding unsigned market options) would continually search for alternatives to the existing regulatory arrangements and would have the potential to engage another supplier or to enter the market itself. This posture can produce a significant threat to an existing supplier.

Consumers within such a cooperative generally would be similar in electricity-use characteristics. Heterogeneity would undoubtedly lead to dissention. For example, a large industrial user may strongly desire a time-of-day rate structure that may counter the interests of the typical household consumer. Such conflicts are resolved, in part,

³²See Todd Sandler and John T. Tschirhart, "The Economic Theory of Clubs: An Evaluative Survey," *Journal of Economic Literature* 18 (December 1980): 1481–1521.

by the exercising of one's right to enter (or not enter) any cooperative; more than one cooperative may operate within a given geographical area.

For a user cooperative that makes few asset acquisitions, outside funding may be unnecessary or very limited; entry should be relatively easy. But for the cooperative that attempts to integrate backward into the industry, a more difficult task of financing asset acquisition is presented. Obtaining funding by extending ownership is inadvisable because the organization's objective of reducing users' exposure to market power would be jeopardized. Clearly, only those who are users would share this objective. With ownership restricted only to users, the organization then is limited to debt financing, and the cost of capital may be much higher. Further, considerable asset-pricing risks are placed on the owner-consumer. Another difficulty is that the internal control of a cooperative may be especially difficult because an individual owner holds only a small share of the total ownership. Developing owner coalitions to challenge existing management of the cooperative may therefore be quite costly.

These and other difficulties associated with financing and operating a user cooperative decrease the value derived from backward vertical integration as a means of reducing the supplier's market power.³³ The aggressive backward integration of rural electric cooperatives (RECs) is suggestive of how private user cooperatives may perform in the future. However, because the RECs are highly subsidized, there is no assurance that truly private user-acquisition ventures would be efficient.³⁴ Fortunately, to be effective, it may not be necessary for a user cooperative to integrate far backward, if at all, in an open market. First, the cooperative holds the rights to an unregulated marketplace as a bargaining piece in negotiating supply contracts. That alone may make the asset value of a large collection of options quite substantial. Second, the market options could be used to entice an "outside" supplier to provide the transmission and dis-

³³Richard B. Heflebower, *Cooperatives and Mutuals in the Market System* (Madison: University of Wisconsin Press, 1980), chaps. 1-3.

³⁴The recent financial difficulties of the Washington Public Power Supply System, nicknamed "Whoops," suggest that the combination of financial subsidization and allegiance to a federal energy supply is no guarantee of success. In the early 1970s, with the backing of the Bonneville Power Administration, 138 participating utilities (mostly cooperatives and municipals) planned the addition of five nuclear reactors to supplement what was expected to be tight capacity in the coming decade. Only one of the plants may now be completed, with the rest being either shelved or scrapped. "Whoops" has over \$2 billion of debt on which it will default. See David L. Shapiro, "Whoops and the Hodel Connection," *Wall Street Journal*, 20 May 1983, p. 24.

tribution system linkages to a specific group of users.³⁵ Third, a user group may form that does nothing except hold the unsigned market options of its members. While retaining traditional regulatory protection, users hold open the possibility of eventual market entry.

No precise judgment can be made on what consumers would do; perhaps a number of different strategies would be employed. In all cases, the risks imposed on consumers using market options must be *voluntarily* accepted. But what of the consumers who do not wish to leave the regulated environment; does market entry weaken the feasible protection of the public utility institution? Although the answer to this question is "yes," a more important question is: Under what conditions should the relative merits of alternative institutions be debated? The true value of regulation cannot be known unless there are private (competing) alternatives. If opening these market alternatives reduces the value of public utility regulation, that loss represents a regulatory cost due to the absence of competition.

For example, with market entry allowed, utilities may find themselves negotiating lower prices with their nonregulated customers. These initially would be larger consumers, perhaps industrial firms that have considerable substitution opportunities among energy types or are cogenerators of electricity. The utility then may attempt to recoup its revenue losses by raising rates to regulated customers, providing these consumers with an additional incentive to opt out of the regulatory system. A similar process seems to be occurring in the telephone industry where long-distance telephone prices are not subject to direct rate regulation, but local telephone services are. Higher local access fees are likely to lead to "bypass" of local exchanges, especially by larger consumers.³⁶ Far from being undesirable, "bypass" reflects more accurately the opportunity cost of continuing with rate regulation, costs that can only be known if market alternatives are allowed.

In some ways the market-option plan for deregulating electric utilities is similar to the freedom allowed long-distance telecommunication carriers to develop market relations with consumers, and the freedom allowed consumers to initiate their own long-distance telecommunication programs. Market options could lead to new firms

³⁵This strategy may be even more effective if the user cooperative first acquired the local distribution system for the users.

³⁶Considerable political pressure can arise to halt the revenue leakage from bypass. For example, Senator Robert Packwood has introduced a bill that would place surcharges on any companies that bypass the local telephone exchanges. Undoubtedly, pressure for similar controls would occur as the option plan opened the electricity market to competition.

selling electricity in competition with previously franchised utilities, and possibly some large electricity consumers (either industrial firms or residential/commercial cooperatives) providing for their own service by integrating backwards. The market-option scheme, unlike the partial deregulation in telephone service, can achieve *complete* industry deregulation. The option scheme seeks to avoid the kind of intense political pressures now being exerted on regulators of the remaining local, "natural monopoly" telephone exchanges. The deregulation of half of an interrelated industry provides the impetus for either the reregulation of the free half or the failure of the remaining regulatory institution. A market-option system is designed to avoid such difficulties for the electricity industry.³⁷

Conclusion

Most recent deregulation proposals for the electric utility industry have focused on wholesale competition among independent generating firms. Many proposals are buttressed by suggestions to separate the transmission from the generation function, and place control of large, regional transmission systems under a single firm. The reforms would require a massive, legally coerced redistribution of ownership rights in the resources of the industry. A critical assumption behind these reforms is that forcing market transactions in lieu of intrafirm allocations will provide efficiency gains and stimulate competition.

We have questioned whether this view of competition is truly consistent with a real-world competitive process in electricity. There is a strong theoretical argument that the necessary preconditions for the kind of competition that would be attempted by reformists would not be voluntarily chosen by cost-minimizing firms. Given the transactional risks of market sales across highly specialized, durable transmission and distribution systems, vertical integration generally would be the most efficient organizational form. Given the probable gains of coordination in the operation and planning of transmission and generation systems, further horizontal integration also may be cost-efficient in the industry. If, in an open market, efficient firms would be highly integrated, denial of ownership rights across generation-transmission-distribution functions would retard the competitive process. Forced divestitures, rather than promoting competition, may provide the opposite effect by preventing efficient market entry.

³⁷Although this paper has been limited to analysis of the electricity industry, the market-option concept could be usefully applied to a number of regulated industries undergoing partial deregulation. In particular, the regulation of local telephone service may be gradually eliminated by use of the option scheme.

DEREGULATING ELECTRIC UTILITIES

The electricity industry often leaves the consumer with little short-term protection from the market power of his current supplier. This conclusion, however, does not necessarily require the continuance of economic regulation. This paper has suggested a reform for the industry that relies on the marketplace discovery of the means for protection and gain by individual participants. Ownership transfer or contract formation could be assisted by giving the consumer a market option—the right to opt out of rate regulation—which can be exercised directly or assigned to another party. The use of these options in an open market would provide a realistic test of the value of public utility regulation in the electricity industry. Those who wish no major changes in the industry would make deregulationists prove their assertions of efficiency gains. This paper has suggested the means by which such evidence could be acquired.