

## DON'T RESTRUCTURE ELECTRICITY; DEREGULATE

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Concern over the U.S. electric power industry has produced proposals for massively changing the industry. These alterations are often incorrectly described as deregulation. What actually is advocated is regulator-imposed alterations in the structure of the industry. This paper argues that conventionally defined deregulation, removal of governmental controls, is preferable. The theoretic and practical flaws of regulation preclude efficient imposed restructuring.

The argument stresses the general case against public utility regulation. The drawbacks imply an inability to develop satisfactory responses to any problem. It follows that designing a new structure for the electric power industry is a task at which regulators have been and are likely to continue to be incompetent. The issue, developing a new structure for a complex, regulation-distorted industry, is surely one for which the standard arguments for preferring a decentralized market solution to a centrally imposed one strongly apply.

Although economic theory and experience provide ample and widely recognized reasons to distrust regulation, traditional public utility economists consider regulation so fundamental that they prefer improvement to abandonment. Those who accept regulation are often unclear about whether the preservation of regulation is economically preferable or merely dictated by political feasibility. Feasibility is not an appropriate criterion for economic analysis. Economics actually has stressed determination of the most desirable outcome. The objective is to alter prevailing political views. Moreover, what is possible is certainly not an area in which economists have competence and may be unclear even to those who supposedly possess expertise. Experience with energy suggests that politicians often do not know what they can legislate. What advisers should do is suggest what

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seems best and persuade politicians to convince people that the changes are desirable.

The case for deregulation has three elements. First, note is taken of the arguments and counterarguments prevailing about electric power. Next, the bases for opposing regulation of natural monopoly are sketched. Finally, experience with regulation is examined. Two aspects of practice are stressed. First, the restructuring efforts initiated in the 1930s are recalled to suggest that governments have a bad record in designing an optimal electric power structure. Second, the most egregious examples of the defects of prevailing regulation are noted. Finally, questions are raised about approaches proposed in the restructuring debate.

### Objections to Public Utility Regulation

In theory and practice, three basic reasons exist for objecting to the application of public utility regulation to an industry. As discussed below, only the presence of natural monopoly, the inability of more than one firm profitably to operate, produces a clear concern about industry performance that justifies *consideration* of corrective measures. One objection is that the industry never was a natural monopoly. A second alternative is that the natural monopoly has disappeared due to the growth of the market (Stigler 1951). The third response is that whatever the circumstances, regulation is more likely to worsen than to improve the situation. All three arguments are made about regulated industries including electric power.

The case here considers all three contentions but stresses the third. Assertions that no problems justify regulation are simultaneously analytically trivial and difficult to substantiate at least to the satisfaction of skeptics. Resolution of the nonexistence issues is entirely a factual issue. Long experience warns that interpreting economic reality is often (perhaps almost always) impossible, particularly for complex issues. Assertions that electric power was never a natural monopoly, or no longer is, are viewed skeptically by many commentators. The case against regulating even when a natural monopoly exists relies largely on analytic points buttressed by more clear-cut factual arguments. The analytic case, moreover, seems an interesting one.

### The Existence of Natural Monopoly in Electric Power

The standard argument that electric power was not a natural monopoly stresses the pre-regulatory structure and the advocacy of regulation by one of the key figures in the industry, Samuel Insull. He was the head of both Chicago's Commonwealth Edison and a large, sepa-

rate holding company. The interpretation is of the leader of a competitive industry seeking protection from competition. Such arguments tacitly dispute a long-held industry view that the existing structure was too fragmented and consolidation was desirable. An examination of industry structure and its evolution suggests that efforts to amalgamate have dominated but not universally prevailed. Thus, strong, but not conclusive, arguments exist for feeling that combining companies was desirable.

Insull's proposal is cited as an example of conscious requests for protection from competition. However, this too may not be as conclusive as the proponents believe. The invitation to regulate can be interpreted in another way. The alternative view is that the industry simply recognized that it would be politically controlled in some way and sought the least worst alternative. Insull may have wanted simply to secure protection from policies such as government takeover or insistence on bribery that are worse than supervision. The undesirable effects then arose, not because of the absence of natural monopoly, but because of the drawbacks of regulation whatever the market structure (as discussed below).

Others suggest that whatever the original situation, it has drastically changed. A key contributor to the debate was Leonard Weiss (1975), an economist previously noted for concerns about the inadequacy of competition. At a Brookings Institution seminar, he observed that electricity generation had become a multiplant industry capable of competing vigorously and proposed the spin-off and deregulation of electricity generation. This idea received considerable support and is being implemented by a number of companies under 1990s and 2000s restructuring plans.

In prior writings (Gordon 1982, 1986), I raised two concerns. First, is whether Weiss ignored cost savings from vertical integration (and the costs of disintegration). (Similar concerns appear in Joskow and Schmalensee 1983: 179–98.) Second, as noted below, regulation had extended to checking buying practices. Therefore, “deregulation” of generation might only be a change from control of operations to control of purchases from those organizations.

At the same Brookings seminar and in a later (1986) book, Primeaux (1975) suggested that multiple distribution companies could operate efficiently. He based his arguments on comparing the performance of utilities where competition prevailed to the typical monopoly utility situation. He found that competition in retail distribution lowered rates. (Kwoka's 1996 work confirmed the results.) Skeptics (e.g., Joskow and Schmalensee 1983: 61–62) argue that the sample is too small and too heavily weighted with municipals.

The parallel argument that transmission is potentially competitive also has been made but has no long-standing advocates similar to Weiss and Primeaux. The case is close to that for generation, that multiple operations exist and could operate independently. Others note the existence of alternative rights of ways such as for railroads that could be used to develop alternative transmission systems. Evaluation is complicated by the problems of how electricity flows in a transmission network. Questions are raised about whether ensuring maintenance of system operation in the presence of these characteristics is possible without central control.

However, economic analysis teaches us skeptically to probe such statements. They appear too often as self-serving and invalid efforts to justify intervention. For example, assertions that uniqueness required regulation ill-served us in oil and gas debates. Perhaps the difficulties of devising a free-market solution to system reliability problems of electric power are similarly overstated. The literature is ambiguous.

At least three views arise. First, is that because of the flows, transmission is totally a natural monopoly. Second, is that the monopoly is confined to *aspects* of transmission. Third, is that the argument is overblown. The special physical characteristics of transmission are no more problematic than the special characteristics of other industries.

After years of debate, analysts are starting to back away from assertions that competitive operation is infeasible. Informal discussions with knowledgeable observers have produced indications (but also denials) that the system reliability problems of electric power are overstated. Moreover, discussions have appeared in the literature that suggest ways to price transmission properly (e.g., several papers in Chao and Huntington 1998).

At a minimum, great caution should be exercised in appraising assertions that a really different problem occurs in electric power. These uncertainties, in any case, illustrate why voluntary private reorganization is preferable.

## The Theory of Regulation Reconsidered

While much discontent with the practice of regulation appears in the economic literature, the basic theoretical issues have received inadequate attention. It is, of course, widely recognized that regulating an industry that is not a natural monopoly has no economic rationale. It is, as noted, often argued that at least the generating portion of electric power is not monopolistic and can safely be deregulated.

The critical neglect is of the defects of the two key tacit premises of the case for regulating natural monopolies. Regulation is appro-

appropriate only if natural monopoly is inefficient, and if a government agency can correct that inefficiency. However, the first proposition comes from an incomplete view of monopoly theory, and the second is an act of faith with no theoretical or practical justification.

Economic theory indicates that monopoly inefficiency occurs with the absence both of credible threats of entry and the ability to employ efficient price discrimination. However, design of efficiently discriminatory price systems is a central theme of the vast theoretic literature on natural monopoly. (Berg and Tschirhart 1988, Brown and Sibley 1986, Train 1991, Spulber 1989, and Wilson 1993, are key books and also cite important material too extensive to cite here. Schmalensee 1979 provides a particularly useful literary view of the issues.)

In particular, economic efficiency always requires a price of marginal consumption equal to the marginal cost of the optimal level of output. With natural monopoly, such a price produces a deficit. To keep the firm viable requires devising a means to cover that deficit. Among the ways to secure the extra revenues are by a separate lump sum payment for the right to secure access (as is common with telephone service) or charging higher rates on inframarginal consumption (as in the declining block rates common with electric power).

An alternative is to finance the deficit with government subsidies (Hotelling 1938 and Vickrey 1948, but see Coase 1988 and Ruggles 1949–50 on the drawbacks). Coase's (1988: 84–85) point that total reliance on consumer payments provides clearer information about demands than subsidies seems the most convincing. He provides further criticisms on the dubious income distribution effects and the distortions arising from the taxes levied to finance subsidies (Coase 1988: 85–90).

A curious third alternative is Ramsey pricing as proposed by Baumol and Bradford (1970). Instead of the schemes emphasized here, where each customer makes some form of inframarginal payment, the Baumol-Bradford (1970) concept of Ramsey prices eliminates the inframarginal charges on each customer. Each pays a uniform price, but that price differs among customers. Following hallowed tradition in this approach to price discrimination, the most price-sensitive consumers are charged the least. The advocacy seems misplaced. The Ramsey prices require more information than does setting inframarginal charges. Ramsey prices only set different gaps between price and marginal cost for different customers and thus, at best, reduce but do not eliminate the output loss. The inframarginal charge approach, at least in principle, can produce marginal prices equal to marginal costs.

Left to itself, a monopoly capable of discriminating would push to

the point at which marginal transaction costs equaled the marginal increase in profits. The essence of public utility regulation then becomes seeking to limit how much *attainable* market power is exercised (assuming that the monopoly is more than barely viable so that monopoly rents exist to be captured). It immediately follows that regulation is unnecessary to ensure efficiency but might offset the possibly inequitable income distribution effects of maximum feasible discrimination.

As obvious as this conclusion should have been, only one major commentator, Richard Posner (1969), has stated the argument. To be sure, his statement is presented circuitously with many digressions into issues that are no longer relevant. Nevertheless, the message should be clear to trained economists. The literature mentions Posner but does not discuss his case. Posner adds that it is doubtful whether the transfers are large enough to justify action (p. 566) or even, given the wide holdings of utility stocks, inequitable.

Technical discussions of discriminatory alternatives distinguish between the extent to which discrimination produces the maximum possible gain to monopolists. When the maximum possible benefit (transfer of all the consumer surplus) occurs, this is termed first-degree price discrimination. A charge system that captures less than all the surplus is termed second-degree price discrimination. However, the relevant distinctions are among different levels of second-degree discrimination. Transaction-cost arguments suggest that, while the conditions for attaining second-degree discrimination can be satisfied, first-degree discrimination is infeasible. The gains of second-degree discrimination would not be offset by administrative costs, but those of seeking first-degree discrimination would be.

Posner's case that regulation is unlikely to promote efficiency even if monopolistic inefficiency prevails has two basic elements. The first is that even if the vision of impartial experts devoted to promoting efficiency were not a myth, the practical problems of implementation preclude success because the costs are greater than politicians are willing to bear (and, indeed, some critics assert, infinite). The second, as illustrated by various (subsequently developed) economic theories of regulation, stresses the problems that arise because impartiality is a fable. Goals other than increasing efficiency produce higher political payoffs and, therefore, are pursued.<sup>1</sup>

The overriding implementation problem is that a mass of informa-

<sup>1</sup> A vast literature treats this topic. Schumpeter (1950), Downs (1957), and Niskanen (1971, 1994) treated broad issues about governments. Then, Stigler (1971), Posner (1974), and Peltzman (1976, 1998) examined the special problems of regulation.

tion is needed to identify and correct inefficiencies in the operation of natural monopolies. Many who believe that Austrian and Chicago economics overstate the case for preferring markets to governments, nevertheless, recognize that the governmental overreach problem stressed by such economists as Hayek (1945, 1976) and Coase (1988) arises in public utility regulation. The amount of information needed is indeed unmanageable.

Posner's (1969) article includes illustrations of this point. He notes that the problems of setting and monitoring rates are so great that regulation may be ineffective (pp. 592–96). Perfect limitation of profits, if it were possible, could kill incentives to become more efficient and innovative (pp. 597–99). Regulation will encourage entry into unregulated business in which profits can be hidden by artful accounting (p. 605). He adds that commissions lack the resources to monitor the prudence of expenditures (p. 617). He indicates that at the time of writing no efforts were made. The turmoil caused by extensive subsequent efforts at prudence review is a prime impetus for reorganizing electric power and its regulation.

Moreover, several apparently neglected special implementation problems arise with public utility regulation. First, Posner recognized only part of the income distribution dilemma associated with public utility regulation. He concentrates on use of rents to undertake inefficient actions. Posner and apparently everyone else ignore that discriminatory pricing with a break-even constraint always turns regulators into *arbitrary* reallocators of rents that the utilities would otherwise retain.

The distribution problem occurs even if regulation is employed simply to promote efficiency and limit profits. Whatever the pre-regulation situation, the profit reduction goal of regulation is equivalent to a commitment to income redistribution. Profit reduction is returning to customers all or a portion of the excess profit potentially attainable. If any regulatory success occurs, we have a pot of money to be divided up. The mathematical principles of division indicate that anything can be split in an infinite number of ways. For example, everyone could get a share of the reduction, or the benefits could be confined to selected categories of customers.

Posner's concerns about the uncertainties about the merits of different customers apply. Attaining efficiency by regulation may be infeasible, but at least clear principles of action exist. Economic analysis, in contrast, strongly emphasizes the lack of similarly satisfactory rules for redistributing income. A vast literature exists on the pitfalls of income redistribution policies. Nothing in economics, law, moral philosophy, or any other field provides clear decision rules. The regu-

lators must become philosopher kings to decide on an allocation, obviously an unreasonable requirement. The most deterministic ethic of which I am aware, Nozick's (1974) insistence on total sanctity of property rights, opposes rather than guides regulation. Objection to taking does not help decide how to give (i.e., set the shares of the necessary cost burdens). Moreover, the limited knowledge of regulators implies that they cannot possibly know the difference from what would have been charged without regulation and what the regulated rates would produce.

The one clear conclusion that emerges from broader discussions of equity is that specialized, limited focus programs are unsatisfactory methods of redistribution. Such narrow programs are cumbersome, make questionable judgments about what type of aid should be provided, and are particularly prone to capture by undeserving interest groups. Public utility regulation is the quintessence of a specialized limited focus program.

A second, surprisingly neglected problem is that no valid method exists to allocate joint costs without also considering demands. A key but often implicit proposition of economics is that where jointness in production prevails, allocation of costs to products is both meaningless and irrelevant. Textbook (except Stigler 1987: 168–69) and monograph discussion of the impossibility of cost allocation is almost nonexistent. Of course, more specialized writings make the point. The general conditions for efficiency are that for all products, price equals marginal costs and *total* revenues are greater than or equal to total costs. The market, not an accountant's before-sale allocation, determines how much each product contributes to cost recovery. Jointness, of course, prevails in all interesting production processes including those in the main industries thought to be natural monopolies.

For electricity, natural gas, and telecommunications, three major product differences prevail. End users differ radically in the nature of their demand. Some have large uses that can be served with low-cost distribution facilities; others have small uses and require more expensive distribution networks. Some customers in each end use are better located relative to supplies than are others. Significant time-of-use variation prevails. Under any circumstances, the plethora of different products means the need to develop many different prices. Under these conditions, more degrees of freedom about how to effect cost recovery can arise. The futility of cost allocation and the arbitrary nature of allocations of the benefits from reducing profits below their maximum levels imply an inability to evaluate decisions by which cost recovery by inframarginal charges is shared.

The third difficulty is that, as another fragmented and inadequately



examined literature indicates, conventional accounting uses rules that are inappropriate for economic analysis of profitability.<sup>2</sup> Regular accounting data among other things fail to adjust for price level changes, use mechanical formulas unrelated to market experience to determine how much initial investment is recovered from sales, and try to allocate joint costs without considering demand.

Visions noted above stressing that impartial search for efficiency is unlikely can and do take two forms. Simple capture theories (Stigler 1971) stress that cozy relations between regulators and the regulated firms bias policies toward assisting companies. More sophisticated theories (Peltzman 1976) see regulators as tempted to scatter benefits among different interest groups. This aggravates the income distribution problem noted above. The grant of discretion also allows regulators to pursue undesirable goals such as fads in social policy.

Here too Posner (1969) reviews some of the key examples of both pro-firm and broader distortions. He recognizes the undesirability of both preventing entry and imposing minimum price requirements (pp. 611–16). His central points are that in the absence of regulation the market can sort out who should survive and that entry controls perpetuate monopoly. He concludes that removing entry restrictions removes the need for minimum or maximum rate regulation (p. 616).

Anticipating still inadequately recognized arguments, Posner indicates that regulators encourage high rates on some customers to finance lower rates to other customers (such as favoring rural over urban customers) (pp. 606–8). He adds that no unregulated monopoly would follow this practice (termed by many writers other than Posner as cross-subsidization) (p. 606). He concludes that such subsidy “is an incredibly crude instrument for assisting needy or deserving elements of society” and that the subsidy is inefficient (p. 608). Posner adds that the much-discussed problem of inefficient loss of customers (cream skimming) arises from inept favoritism of customer classes and inspires efforts to restrict such entrants (p. 608). He pauses to argue that regulation may be a major cause of failure to employ “promotional pricing” (which his examples indicate that he meant time-of-use pricing) (pp. 610–11).

Posner also provides a review of the defects of various suggestions to improve regulation. While most are familiar, he points out the defects of reliance on developing yardsticks against which to compare performance, a subsequently revived concept then out of fashion. He

<sup>2</sup> Edwards and Bell (1961), while dated, is the best reference of which I am aware. It provides an extensive and valid development. A more recent but less thorough discussion appears in Fisher, McGowan, and Greenwood (1983).

stresses that valid comparisons may be difficult to make. He starts by noting the uniqueness when he wrote of AT&T (p. 628) but adds that even when numerous operations exist, statistical analysis lacks the power to provide satisfactory ways to adjust for the peculiarities of each company (pp. 628–29).

These arguments suggest that regulation, even if natural monopoly exists, is pursuing goals not appropriately trusted to specialized bodies, cannot be implemented at reasonable cost, and may be deliberately implemented in questionable ways.

### Illustrations from Regulatory Practice

Examination of regulatory experience invariably seems to indicate that performance is even worse than the most critical a priori analysis suggests.<sup>3</sup> The litany of electric-power-related regulatory failures is another example of this tendency. Three aspects are critical. First, it was the regulators who created the problems that require reform, and this should produce suspicion that they are capable of making improvements. Second, the proposals made to reform electricity substantiate the concern that the regulatory mentality produces undesirable actions. Third, the ample record of restructuring efforts indicates severe prior failures.

Extensive, convoluted government involvement in the activities of electricity generation, transmission, and distribution existed long before the 1970s. Since that time, many more initiatives, all unwise, were undertaken. Stress here is placed on arguing that New Deal programs in electric power and the increase in regulatory activities since the 1970s had undesirable effects.

Since the imposed restructurings long antedated and influenced the regulatory breakdown, the efforts to reorganize are discussed first. The New Deal of the 1930s produced four federal electricity programs whose impact persists. Three were restructuring oriented. In 1935, a two-part law simultaneously created federal public utility regulation of “wholesale” dealing in electricity and, in the Public Utility Holding Company Act (PUHCA) portion, ordered change in the holding company approach to public utilities and made the Securities and Exchange Commission (SEC) responsible for monitoring the creation of new holding companies.

A third set of actions created federal electric power supply organizations, most importantly the Tennessee Valley Authority and the

<sup>3</sup> In this section, I draw upon a sprawling literature consisting of government documents, many books, and many more articles, almost none of which contribute enough to justify explicit citation.

Bonneville Power Authority. Both TVA and BPA also inspired state and local responses to create distribution utilities to resell federal power. Some independent steps such as the creation of a large power authority in New York and government takeover in Nebraska also occurred. Fourth, a federal program was created to provide loans to rural cooperatives at interest rates below those charged in financial markets. The arguments made above against subsidizing specific goods to redistribute income indicate that this subsidy is undesirable.

None of these innovations seems to have worked very well. The case is clearest with PUHCA. The 1935 act required a massive effort to restructure U.S. public utilities and control future changes (Gordon 1992). The evidence suggests that the required restructuring of the existing holding companies (into supposedly one-industry firms operating as single entity in a physically continuous region) made little sense and the law subsequently has been an unnecessary burden on the restructured industry.

Many observers have recognized that since the objectives of the act were attained long ago, the act is no longer needed. The implementation of the act has received limited scrutiny. This is unfortunate because the results are puzzling at best. Inconsistent solutions were adopted. Nothing indicates that whatever the optimal size may have been, it would require the resulting pattern of more companies in several less populous, less industrialized states than in larger more industrialized states or the wide differences in organization among similar states. Whether or not large companies were allowed was independent of the economic size of the service areas.

One basic problem was that restructuring was limited to breaking up the part of the industry owned by holding companies. Many large companies were not owned by a holding company and thus ignored. However, inconsistencies arose in treating different parts of such holding companies. If larger companies were desirable, no power existed to combine companies with contiguous service areas when they were owned by holding companies independent of each other. The implementation of PUHCA, therefore, demonstrates the defects of governmental restructuring. (More broadly, it also is another example of how, once demagogic charges are made, politicians move to ill-conceived further action.)

Thinking to this day about the law involves mindless acceptance of a massive and even more mindless 100-volume plus survey by the Federal Trade Commission. While most of the material in the 1935 survey is unreadable, appraisal volumes for the electricity realm were issued (parts 72A and 73A—by themselves amounting to about 1,100

pages). The conclusions are even part of PUHCA. This is unfortunate because the analysis was clearly incomplete and questionable.

The main defect for which the holding companies were faulted was “unrealistic” accounting. As the FTC did not do, the complaints can be divided into two types—practices that supposedly deceived regulators and practices that allegedly tricked investors. The FTC failed to analyze the charges. They amount to a special case of Posner’s concerns about the ability to manipulate accounting data to undermine regulation.

Trying to employ cost-accounting procedures that raise apparent costs and inspire higher rates is a predictable response to regulation. The critical issue in evaluating holding companies is whether they materially undermined regulation. The charge of financial manipulation is an application to public utilities of an accusation against all corporate financial reporting of the era, and the general indictments have not stood up under scrutiny. This may also be true of the special allegations about holding companies. The arch villain of the case, Samuel Insull, was acquitted of fraud charges.

Obviously, anyone who believes in the inherent futility of regulation would consider the charges against holding companies irrelevant. Those with more faith in regulation should still ask whether the PUHCA rationale that the holding company materially increased the difficulties of regulation is valid. Not only is the advantage of holding company structure for cost manipulation uncertain, but, more importantly, regulators, who proved willing to second-guess purchasing decisions including that of fuel from wholly owned subsidiaries, could have similarly challenged fees to holding companies.

Certainly, the fantasy among regulators that SEC and Federal Energy Regulatory Commission (FERC) efforts “resolve” the defects of cost-of-service regulation is nonsensical since, as shown above in discussing joint production, the problems have no unique solution. Apologists for PUHCA (e.g., Stalon in Andrews 1995: 30–31), nevertheless, have extended the argument into the fantasy that the act saved regulation from insuperable barriers that (only) the rise of the holding company created.

The argument goes beyond the FTC assertion that the lack of regulation of the parents created loopholes. It is further asserted that the holding company structure created interstate companies that no one state could adequately control. PUHCA did not end that “problem.” Almost all the holding companies of today (both those surviving from PUHCA and those established in subsequent mergers) and many unitarily structured survivor companies are multistate. Thus, claims that federal intervention solved the problem of split jurisdiction are nonsense. Issues of sharing burdens among regions still exist,

and again, no unique solution exists. Efforts to shift charges are inevitable.

The pre-PUHCA holding companies actually did not comprise just a few giants, each controlling vast parts of the industry. Comparisons between reports in *Moody's Public Utilities* and a U.S. Energy Information Administration (EIA) Internet database reporting sales and generation by individual utilities suggest that the holding companies ranged widely in size, scope, and coherence. At most a half dozen can be considered to have developed one or more regional networks that were (or could have become) major physically integrated companies. Others had much smaller more fragmented holdings. Many important operating companies were independent.

Inconsistencies arose in PUHCA treatment of different parts of such holding companies. At one extreme, a large holding company (Texas Utilities) was constructed by combining units of two separate subholding companies of Electric Bond and Share (the largest of the holding company empires and one untouched by scandals). (Texas Utilities subsequently eliminated its subsidiaries and ended its status as a regulated holding company.) A portion of the Insull empire was transformed into Central and Southwest, which was not physically integrated for long.

At the other extreme, much smaller contiguous companies were kept separate. The worst case involved very small companies in New England that were once in a subholding company in the Insull realm. While the Insull bankruptcy may have hindered continued integration, this was not true of the next worst case of the Electric Bond and Share companies in the Northwest. However, given that each holding company controlled operating companies that could not be physically tied to other components, the most frequent outcome was to affect the independence of companies as they existed.

Treatment of PUHCA's prohibition against participation in different regulated activities provides another graphic illustration of the problems. The act necessarily failed totally to eliminate utilities engaged in sales of both electricity and gas. Several major companies of that type (e.g., Pacific Gas and Electric) were not holding companies and thus exempt from the act. Moreover, the SEC allowed preservation of gas activities by operating companies (e.g., Consumers Power) spun off by holding companies. For some reason, holding companies (e.g., Entergy) that emerged from PUCHA restructuring still have some gas sales.

The case against public power is the general case against public ownership. Experience has confirmed the doubts. Moreover, belief that government-owned utilities would perform better than private

ones has lost favor even among those generally supporting active government. The stock phrase employed by this camp is that the government operations are just like other power companies. Public ventures actually are worse than private companies because of the absence of profit requirements on the public sector.

For example, the literature on TVA from strong free-market advocates, moderates, and environmentalists is strongly negative. The minimum economic criticism is that moving on from waterpower with possible but probably nonexistent public good aspects to becoming a substantial generator of electricity in coal- and nuclear-powered plants is inappropriate. Moreover, the conduct of coal and nuclear generation has many defects. Much criticism was directed at TVA's lack of concern over the air pollution and land disturbance associated with its coal generation. Its completed nuclear plants had to undergo prolonged shutdowns to overcome (perceived) operating defects. Its reaction to the 1970s slowdown in expansion prospects seems worse than average. In particular, in the late 1980s, TVA deliberately and expensively delayed cancellation of uncompleted nuclear units.

BPA avoided direct errors by never entering thermal production; BPA, in fact, is a marketing agency for hydroelectric plants operated by the Army Corps of Engineers and the Bureau of Reclamation. BPA promoted construction of five nuclear-powered units in Washington by a consortium of mostly public power operations with three units guaranteed by BPA revenues. Only one unit was completed, and a massive default was produced when the two unguaranteed units were canceled. The performance of cooperatives seems to receive little attention. However, noticeable bankruptcies have arisen from overexpansion.

In an age of restructuring, these publicly owned and cooperative operations are such important factors in the industry that their privatization is essential to effective deregulation. The problem is aggravated by the defects of the existing structure. Tables 1–3 generated from the EIA electricity database noted above summarize the complex industry structure prevailing. Table 1 shows the effect on private-sector data of showing every operating entity without recognition of parent and subsidiaries or joint ventures. While 239 “firms” are listed, only 151 independent entities operated in 1998. Subsequently completed and pending mergers reduce the number of independent private companies; forced divesting of generation has lowered the role of “utility” generation (although many buyers are the “nonutility” affiliates of leading electric utilities).

Table 2 presents selected data about the different types of companies that operate. One key result is that all three indicators chosen

TABLE 1  
NUMBER OF REPORTED PRIVATE UTILITIES IN 1998

1. Holding Companies <sup>a</sup>	21
2. Operating Companies with Subsidiaries	8
3. Operating Companies without Subsidiaries	122
4. Total Independent Entities (1+2+3)	151
5. Joint Ventures	13
6. All Companies with a Subsidiary Relationship	104
7. Total Reported Companies (3+5+6)	239

<sup>a</sup>Excludes newly created parents for single, extant operating utilities.

SOURCES: Company and U.S. government reports.

show that privately owned companies are small in number but still account for over 70 percent of industry activity. Second, the largest number of utilities are municipal, but most are small and dependent on purchases to secure electricity for final sales. Higher levels of government are a key source. The generation sales ratio rises with the level of government. Of particular note is that the 10 federal entities produce so much electricity. The cooperative sector also has a large number of entities and generation less than final sales.

Table 3 shows that most entities do not generate. Two peculiarities need note. First, almost all cooperative generation occurs in generating and transmission units serving a group of nongenerating distribution utilities. Second, when consolidated, 127 of the 151 private utilities generate. The patterns of ownership and size, moreover, differ widely among states. Tennessee and Nebraska have almost total government ownership; none occurs in Hawaii or the District of Columbia.

Most critically for reform, the public and cooperative sectors constitute a small, but not negligible, part of the industry. Their existence has no convincing justification and is another barrier to efficiency.

## Federal Power Regulation

As a result of the 1935 legislation and its revisions, FERC, the successor of the Federal Power Commission, regulates wholesale transactions in interstate commerce. This should be viewed as aggravating the splintering of regulation. In particular, the way the law is interpreted encourages shopping for the best regulator. Two considerations are critical. One is an aspect of the broadened concept of interstate commerce that emerged in the 1930s. (Free-market advocates recognize this revision was a major source of expanded government and seek its reversal.) If a company participates in interstate

TABLE 2  
THE ROLE OF OWNERSHIP TYPES IN U.S. ELECTRICITY 1998

	Number of Entities	Percentage of Total				Revenues from Final Sales	Generation as a Percentage of Final Sales
		Number	Generation	Kilowatt/Hour Final Sales	Revenues from Final Sales		
Federal	10	0.32	9.17	1.44	0.51	633.52	
State	27	0.85	2.24	0.73	0.84	305.88	
Intermediate	122	3.85	4.32	2.93	2.40	146.77	
Municipal	1,860	58.68	5.03	11.34	10.55	44.09	
Total Government	2,019	63.69	20.76	16.43	14.30	125.60	
Cooperative	912	28.77	7.67	10.17	9.82	74.91	
Private	239	7.54	71.57	73.40	75.88	96.91	
Industry	3,170	100.00	100.00	100.00	100.00	99.39	

SOURCE: U.S. Energy Information Administration.



TABLE 3  
NUMBER OF U.S. GENERATING UTILITIES BY SECTOR, 1998

	Number Generating	Total Number	Generating as Percentage of Total
Federal	8	10	80.00
State	19	27	70.37
Intermediate	48	122	39.34
Municipal	517	1,860	27.80
Total Government	592	2,019	29.32
Cooperative	84	912	9.21
Private	186	239	77.82
Industry	862	3,170	27.19

SOURCE: U.S. Energy Information Administration.

commerce, even its intrastate transactions are subject to federal control. Second, FERC uses a concept of companies antithetical to PUHCA. Under FERC, dealing between separately incorporated utilities is wholesale trading even if the operations share a parent or are in a parent-subsidiary relationship.

Thus, utilities can and do organize to attain or avoid federal regulation. The classic cases of seeking federal involvement are the three Massachusetts-based holding companies that each concentrated generation in a separately incorporated and thus federally regulated subsidiary. Probably similarly to lessen growing regulatory pressures, new generating subsidiaries have emerged in other regions; such major companies as American Electric Power and Entergy are examples. In contrast, two large Texas electric utilities, Houston Lighting and Power and Texas Utilities, so strongly resisted federal regulation that they avoided interties with the rest of the United States. A side effect was the former unintegrated status of Central and Southwest noted above. Central and Southwest had divisions wholly within the Texas pool kept separate and others in a pool connected to the rest of the United States.

### The Curious Case of Nuclear Power

Attitudes toward peaceful nuclear energy are unduly influenced by recollections of the military aspects of nuclear energy. Peaceful use was a salve to the conscience of the advocates and an affront to the opponents. Proponents see development of numerous peaceful uses as the best form of atonement. Others consider nuclear energy so evil

that every use should be prohibited. Attacks on nuclear power are almost indistinguishable from the “ban the bomb” movement. Peace as well as environmental groups advocate refraining from nuclear activity. The invalidity of the attacks on atomic power from both groups is a badly neglected example of the defects of environmental advocacy.

Nuclear power, however, was initially force-fed by a series of federal initiatives to promote nuclear development. In particular, federal subsidies were given nuclear power development. The old Atomic Energy Commission and its congressional supervisor, the Joint Committee on Atomic Energy, were advocates of peaceful use. This can be viewed skeptically independently of environmental belief.

The 1970s proved the critical decade for nuclear power. Following on the federal impetus, the leading reactor manufacturers (who were mainly the leading producers of conventional powerplant equipment—General Electric, Westinghouse, Babcock and Wilcox, and Combustion Engineering) promised to deliver electric power plants at a cost competitive with coal-fired plants. To many utilities, the attractiveness of nuclear power was increased by growing difficulties in fuel, particularly coal, supply and utilization.

The coal industry was going through a period of increased union militancy and more stringent regulation of production. The oil option to which many East Coast utilities had turned became unattractive after the massive rises in oil prices of the 1970s. At the time, the environmental problems with fossil-fuel burning appeared more costly to control than those with nuclear power. As a result, massive orders for nuclear plants were made in the early 1970s. To compound the problem, the industry responded to the oil price increases by planning for extensive expansion, perhaps in the expectation of substitution of electricity for oil but possibly because of failure to anticipate the consumption-reducing effects of higher energy prices.

In less than a decade, nuclear power policy switched from promotion of peaceful use to accommodation of opposition. With the splitting in 1974 of the Atomic Energy Commission into a regulatory arm, the Nuclear Regulatory Commission (NRC), and a research arm, the Energy Research and Development Administration (ERDA), nuclear regulation began to emphasize assuaging concerns about nuclear power.

ERDA was the main agency of those that merged in 1977 to form the Department of Energy. Indeed, the inheritance of the AEC legacy is a prime problem of DOE. The military nuclear responsibilities are a persistent drain on DOE. Energy initiatives were further thwarted by inheritance of many AEC practices including heavy de-

pendence on the network of national laboratories with primary expertise in nuclear matters. The undesirability of this reliance was evident long before the 1999 Los Alamos furor. This separation accomplished the formal desire to remove a perceived conflict between the promotional aims of the research program and the alleged need for government regulation of nuclear safety.

The essence of the process is supervision of plants from conception to dismantlement with the right to require changes at any time. The effect on the electric power industry was devastating. As I learned from interviews with the companies from late 1960s to the early 1980s, hope for liberation from fossil fuel use turned to facing intolerably open-ended regulation (Gordon 1982).

By the end of the 1970s, the electric power industry was retreating from the massive expansion plans for nuclear (and coal-fired) plants. As is too often the case in such situations, too many plausible explanations exist, and data are inadequate to choose among them. Powerplant construction costs rose more rapidly than the cost of living. Coal and for a time uranium prices increased sharply. Electricity demand was responsive to electricity price rises. Nuclear policy, as noted, turned permanently hostile. Whether the demise would have come whatever government policy prevailed cannot be determined from the available record. Better data are unlikely to emerge.

Despite its sacred cow status, the record of nuclear regulation is as depressing as those of other forms of regulation. In the aftermath of the Three Mile Island accident, a special presidential commission and an NRC-sponsored study both argued that the regulatory process failed badly at adequately ensuring safety. The deficiencies were intrinsic to NRC's setup, and nothing since suggests improvement. Indeed, the intrusive, mindless actions persist. The process imposed intolerable burdens on the industry. To quiet every fear, the NRC to this day imposes draconian measures. Plants deemed to operate unsatisfactorily are required to undergo extended shutdowns to undertake extensive and expensive remedial measures. Little assurance exists that these efforts are worthwhile. The threshold for such actions may be set too low; plants with long records of satisfactory performance have been targeted. In several cases, the result was permanent closing.

When nuclear plants were still being built, the NRC in several notorious cases allowed opposition to proceed for long periods. It is no coincidence that among the most expensive nuclear units in the United States are the Seabrook unit in New Hampshire owned by a consortium of New England utilities and the Diablo Canyon units of California's Pacific Gas and Electric. Both were delayed by protracted

regulatory battles. (An even worse case was Long Island Lighting's Shoreham unit. After completion following a drawn-out regulatory battle, the unit was shut down by the refusal of New York Governor Mario Cuomo to accept its operation. New York politicians continue to grapple with how to deal with the costs incurred in this fiasco.)

## Environmental Regulation of Fossil Fuel Burning

Air pollution from existing industrial processes produced another type of problem—frequent, invariably more restrictive changes in the laws. This process is convoluted. Up to 1990, concentration was on the five criteria pollutants—sulfur oxides, nitrogen oxides, particulates, unburned hydrocarbons, and carbon monoxide. More ambitious goals and ever more specific rules to meet them were imposed. A two-tiered system emerged. Part of the law dealt with the goals for the concentration of pollutants in the atmosphere (or in the jargon of the process, ambient air standards) and general rules about how to attain these objectives. Another part independently specified compliance rules for different pollution sources. Thus, Congress introduced new source performance standards in 1970.

In 1977, several extensions were enacted. (1) The new source performance standards were shifted to require use of best available control technology. (2) A mercifully impotent provision requiring consideration of effects on local coal was enacted. (3) Vague provisions requiring consideration of effects on visibility at scenic areas were imposed. (When the law was new, concerns were raised at least by a few alarmists that the provision could have severe impacts if expansive concepts of scenic areas and the appropriate buffer zone were imposed. Actually, a more limited approach was employed, but, in standard Clinton administration fashion, adoption of a more comprehensive implementation is under consideration.) (4) Congress tried to establish guidelines to resolve the difficulties of dealing with a requirement in a court decision that prevention of significant air quality deterioration in high air quality regions was implicit in the law.

The 1990 Clean Air Act Amendments combined (1) further modifications in the existing air quality goals and rules about how they must be met, (2) the widely criticized addition of restrictions of emissions of toxics—a long list of chemicals and metals from many industries, and (3) the so-called acid rain program. The last was a plan for more stringent sulfur oxide and nitrogen oxide emission controls at existing power plants. The rationale for this change is at best controversial. The most publicized justifications were impacts on lakes and forests in the path of acid emission movements. However, since these

effects were probably not important enough to justify regulation, further rationalization was provided by recalling the benefits such as to health associated with emission controls. These benefits, however, were precisely those that had justified early regulations. Thus, the change can be considered just another ratcheting up of standards.

Of more importance because of the warnings it provides of dangers of regulators bearing gifts is the true nature of the emission control goals. The law lists which units at large electric plants must reduce emissions. Thus, the law starts by greatly extending command and control micromanagement. Then, an experiment is launched in using a favorite economist's tool of marketable permits to allow each unit more flexibility in meeting the requirements. For some reason, commentators have chosen to ignore the micromanagement side and extol the marketable permit side. At least one reason to dwell on this is for the lessons it provides about imposed restructuring.

Two other points arise. First, a further problem is that in deliberate defiance of the economic principle that secure property rights must be granted, the Clean Air Amendments of 1990 explicitly say that no property rights are associated with the permits. Congress was more concerned with the irrevocability of commitment associated with a property right than in making the system work.

Second, emerging concern (e.g., McChesney and Shughart 1995) that economists have become too uncritical of antitrust is a reminder that environmental economics is an even worse case. The economic literature severely attacks practices in every realm. However, whether failure is inevitable is rarely asked. Environmental economists inadequately relate their invariable conclusion that regulations are poorly enforced to Coase's caution (1988: 114–19) that when transaction costs are high, the choice among a public solution, a private solution, and inaction is unclear. For example, commentators, uncritically echoing the Bush administration, were so dazzled by the weak sop to market processes of the permits that they overlooked the underlying dirigisme.<sup>4</sup>

## The Problem of Regulated Ruin

Another side of the concern is that so much of the difficulties of the electric power industry is due to regulatory overreach. The 1970s

<sup>4</sup> The law was a monstrosity in form as well as substance. The many major energy and other environmental laws that I have examined are invariably badly written, full of pernicious policies and demonstrably nonsensical findings but still comprehensible. The Clean Air Amendments of 1990, however, is not; I needed EPA summaries to get an intelligible interpretation.

brought rising prices in energy markets and policy changes reflecting the turmoil and other forces. State regulators independently adopted measures to increase control over utilities, responded to two major federal mandates to alter practice, and, in some cases, decided to remedy perceived deficiencies in federal policy. The experience provides ample evidence of Posner's prescience.

The initial response to frequent requests for rate increases necessitated by the changing economic climate was multifaceted resistance. Simple denial of requests was supplemented by numerous forms of increased examination of realized and anticipated actions. Both major cost elements—construction and fuel purchases—were scrutinized. Each of the three possible fuel procurement methods—long-term contracts, spot purchases, and vertical integration—was challenged somewhere. Similarly, the prudence of past and planned investment was scrutinized. Utilities were penalized for allegedly avoidable cost overruns and for not knowing capacity would not be needed. Management audits also were initiated.

Proposals have arisen to have regulators develop and incorporate into evaluation estimates of the uninternalized externalities of electricity generation. These are defined to include national security and supply diversity impacts as well as those on the environment. If those who were supposed to have the germane expertise could not properly exercise their responsibilities, how can the average state agency that cannot even handle its traditional responsibilities do better? Thus, these programs are ill-conceived. They constitute more misuse of economic rents. This indicates that the unwise politicization that Posner decried has greatly increased.

The mass of federal energy regulations in the 1973–92 period had many elements that at least potentially had significant direct or indirect impacts on electric power. Two proved central. The 1978 Public Utility Regulatory Policy Act (PURPA) urged that states consider many kinds of changes in regulation. However, the only major response was to the requirement to establish a mechanism to encourage utilities to purchase power from types of nonutility generators (NUGs) deemed worth encouraging. These consisted mainly of those using renewable resources (other than traditional large hydroelectric facilities) and “cogeneration,” electricity production by industrial companies in the facilities providing energy to their operations. Utilities were to be required to purchase from these sources when they were cheaper or, in the jargon that was developed, when the avoided cost was lower. However, the states were granted considerable discretion about how these costs would be estimated.

Given that the process involved choosing among investment op-

tions, estimates of lifetime costs had to be made. Given the climate of the time, estimates in states partial to NUGs incorrectly assumed substantial, steady rises in the cost of conventional sources of power. Utilities became committed to contracts at higher prices than are justified by prevailing market conditions. Again imitating prior experience (with fuel procurement contracts), the move to the economically appropriate task of contract renegotiation is only slowly emerging.

Experience produced mixed results. Small plants had several features that made them economically attractive. Their short lead time, low capital investment characteristics made them more flexible in an era of low and uncertain growth than the traditional large plants with their high unit and total capital costs and long and growing lead times. To the extent that suppliers would assume the risk of these ventures, they were even more attractive. (In fact, just how much risk was being assumed was controversial. It appeared that the utilities were being forced into long-term contracts that made the utilities the effective risk takers.) NUGs became an increasing portion of new supplies. The evidence suggests that from fairly modest beginnings in the middle 1980s, additions of nonutility generation increased while utilities lowered their own additions. In 1998, NUGs accounted for 84 percent of capacity additions.

At least part of the industry saw independent generation and perhaps even the adoption of Weiss's proposal for totally independent generation as desirable. However, this enthusiasm was neither completely shared nor unqualified. Toward the end of the 1980s, two radically opposed factions on the NUG issue arose in the electric utility industry (with important parts of the industry outside both coalitions). One side led by Houston Industries was traumatized by the abuses under PURPA and viewed warily the (clearly overdone) claims of the gas industry. This group nostalgically asked for *restoration* of their "compact" with the regulators.

While gas-supply potential has been underestimated, it is unlikely that the gas industry can economically serve its traditional markets plus a large part of electricity generation and transportation.<sup>5</sup> If natural gas output and transmission could readily be massively increased with little cost penalty, a much greater rush to gas would have emerged. Modest investment is required to enable a coal-fired plant to burn gas; the biggest costs arise when extensive investment in pipelines is needed. Similarly, if alternative energy, whatever it may

<sup>5</sup> In 1999, the electric utility industry consumed 26.9 quadrillion BTUs of coal and nuclear energy, and 3.2 quadrillion BTUs of natural gas. Total U.S. natural gas consumption was only 22.2 quadrillion BTUs.

mean, were so wonderful, its utilization would not need to be force fed.

Another side saw NUGs as their last best hope. The advocates of incentives to NUGs subdivided between those such as New England Electric hoping to buy more from NUGs and those such as Pacific Gas and Electric and Duke Power wanting to become NUGs. Given congressional resistance to total repeal of the Holding Company Act, the advocates settled for changes that exempted new NUGs from the act by removing the sweeping definition of a holding company. (These changes were embedded in a law whose other provisions unwisely extended government tinkering with energy.) Under prior law, almost all subsidiary-parent relationships were treated as holding companies. The revisions enacted in 1992 exempted operations that were incidental to the main activities of the firm. Thus, the power producing subsidiary of a gas pipeline, an engineering firm, or even an electric company from elsewhere in the country, no longer would be covered by PUHCA.

A key issue raised in the debate over the 1992 act was access of NUGs to transmission facilities. In standard congressional fashion, the onus for decisionmaking was delegated. The FERC was to act if access was being unreasonably withheld on NUG sales to distribution utilities. However, FERC was prohibited from requiring transmission to final consumers.<sup>6</sup>

Another 1978 law, the National Energy Conservation Policy Act (NECPA), among other things encouraged utilities to assist customers in reducing energy use, a process that came to be known as demand-side management. Such demand-side management was and remains a dubious idea. Two types of consumption inefficiency are logically possible. The service may be mispriced, or consumers may respond inefficiently to a correct price. The former concern clearly had considerable practical relevance given massive government interference in the price of electricity and in 1978 the fuels used to generate. However, removing such controls is preferable to correcting the effects by regulation. Removal is hindered only by lack of political courage. In contrast, the defects of regulation guarantee failure at regulatory offsets to inefficient prices.

Incorrect response to prices, if it occurs, is a better, but still un-

<sup>6</sup> In both cases, concern is with what is termed wheeling, the use of a third party's transmission lines to "transfer" electricity from a generating plant to a customer. Transfer, in practice, means adding to the flow in the transmission lines. The electricity loses its identity, and thus one cannot tag the electricity the way oil and gas through a pipeline can be distinguished.



acceptable, rationale for promoting decreases in consumption. Trying to approximate the effects of a higher price by regulation is another type of regulatory overreach. Advocacy of the policy is an unjustified tacit renunciation of a justly held tenet of economics—consumer sovereignty, the proposition that no one knows better than you what is best for you. The regulator is likely to lack the ability to improve on consumer decisions. Indeed massive tendencies to anticipate continually rising energy prices have produced inefficiently high electricity costs.<sup>7</sup>

Examination of claims that consumers improperly evaluate their options reinforces preference for consumer sovereignty. The demonstrations never come from people responsible for fuel choice. Much of the proof comes from research funded by the DOE, the government agency charged with promoting “conservation.” The main advocate independent from government support, Amory Lovins, is an ideologue whose standard method of proof is to cite a mass of dubious studies. The overreach is best illustrated by the indiscriminate tendency to second-guess even energy managers of large corporations. The assertion that energy costs do not matter enough is belied by the heavy corporate lobbying for more favorable treatment. More generally, where reality conflicts with the estimates of outside observers, anyone aware of the problems of empirical analysis must at least consider that it is the external evaluations, not the decisions, that are incorrect.

A slightly stronger case might be that opportunities exist efficiently to use demand-side management as an alternative to peak-load pricing. However, if such options were readily apparent, again unfettering utilities seems preferable to forcing action.

These experiences suggest that practice confirms theoretic concerns about regulation. Key defects are the inability to devise sensible market structure and the disasters created when policies dependent on accurate forecasts were imposed.

## Restructuring Reconsidered

What should occur under a sensible policy of deregulation is unclear. A key issue with regulator-driven deregulation is where will it end. The optimistic view is that once the changes start, the process will lead inevitably to full deregulation—the experience in transportation reform. The pessimistic view is that the regulators’ reluctance

<sup>7</sup> Joskow (1990) and Joskow and Marron (1992) provide instructive reviews of the problems of the programs.

will severely hinder evolution and overextended battles will prevail—the telephone case. To date, pessimism seems justified.

The basic questions are what types and sizes of power plants will exist as new facilities are added and possibly old ones are phased out and who will own these plants. Another concern is how, by whom, and to whom transmission services will be provided. Finally is the question of what intermediaries, if any, will operate to allow all customers to receive electric power.

The possibilities include first developing a revitalized integrated electric power industry. Organizational gridlock has started to weaken. Mergers consolidated, among other things, what seemed unusually undersized firms in Iowa and Kansas. However, this may be improving passenger railroads just before the emergence of airlines. The opposite extreme of full disintegration might ultimately emerge. Competing transmission companies will move the power to customers. Many may be able to buy their power from generators on a spot or contract basis. Some form of organized spot market may arise. Brokers might arise to provide electricity to those unable economically to secure electricity directly. As technology develops, everyone may be able to dispense with these brokers. Further extensions may emerge. Another concern is what sorts of plants will operate. The observations above about gas use imply that much existing coal and nuclear capacity might survive (at least if NRC stops regulating the latter to death).

Most visions presume the separation of the industry into independent generating, transmitting, and distribution companies (called *gencos*, *transcos*, and *discos*). It is further presumed that generation will be unregulated and regulation will be devised for transmission and generation. This then involves acceptance of Weiss's arguments that generation, but not transmission and distribution, can be competitive. Where disputes arise is in how these organizations interact and in how much freedom each should be granted. Analysts (Brennan et al. 1996) at Resources for the Future distinguished between a system that relied heavily on contractual arrangements and one in which a coordinating company (a *poolco*) operated. The RFF group also noted questions about whether open competition would be allowed among distributors.

The “*poolco*” debate appears to center on radically different visions of the nature of a central pool organizing body. *Poolco* advocates appear to believe that the pool operating agency can be as impersonal and competitive as an organized exchange. Skeptics fear that *poolcos* will possess market power and particularly will protect the position of existing utilities. These attacks draw upon the experience in the

United Kingdom in which the two main generating companies that were spun off when electricity generation was privatized dominated the pool. Given that many more utilities operate in each region of the United States, this danger could be avoided. Critics of the California deregulation effort fear that a one-state poolco would leave too much control with the state's two giant private utilities.

Another difficult, much discussed issue is that of so-called stranded investments—the purportedly massive losses that would arise in a free market.<sup>8</sup> Extensive support has emerged for compensating utilities for such costs. Concerns have also been raised about the effects of restructuring on such policies as demand-side management, integrated resource planning, accounting for externalities, and imposing choices of generating technologies.

Of these issues, only stranded costs need extensive review. The combination of the drawbacks of regulation and the uncertainties about what is optimal imply that that market tests are preferable to regulator-imposed reorganizations. The criticisms above of regulatory initiatives threatened by deregulation indicated that they deserved to be endangered. Thus, those complaining about the possible demise are advocates of retaining undesirable intervention.

The case for recovery of stranded costs has severe, probably fatal weaknesses. Both the desirability and feasibility of compensation are dubious. The costs are in generation and in unrecovered costs of demand-side management efforts. The utilities face two types of overruns in generation—their own investments that cannot recover the sunk costs and the contracts that call for prices above current marginal costs.

Economic theory stresses that bygones are bygones and indicates that markets do not and indeed often cannot guarantee cost recovery. This argument is qualified by warning that avoidable losses such as to expropriation should be resisted because of their chilling effects on future investment. The case for stranded cost recovery is that restructuring is a change that could not have been anticipated. However, the prior sketch of regulatory experience suggests that the confiscations and chills started long ago and further failures to repay are not unexpected shocks.

The case is further weakened by the large role of the cost of independent power and demand-side management programs. The beneficiaries were not part of any regulatory compact and are even

<sup>8</sup> *Regulation* in 1996 contained articles by Niskanen, Michaels, Baumol and Sidak, and Taylor and letters by other specialists that make the critical arguments.

less deserving of protection. Again our experience with fuels suggests that much of the complaining about bad and unbreakable contracts is posturing. That bad contracts were made is undoubtedly true. What is exaggerated is the extent to which the contracts are binding. Economic reality regularly overrides legal rights. Concessions thus will be made as they were in uranium, coal, and natural gas. This will shift much of the loss to nonutility generators and beneficiaries of demand-side programs.

The problem, moreover, probably is grossly overstated. As noted above, many of the highly touted alternatives to the traditional large-scale plants look cheap only because they presently constitute small additions to a giant system. The economic limits to adding such capacity may moderate the losses to existing plants. Whether the magnitude is unmanageable remains to be seen.

Obviously, the possible participants in the cost sharing are the utility company stockholders, the stockholders in the independent power producers, the consumers directly, and the consumers as taxpayers to finance a direct bailout. Coase's argument noted above that it is better to charge consumers directly than through taxation clearly applies to stranded cost recovery. As suggested, it is unclear how much stockholders have already paid the cost by lower stock prices and how much should be absorbed by independent power producers.

In any case, the most possible for those who made the errors is to allow them a higher share of whatever rents can be squeezed out of the system. The economic limit to recovery by charging consumers is that, unless peculiar circumstances that produce multiple solutions arise, only one profit maximizing output exists. The assertion that whether under regulation or free markets "captive" consumers can be made to bear the full costs, therefore, is more economic nonsense. Whatever the policy, the market limits how much can be collected from customers and that limit is unrelated to the losses from bad investments. Whether free-market pricing or even fully monopolistic pricing produces any rents and whether the maximum attainable rents are sufficient to repay investments depends on the degree of monopoly power and the extent to which the utilities own low-cost facilities. To make matters worse, it is unclear that a good correlation exists between where monopoly rents can be secured and where stranded costs occur. It is also unclear that regulation is so effective that it has prevented imposition of profit maximizing prices on captive customers and left unutilized opportunities to raise prices to allow more cost recovery.

Finally, estimating stranded costs is precluded by at least two basic drawbacks of regulation. Among the defects of regulatory accounting

is an inability correctly to calculate actual recovery of capital costs.<sup>9</sup> Thus, we do not have a good estimate of unrecovered investments. An estimate of future revenues is needed to determine how much of these unrecovered costs will be recouped through regular pricing mechanisms. Proposals that losses arising from bad price forecasts can be recovered by a process that requires good forecasts are bizarre. Moreover, the record suggests that the recovery measures will incorporate the ill-advised tinkering characteristic of regulation.

The restructuring experience thus far strongly supports these arguments. The California restructuring effort allegedly failed satisfactorily to provide adequate competition for the state's two dominant electric utilities. Generating plant ownership throughout the country often has transferred to a single buyer, undermining the Weiss objective of creating more sellers. FERC's massive orders to implement its vision of restructuring demonstrate excessive involvement with the details of industry actions.

## Conclusion

All this leads to a preference for massive deregulation. Such deregulation involves the following steps:

1. Eliminate federal, state, and local "public utility" regulation of all phases of electric power.
2. Repeal the Public Utility Holding Company Act.
3. Eliminate the Nuclear Regulatory Commission.<sup>10</sup>
4. Abolish state energy plans.
5. End subsidies to rural cooperatives.
6. Privatize all government-owned power and eliminate preferential access rules.
7. Drop requirements for demand-side management, integrated

<sup>9</sup> The widely cited estimates of stranded costs by analysts at Oak Ridge National Laboratories suffer from uncritical reliance on conventional financial accounting data. As plant sales in response to restructuring initiatives arose in 1999, some were indeed sold for nominal amounts such as \$10 million for nuclear units costing several billion. However, some plants were sold for considerably more than book value. Counterestimates based on market prices of utility stocks rely on overly strong assumptions about market behavior.

<sup>10</sup> The NRC is ineffective; liability law, with the Price-Anderson ceiling on awards removed, is a preferable way to ensure nuclear safety. Analyses by Shavell (1987) of the economics of liability have given theoretic support to this conclusion that was lacking when it was originally made. The original basis was simply that the reviews of NRC performance noted above produced criticisms identical to those made of other regulatory bodies. Nevertheless, NRC remains the most sacred of the many environmental sacred cows.

resource planning, or internalization of costs as part of deregulation.

8. Rationalize environmental regulation.

Adopting these steps will create real deregulation, depoliticize the electric power industry, and benefit consumers. Ending government regulation, not aiming for “better” regulation, is the only way to revitalize the U.S. market for electric power.

## References

- Andrews, C.J. (ed.) (1995) *Regulating Regional Power System*. Westport, Conn.: Quorum Books.
- Baumol, W.J., and Bradford, D.F. (1970) “Optimal Departures from Marginal Cost Pricing.” *American Economic Review* 60 (3) (June): 265–83.
- Baumol, W.J., and Sidak, J.G. (1996) “Recovering Stranded Costs Benefits Consumers.” *Regulation* 19 (2): 12–15.
- Berg, S.V., and Tschirhart, J. (1988) *Natural Monopoly Regulation: Principles and Practice*. Cambridge: Cambridge University Press.
- Brennan, T.J.; Palmer, K.L.; Koop R.J.; Krupnick, A.J.; Stagliano, V.; and Burtraw, D. (1996) *A Shock to the System: Restructuring America’s Electricity Industry*. Washington, D.C.: Resources for the Future.
- Brown, S.J., and Sibley, D.S. (1986) *The Theory of Public Utility Pricing*. Cambridge: Cambridge University Press.
- Chao, H., and Huntington, H.G. (eds.) (1998) *Designing Competitive Electricity Markets*. Boston: Kluwer Academic Publishers.
- Coase, R.H. (1988) *The Firm, the Market and the Law*. Chicago: University of Chicago Press.
- Downs, A. (1957) *An Economic Theory of Democracy*. New York: Harper and Row.
- Edwards, E.O., and Bell, P.W. (1961) *The Theory and Measurement of Business Income*. Berkeley and Los Angeles: University of California Press.
- Fisher, F.M.; McGowan, J.J.; and Greenwood, J.E. (1983) *Folded, Spindled, and Mutilated Economic Analysis and U.S. v. IBM*. Cambridge, Mass.: MIT Press.
- Gordon, R.L. (1982) *Reforming the Regulation of Electric Utilities*. Lexington, Mass.: Lexington Books, D.C. Heath.
- Gordon, R.L. (1986) “Perspectives on Reforming Electric Utility Regulation.” In J.C. Moorhouse (ed.) *Electric Power: Deregulation and the Public Interest*, 447–75. San Francisco: Pacific Research Institute for Public Policy.
- Gordon, R.L. (1992) “The Public Utility Holding Company Act: The Easy Step in Electric Utility Regulatory Reform.” *Regulation* 15 (1): 58–65.
- Hayek, F.A. (1945) “The Uses of Knowledge in Society.” *American Economic Review* 35 (4): 519–30.
- Hayek, F.A. (1976) “The New Confusion about ‘Planning.’” *Morgan Guaranty Survey* January: 4–13. Reprinted in Hayek (1978): 232–46.

- Hayek, F.A. (1978) *New Studies in Philosophy, Politics Economics and the History of Ideas*. Chicago: University of Chicago Press.
- Hotelling, H. (1938) "The General Welfare in Relation to Problems of Taxation of Railway and Utility Rates." *Econometrica* 6: 242–69. Reprinted in K.J. Arrow and T. Scitovsky (eds.) (1969) *Readings in Welfare Economics*, 284–308. Homewood, Ill.: Richard D. Irwin.
- Joskow, P.L. (1990) "Should Conservation Proposals Be Included in Competitive Bidding Program?" In J. Plummer and S. Troppman (eds.) *Competition in Electricity: New Markets and New Structure*, 235–79. Arlington, Va.: Public Utility Reports; and Palo Alto: QED Research. (Reprint of 1988 testimony before a congressional committee.)
- Joskow, P.L., and Marron, D.B. (1992) "What Does a Negawatt Really Cost? Evidence from Utility Conservation Programs." *The Energy Journal* 13 (4): 41–74.
- Joskow, P.L., and Schmalensee, R.L. (1983) *Markets for Power: An Analysis of Electric Utility Deregulation*. Cambridge, Mass.: MIT Press.
- Kwoka, J.E., Jr. (1996) *Power Structure: Ownership, Integration, and Competition in the U.S. Electricity Industry*. Boston-Dordrecht-London: Kluwer Academic Publishers.
- McChesney, F.S., and Shughart, W., II. (eds.) (1995) *The Causes and Consequences of Antitrust: The Public-Choice Perspective*. Chicago: University of Chicago Press.
- Michaels, R.J. (1996) "Stranded Investments, Stranded Intellectuals." *Regulation* 19 (1): 47–51.
- Niskanen, W.A., Jr. (1971) *Bureaucracy and Representative Government*. Chicago: Aldine-Atherton. Reprinted in Niskanen (1994).
- Niskanen, W.A., Jr. (1994) *Bureaucracy and Public Economics*. Aldershot: Edward Elgar.
- Niskanen, W.A., Jr. (1996). "A Case against Both Stranded Cost Recovery and Mandatory Access." *Regulation* 19 (1): 16–17
- Nozick, R. (1974) *Anarchy, State, and Utopia*. New York: Basic Books.
- Peltzman, S. (1976) "Towards a More General Theory of Regulation." *Journal of Law and Economics* 19 (2): 211–40. Reprinted in Peltzman (1998): 155–87.
- Peltzman, S. (1998) *Political Participation and Government Regulation*. Chicago: University of Chicago Press.
- Posner, R.A. (1969) "Natural Monopoly and Its Regulation." *Stanford Law Review* 21 (February): 548–643. (Reprinted 1999, with new foreword, Washington, D.C.: Cato Institute.)
- Posner, R.A. (1974) "Theories of Economic Regulation." *Bell Journal of Economics and Management Science* 5 (2): 335–38.
- Primeaux, W.J., Jr. (1975) "A Reexamination of the Monopoly Market Structure for Electric Utilities." in A. Phillips (ed.) *Promoting Competition in Regulated Markets*: 175–200. Washington, D.C.: The Brookings Institution.
- Primeaux, W.J., Jr. (1986) *Direct Electric Utility Competition: The Natural Monopoly Myth*. New York: Praeger Publishers.
- Ruggles, N. (1949–50) "Recent Developments in the Theory of Marginal Cost Pricing." *Review of Economic Studies* 17: 107–26. Reprinted in R.

- Turvey (ed.) (1968) *Public Enterprise: Selected Readings*, 11–43. Harmondsworth: Penguin Books.
- Schmalensee, R.L. (1979) *The Control of Natural Monopolies*. Lexington, Mass.: Lexington Books, D.C. Heath.
- Schumpeter, J.A. (1950) *Capitalism, Socialism, and Democracy*. 3d ed. New York: Harper & Brothers.
- Shavell, S. (1987) *Economic Analysis of Accident Law*. Cambridge, Mass.: Harvard University Press.
- Sherman, R. (1989) *The Regulation of Monopoly*. Cambridge: Cambridge University Press.
- Spulber, D.F. (1989) *Regulation and Markets*. Cambridge, Mass.: MIT Press.
- Stigler, G.J. (1951) “The Division of Labor is Limited by the Extent of the Market.” *Journal of Political Economy* 59 (3): 185–93. Reprinted in Stigler (1968): 129–41.
- Stigler, G.J. (1968) *The Organization of Industry*. Homewood, Ill.: Richard D. Irwin (available as a paperback from the University of Chicago Press).
- Stigler, G.J. (1971) “The Theory of Economic Regulation.” *Bell Journal of Economics and Management Science* 2 (1): 3–21. Reprinted in Stigler (1975): 114–41.
- Stigler, G.J. (1975) *The Citizen and the State: Essays on Regulation*. Chicago: University of Chicago Press.
- Stigler, G.J. (1987) *The Theory of Price*. 4th ed. New York: Macmillan.
- Taylor, J. (1996) “Electric Utility Reform: Shock Therapy or Managed Competition?” *Regulation* 19 (3): 63–76.
- Train, K.E. (1991) *Optimal Regulation: The Economic Theory of Natural Monopoly*. Cambridge, Mass.: MIT Press.
- U.S. Federal Trade Commission. (1935) *Utility Corporations: Summary Report of the Federal Trade Commission to the Senate of the United States*, Nos. 72A and 73–A. Washington, D.C.: U.S. Government Printing Office.
- Vickrey, W. (1948) “Some Objections to Marginal-Cost Pricing.” *Journal of Political Economy* 56 (2):18–38. Reprinted in R. Arnott, K. Arrow, A. Atkinson, and J. Drèze (eds.) (1994) *Public Economics: Selected Papers by William Vickrey*, 216–39. Cambridge: Cambridge University Press.
- Weiss, L.W. (1975) “Antitrust in the Electric Power Industry.” in A. Phillips (ed.) *Promoting Competition in Regulated Markets*: 138–173. Washington, D.C.: The Brookings Institution.
- Wilson, R. B. (1993) *Nonlinear Pricing*. New York: Oxford University Press.