



Policy Study

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June 1990

Public versus Private: Alternative Ownership Scenarios for Electric Utilities

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Executive Summary

Despite moves toward privatization of electric utilities in the United Kingdom and elsewhere in the United States there are a few pressures in the opposite direction. For example, both New Orleans and San Diego faced proposals for municipal takeover of the privately owned electric utilities serving their cities. Yet is public ownership likely to bring about more efficient operations and net benefits to consumers?

Empirically, there is little to support the view that public ownership would more efficiently supply electricity than privately owned firms. For example, privately owned utilities use more innovative and efficient rate structures than their publicly held counterparts. Moreover, though the data are mixed, the evidence generally supports the view that costs are higher for public enterprises than for private enterprises.

Several practical factors also suggest that municipal takeovers may be ill-advised. First, a municipality must pay just compensation to the privately owned utility. This sum is likely to far exceed the original cost of establishing the utility. Other costs, such as litigation fees and severance damages paid when only part of the utility is acquired will increase the potential burden to municipalities. Second, few municipalities have the relevant experienced staff to manage a utility, which would necessitate hiring consultants, thereby reducing the chances to achieve labor and management savings through a municipal takeover.

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In the past, some pressures from municipal takeover have come as a result of a municipality's access to tax-free bonds and federal tax breaks unavailable to investor-owned utilities. However, recent federal government restrictions on the use of tax-free bonds to acquire privately owned utilities reduce the potential municipal gains from such transactions.

These new restrictions represent a move in the right direction. Indeed, one of the major difficulties of comparing the efficiency of private and public electric utilities in the United States is the existence of subsidies to publicly owned utilities. These include tax breaks and opportunities (albeit now reduced) to employ tax-free financing. These tax breaks and subsidies create the wrong kinds of incentives. They may encourage municipal takeover even of efficiently operated utilities.

The first lesson of this study is the need to end subsidies to publicly owned utilities. The 1986 tax act made a start at this by ending the use of tax-free municipal bonds for a takeover. Similarly, low-cost federal power should be made available to all at market rates. By eliminating these subsidies, comparisons between public and private utilities would be more meaningful, and purely political decisions to retain electric utilities under municipal ownership would be much more difficult. The full magnitude of benefits to be achieved by ending subsidies should be the subject of a full econometric study of these effects.

Introduction

The recent interest in and progress toward privatization of electric utilities in the United Kingdom makes the issue of performance under public or private ownership of considerable practical interest. While several studies have looked at the merits of private versus public ownership of utilities in the past, the problem takes on a new dimension now that privatization and divestiture of the U.K. electricity supply industry is imminent.

In the United States the pace of privatization is much slower, in part because many utilities are already in the private sector. Nonetheless, there have been several privatization proposals, including, for example, proposals to privatize the electric and telephone utilities in Anchorage and an (unsuccessful) proposal to privatize electricity in Kansas City. In addition, economist Douglas Houston recently argued for privatization of TVA.(1) However, in the United States there are a few pressures in the opposite direction, such as the proposed municipal takeover of New Orleans Public Service (2) and the proposal to bring San Diego Gas and Electric (SDG&E) under municipal ownership as an alternative to a possible merger with Southern California Edison (SCE), which would result in the largest utility in the United States.

While the attempted municipal takeover of SDG&E may seem like swimming against the tide of privatization, the notion that municipal takeover may sometimes be a way of increasing efficiency cannot be dismissed out of hand. Many of the arguments for privatization in the United Kingdom are doctrinaire, based upon the belief by the Tory government in the inherent superiority of private over public ownership of enterprises. In reality the case is not completely clear cut.

As we point out below, there are both theoretical and practical arguments in favor of public enterprise. Indeed, public ownership may be more efficient at supplying certain services that would be undersupplied under private ownership. However, a priori and empirically there is little to support this view in the case of electricity. In view of such considerations, a review of the theory and empirical evidence is appropriate, especially given the importance of the SDG&E case and other recent proposals for municipalization of electric utilities.

This paper will analyze the performance of public enterprise versus private enterprise as a provider of services in the traditional public utilities sector. We will also consider the SDG&E case in some detail to illustrate the concepts involved and for interest in its own right. Section I introduces the problem of

interest and states some of the contending views on the effects of ownership structure of utilities on efficiency. Section 1 also develops some of the theoretical considerations underlying the efficiency of public versus private ownership.

Section 2 presents a survey of and commentary on the empirical literature concerned with the comparative efficiency of public versus private provision of utility services. Though the results are not conclusive for the relative efficiency of private over public provision, there is support for the position that private monopoly with regulation is likely to be more efficient than public enterprise. Moreover, given the recent competitive developments in cogeneration, independent generation and transmission markets, there is at least the potential for further competition and efficiency in the context of private, regulated electric utilities.

Section 3 then discusses the merits of public and private ownership of utilities with special reference to proposals for municipal takeover of SDG&E. This includes a discussion of alternatives to municipal takeover, such as changes in regulatory institutions and the introduction of competition into the sale of utility services. Section 4 presents our concluding discussion, including some implications for future research and public policy.

Statement of the Problem

Economic analysis of ownership forms focuses on the effects of ownership on incentives and the attendant efficiency consequences. For example, under private ownership of assets owners have powerful incentives to maintain the assets in such a way as to provide maximum benefits to themselves. To the extent that private ownership clearly identifies and internalizes the benefits from the assets, the owners will have an incentive to operate and maintain the assets in such a way as to maximize these benefits. A central concern here is whether ownership incentives that maximize benefits to the owner also maximize overall economic efficiency.

Let us briefly review the nature of economic efficiency in neoclassical economics.(3) Allocative efficiency derives from the process of maximizing net benefits, which are defined as the difference between total benefits (to producers and consumers) less total costs.(4) Allocative efficiency implies that it is not possible to make one person (whether a consumer or a producer) better off without making another worse off.

Private ownership and profit maximization are generally regarded as efficient under competition because competition drives price toward marginal cost--that is, the excess of benefits over costs is maximized because

consumers are paying exactly the producer's cost of the last unit. By contrast, under monopoly provision of a good or service, profit-maximization results in a price in excess of marginal cost and is therefore allocatively inefficient since the "price equals marginal cost" rule is violated. In addition, the absence of competition may also result in internal inefficiencies. (Such internal, or operating, inefficiency is called x-inefficiency following the work of Harvey Leibenstein) (5) That is, the enterprise may not minimize its total costs at the output it produces.

There is no compelling reason to believe a priori that ownership structure will ameliorate either pricing or cost inefficiencies. Of course, if one assumes that public enterprises maximize the excess of benefits over costs--that is, net benefits--then public enterprise clearly has superior efficiency properties over private monopoly. We pursue below the empirical evidence, pro and con, for the validity of this assumption. In this section, we wish to consider first an appropriate conceptual framework for this discussion. To this end, we begin with a more detailed set of performance criteria, integrating those of the neoclassical approach, which will be useful in comparing public and private ownership. The expanded criteria we propose are as follows:(6)

1. Allocative efficiency, including price efficiency (price equals marginal cost) and x-efficiency, or internal operating efficiency. Allocative efficiency is concerned with the amount of output being produced such that changes will not result in an increase in net benefits. X-efficiency is the more familiar notion of efficiency. It is the idea that a particular level of output can be produced at lower cost.
2. Dynamic efficiency relates to the ability of a particular economic institution to improve its productivity or quality over time through technological innovation, research and development, and continuous improvement of operations.
3. Fairness considers issues of due process, participation, right to a hearing, and perceived even-handedness in setting rates and dealing with customers.
4. Transactions cost efficiency refers to the costs associated with the regulation and governance of a utility, which are likely to be high. These costs are associated with determining and legitimating rates, with capacity planning and financing and, in general, with representing the utility's interests to governing or monitoring bodies external to the utility.

In comparing the performance effects of ownership, the central issue is clearly how managers, and more generally all employees, will operate the enterprise in question. Using a benchmark model analyzed in Privatization: An Economic Analysis, by John Vickers and George Yarrow, (7) we focus only

on managerial activity.(8) Even with all of these simplifications, the following issues relevant to comparing private versus public ownership should be manifest:

1. Incentives: What incentives do managers face under these alternative ownership forms?
2. Behavior: What will the effect of these incentives be in terms of aligning the objectives of managers of the private (or public) firm so that their behavior is consistent with profit- (or welfare) maximization?
3. Competence: Given the incentives and other aspects of the reward structure of public versus private firms, what kind of manager/employee will be attracted to these firms?
4. Monitoring: How will performance be monitored and related to incentives and behavior?
5. Cost: What will the level of cost be under various ownership forms as a function of cost-reducing activities such as investments in technology, R & D, and continuous improvement efforts? While usually the concern is with static efficiency, or efficiency during a particular period, note that the more general issue here is the dynamic efficiency consequences of ownership.
6. Transactions Costs: What will be the transactions costs of alternative ownership forms and their related governance structures? If rate setting or budgeting for cost-reducing activities, for example, are subject to detailed scrutiny by external monitoring authorities (regulatory agencies), and if such scrutiny is different depending on ownership of the firm, then the resulting differential transactions costs will be important to judging the overall efficiency of the ownership form.
7. Fairness: How fair are the rates or service policies of the firm as a function of ownership structure?

It would be beyond the bounds of this short paper to compare private and public ownership on all of the above dimensions.(9) Moreover, theoretical arguments are likely to be less convincing on this issue than empirical evidence in any case, a direction we pursue in Section 2. Nonetheless, the incentive and transactions-cost considerations raised above deserve further comment.

Proponents of private ownership essentially argue that privately owned firms have cost advantages, both internally and in terms of external transactions costs of legitimation and governance. The argument is as follows. Since the managers of public enterprises do not have any ownership interest in the enterprise, they do not have as strong an incentive as the owner-monopolist to maximize profits and minimize costs. Of course, private firms may have incentive alignment problems as well, especially with

ownership separated from control under typical shareholder corporate structures. Shareholders may favor profit maximization, but managers may have other motives, including maximizing their own salary and perquisites. However, the capital market may have a role in disciplining managers to operate at least partially in the shareholders' interests.

In public enterprise, because of the fact that "Ownership interests are extremely diffuse and cannot be sold...there is no incentive to monitor the firm for investment purposes."⁽¹⁰⁾ In addition, with the effective absence of the ultimate sanction of bankruptcy, public enterprise managers can be disciplined not by capital markets but by the political process. And it is not clear (in theory or in practice) that this process will result in greater allocative efficiency. Only to the extent that managers have incentives for efficiency can they be expected to pursue efficiency as a central goal.

As the empirical evidence reviewed below shows, most public enterprises do not apparently explicitly seek to maximize welfare. This may be in part because welfare is difficult to operationalize and monitor (especially when the product or service involved has important quality attributes) and in part because managers of public enterprises may lack incentives to act efficiently. In any case, the basic argument that public enterprises operating as monopolies may not be efficient rests on both the transactions costs of monitoring, and the difficulty of designing effective incentives for the managers of such firms.

The above discussion makes clear that there is no obvious theoretical answer to the question of whether public or private enterprise is likely to be the preferred institutional form for utilities, where strong market competition is typically absent. If civil servants really do attempt to maximize welfare and if they are left relatively free of political entanglements to run the enterprise, then the logic of the earlier models suggests that public enterprise would perform better on traditional efficiency grounds than private enterprise.

However, if public enterprise managers pursue other objectives than welfare maximization, or if they are confronted by complex political constraints on their operations or their pricing policies,⁽¹¹⁾ then private enterprise would tend to perform more efficiently. This suggests that the basic argument here can only be settled empirically, by looking carefully at the evidence on public versus private enterprise performance.

Review of Empirical Evidence

As noted in a recent survey by Vickers and Yarrow,(12) several empirical studies have explored whether public enterprise is more or less efficient than private enterprise. These studies covered other industries in addition to electric utilities, including more competitive industries such as solid waste collection and transportation. Vickers and Yarrow's conclusion is that, under competition, the empirical evidence tends to support the superior performance of private over public enterprise.(13)

However, when the enterprise enjoys some market power, as in the traditional public utility sector of interest here, Vickers and Yarrow suggest caution in judging relative efficiency of public versus private control. They note, for example, that "In the absence of vigorous product market competition, however, the balance of advantage is less clear cut and much will depend upon the effectiveness of regulatory policy."(14)

In general, we do not object to the cautious approach of Vickers and Yarrow. However, we argue in our review of the major studies that there is very little sound empirical support for the notion that public enterprise will provide superior performance relative to regulated investor-owned companies in the utilities sector. In particular, the justification of municipal takeover of a large private utility would be facilitated if there existed a history supporting the superior performance of public over private utilities, at least under some well-specified conditions.

In our view, however, there is insufficient empirical evidence to support significant changes in ownership from private to public. This is not to say that public enterprise may not be superior in some individual cases. The evidence strongly suggests, however, that the burden of proof squarely rests upon the proponents of public takeover.

In comparing public versus private ownership effects, contributors to the literature have considered one or more of the following efficiency comparisons.

Allocative efficiency. Unregulated monopoly would restrict output. Ideally, public enterprise would charge a lower price and provide an (efficient) higher level of output.(15) In practice, regulated monopoly may be prevented from monopoly pricing by its regulators, and public enterprise may not achieve economically efficient pricing because of information, transactions costs, and other reasons. In practice, it may not be possible to

compare allocative efficiencies directly. Some surrogate may have to be employed. For example, time-of-day rates for electricity are generally considered to have superior efficiency properties to time-uniform rates. Thus, we may as a surrogate for allocative efficiency check whether innovative rates, such as time-of-day rates, are used more frequently in public or in private utilities.

Economists Samuel Peltzman and Louis De Alessi essentially took this approach in examining the rates of public and private utilities.(16) They found that time-of-day rates were more prevalent in private utilities. They argued that this may arise because political control and the nature of public bureaucracies would make pricing structures in public enterprise less responsive to change than those in private utilities. For one thing, it may be that public sector managers have to devote more resources to holding on to their offices than managers of private utilities. Moreover, the adversarial nature of the political process and the attendant bureaucracy may make it more difficult for public managers to bring about changes in pricing policies than it is for their private counterparts.

The regulatory process would seem to provide at least prima facie a more flexible mechanism for evaluating price changes than the political process in that regulatory commissions have established legal procedures for evaluating rate requests, and they employ rate specialists who advise the commissions. Where municipal utilities are only accountable to their local elected officials, no such stable procedures or permanent expertise may be available to the elected officials. (17)

Other studies that attempted more direct comparisons of allocative efficiency did not provide strong support for the superiority of public enterprise in allocative efficiency. For example, Scott Atkinson and Robert Halvorsen found no statistical difference between public and private using primarily Federal Power Commission data on 123 private and 30 public electric utilities in 1970.(18) Their results were essentially confirmed in a 1985 study by R. Fare, Shawn A. Grosskopf, and J. Logan, that used the same data.(19) Daniel Hollas and Stanley Stansell's 1988 econometric study of data on investor-owned, privately owned not-for-profit, and municipal utilities in some respects supports the superior efficiency of investor-owned utilities. They conclude that the evidence "generally supports the hypothesis that privately owned...tend to be more price efficient than municipally owned..."(20)

Studies of public enterprise behavior in other industries do not support allocative efficiency. A 1989 study of gas distribution companies by Daniel Hollas found evidence of inefficient rates, with municipals providing lower

peak rates than their privately owned counterparts. In addition, in line with the intuition that municipals may respond less to economic efficiency arguments than to political power, Hollas found that municipals charge lower rates for residential customers, the largest political constituency, than do their privately owned counterparts. He concludes, "change in net social welfare due to municipal operation may be negative as municipal costs are higher than private costs, holding regulatory effects constant."(21)

Government-owned airlines in Europe have shown little reluctance to cartelize the market and to embark upon practices intended to monopolize markets. British Airways's aggressively anticompetitive policies resulted in their losing an antitrust suit brought in the United States. There is little evidence to support the notion that public enterprise is much different from a private monopolist when it comes to competitive practices and therefore by implication to allocative efficiency.

Total-Cost or X-Efficiency. While unregulated monopoly and public enterprise would both be expected to be operationally efficient, there are reasons for believing that rate-of-return regulated monopoly may not be operationally efficient (X-efficient). Harvey Averch and Leland Johnson were among the early contributors to argue that rate-of-return regulation was a potential source of inefficiency. In particular, they argued that rate-of-return regulation leads firms to overinvest in capital equipment--that is, they purchase equipment more expensive than would unregulated firms. Their argument that rate-of-return regulation induces overcapitalization has resulted in considerable debate, and the empirical evidence is mixed.(22)

Shesinski's economic model implies both an attenuation of market power and operating efficiency arising from regulation.(23) So we hypothesize that regulated monopoly would be neither allocatively efficient nor operationally efficient. The question is how it compares relative to public enterprise. Public enterprise does not have an overcapitalization effect resulting from regulation, because it is normally not subject to rate-of-return regulation. However, it still may be subject to overcapitalization arising from the subsidies that it receives from low-interest municipal bonds. In addition, it may be that the incentives for cost control imposed by the political process are weaker than those imposed by more knowledgeable regulators and by financial markets.

We recognize that regulation may weaken incentives for efficiency provided by capital markets for unregulated firms. However, the fact that brokers research regulated firms at least as thoroughly as they do unregulated firms and the fact that such research studies the quality of management and

strength of the firms in their product markets means that the traditional discipline of the financial marketplace is not entirely absent for regulated firms.

In short, both public and private firms are likely to be operationally inefficient. The question is whether public enterprise is likely to be less inefficient. While the empirical evidence is not conclusive, with some exceptions discussed below, the weight of the evidence supports the conclusion that privately owned utilities have no higher costs than publicly owned utilities, in spite of rather significant tax and capital surety advantages enjoyed by municipals.

Two 1970 studies, one by Thomas Gale Moore and one by Richard Wallace and Paul Junk, both support the notion that publicly owned utilities have higher costs than privately owned utilities.(24) However, a study by Robert A. Meyer provided some support for the opposite conclusion that publicly owned utilities have lower costs than privately owned utilities. Similarly, a study by R. Fare, Shawna Grosskopf, and J. Logan argued that public utilities may be more operationally efficient (closer to the efficient production frontier) than private utilities, but their results were not statistically significant.

In a study of two closely matched pairs--Los Angeles Department of Water and Power and SDG&E, and the San Antonio municipal electric utility and Dallas Power and Light--Robert Spann concluded that "the costs of government services would be no more if private producers were substituted for public firms of equal size in this sector."(25) James A. Yunker's 1975 results were suggestive of lower costs by publicly owned utilities, but they were not significant. Likewise, L.G. Neuberg finds distribution costs are lower for public firms, but he assumes a common interest rate across firms, whereas in fact public firms typically enjoy considerable tax and other advantages assuring them lower interest costs on debt capital. Hollas and Stansell conclude "that proprietary utilities operate closest to the cost-minimizing input combination, while municipal utilities are the least cost efficient."

While the above studies usually support the hypothesis that costs are, if anything, higher for public enterprises than for private enterprises, at least one study finds statistically significant cost advantages under public ownership. This is the study by Donn Pescatrice and James Trapani.(26) However, the Pescatrice-Trapani study is flawed, primarily because of measurement problems related to the cost of capital.

The study is, at first reading, compelling because of the magnitude of the differences that Pescatrice and Trapani found. After adjusting for differences in input prices (such as the lower cost of capital of public firms arising from the use of tax free municipal funding), the authors found costs by public firms in the region of 24 to 33 percent lower than those of investor-owned companies. Thus, taken at face value, this study is by far the strongest case for the cost-efficiency of public enterprise.

However, there are a number of serious deficiencies in the approach Pescatrice and Trapani adopt. Their claim to have adjusted for differences in input prices is undermined by their definition of the cost of capital as follows: "The user cost of capital is estimated here as the sum of interest and dividend payments divided by the sum of nominal debt and equity capital."⁽²⁷⁾ This is an inappropriate definition of the cost of capital, among other reasons because the numerator only measures interest and cash dividends to bondholders and shareholders. Other forms of cash distribution and the capital appreciation dimension are excluded. In addition, the denominator is apparently inappropriately stated in terms of book value rather than market value.

Because of these measurement problems, Pescatrice and Trapani's definition of the cost of capital definitely represents a biased estimate and likely underestimates the cost of capital for the privately owned firm. Thus, it is not surprising, at their low estimates of the private firm's cost of capital, that adjusted costs for these firms are higher than those of public firms. In addition to capital measurement problems, there are several data and statistical problems with the Pescatrice-Trapani analysis. Their sample size is very small (33 private and 23 public), particularly given the large number of variables. Moreover, the samples were pooled without indicating any test for the appropriateness of pooling. The samples were apparently not "matched" (as in the De Alessi studies) to help insure that the appropriate comparisons were being made between the different types of firm.

The study by Pescatrice and Trapani is clearly an outlier among the studies of electric utilities, and the reasons for this arise from the data and methodology they employed. Their study stands out in contrast with a 1985 Edison Electric Institute study that comes out with directly opposing results.⁽²⁸⁾ The Edison study, performed by consultants, is workmanlike and not subject to as many obvious problems of execution as the Pescatrice-Trapani study. The report is a mine of statistics and institutional details on all types of publicly owned utilities and investor-owned utilities.

The approach is different from most of the other studies in that it uses financial accounting data from income statements along the lines used by regulators in calculating revenue requirements. They attempt to make balance sheets, income statements, and therefore revenue requirements directly comparable by making adjustments in input prices and taxes. The main changes affect cost of capital, purchases of low-priced federal power, and taxes. The most important general result of these adjustments is the finding that investor-owned utilities have on average a revenue requirement of 9 percent less than municipal utilities, that is, for either pricing reasons or cost-efficiency reasons, the investor-owned utilities require less revenue to run their business.(29)

Our overall conclusion on cost-efficiency is that, based upon the evidence we have reviewed, there is little to support the notion that public enterprise is likely to be more efficient than private, either generally or in the case of electric utilities.(30)

Dynamic Efficiency. A number of studies have compared productivity of public and private enterprise. Mostly, these studies support the notion that privately owned enterprises have superior performance to publicly owned ones. For example, in a British study of airlines, ferries, and the sale of gas and electric appliances R. Pryke found superior profitability, productivity, and greater X-efficiency in the private sector.(31) Two other studies--by P.J. Forsyth and A. Bruce had similar results. Charles Rowley and George Yarrow found a slight deterioration in the performance of British Steel after renationalization.

Empirical Evidence: Conclusion

There is very little evidence to support the hypothesis that public provision is more efficient than private. In the case specifically of electric utilities, while there are some studies that provide evidence of superior efficiency for publicly owned utilities, there are serious problems with these studies. The survey of the evidence clearly does not provide a very strong basis for proposing municipal takeover. From the evidence surveyed there is little support on efficiency grounds for municipal takeover.

Our evaluation of the evidence does not imply that public ownership of SDG&E or other investor-owned utilities would necessarily be inefficient. However, the evidence does not provide us with a prima facie basis for believing that it would be efficient either. We are now ready to turn to our examination of potential efficiency consequences of the proposed public takeover of SDG&E.

Municipalization: The Proposed Takeover of San Diego Gas & Electric

Background: The Southern California Edison (SCE) Takeover of SDG&E

The lack of evidence to support the superior efficiency of public over private provision of utility and other services does not mean that in particular cases public provision is superior to private, or that municipal utilities should be privatized on a wholesale basis.(32) In some instances, ownership might not make much difference either way. For example, the Los Angeles Department of Water and Power, which is highly regarded by both the public and private sector, would probably not function very much more or less efficiently under private ownership. In other instances, private takeover may offer potential for significant improvements in efficiency, as, for example, in the case of Sacramento Municipal Utility District (SMUD).

The question of privatization or municipalization then is mostly handled on a case by case basis. The proposed municipal takeover of SDG&E by the San Diego County Water Authority is one such case in point.

SDG&E is a very important case. It represents a very large proposed takeover. It comes at a time when SDG&E has agreed to merge with SCE to form the largest investor-owned utility in the United States.(33) Indeed, the municipalization proposal was precipitated by the proposed merger of these two neighboring utilities. The municipalization was not inspired by a groundswell of public opinion against SDG&E for gross inefficiencies and inequities in its operations and dealings with the people of San Diego County. Municipalization surfaced with the merger proposals and seemed to stem much more from a dislike and fear of a takeover by Los Angeles, in this case personified by SCE.

Municipalization has become an emotional issue with the citizen's group, Taxpayers Against Government Takeover, springing up against municipal takeover. Thus the effect of the proposed municipal takeover is to provide, at least in the minds of the community, two second- or third-best alternatives, an SCE or a municipal takeover. The first best, from the community perception, would seem to be retention of the status quo, an independent SDG&E, or perhaps a merger with Tucson Electric Power.(34) While this is in principle feasible,(35) it is a choice that seems not to be under the control of the citizenry of San Diego.(36) Accordingly, we will compare the SCE takeover versus municipalization.

SCE's merger proposal is by some accounts an exceedingly generous offer to the stockholders of SDG&E.(37) Following the initial rejection of the offer by

SCE the offer was raised and the Board of SDG&E accepted the terms of the merger. In addition to providing an offer that was freely accepted by SDG&E's shareholders, SCE is on record as promising to pass-through most of the cost savings of the merger to SCE ratepayers.(38) We will first review the relevant SCE testimony on the benefits of the merger to establish a benchmark.

The benefits of the merger derive mainly from cost savings in generation and transmission, and staff savings from being able to combine functions that were previously performed separately in each company. Significant generation savings arise from SCE's being somewhat long on generating capacity and SDG&E's being short of capacity. As a result of the merger, SDG&E will not have to build plants that would have been needed had it stayed independent. While the same result might, in principle, be achieved if the two companies contracted with each other to buy/sell power, additional generation savings arise from the ability to operate as a single system, enabling units to be dispatched to achieve lower fuel costs.

In addition, there will be benefits from operating the transmission system more efficiently, reducing operating costs and losses, and providing the potential from deferring investment in transmission lines. Annual savings in operating costs are estimated at \$28 million starting in 1990, and reduction in capital expenditures during the 1990s are estimated to total \$370 million.(39) Savings in administration and management of the company result in company-estimated cumulative savings of \$1.7 billion through the year 2000. At a 10 percent discount rate the present value of the cost savings is \$0.9 billion.

These savings are significant, and SCE is on record with testimony not only in estimating them out but also in promising SDG&E ratepayers the lion's share of such benefits. For example, of estimated savings of \$144 million in 1993 \$110 million are to be flowed through to SDG&E customers. The effect on rates of flowing through such benefits results in a reduction in the 1990-93 period of \$379 million or 10 percent for SDG&E residential customers and a reduction of \$124 million or 5 percent for other SDG&E customers. By contrast SCE customer get a very small reduction of \$68 million, or less than 1 percent.

SCE, in addition, is on record as promising to maintain a presence in the SDG&E headquarters building in San Diego, to provide equal treatment to SDG&E employees, to increase its contributions to local San Diego area charities, and to provide other minor benefits. At least for the initial years, SCE is promising significant benefits from the merger and promising to flow

the majority of such benefits through to SDG&E ratepayers. The fact that SCE is on record as testifying not only to significant benefits but also to the division of these lends considerable credence to their claims. Indeed, it seems likely that the benefits may be understated

Prudence would dictate that the benefits would not be overstated, because SCE has promised rate reductions. It has made a commitment. In the absence of savings of the magnitude claimed, SCE could attempt to renege on the promised rate reduction. In that event it seems unlikely that it could find arguments that would cut much ice with the California Public Utility Commission. The CPUC would argue that SCE offered these rate reductions as an incentive for the CPUC to approve the merger. In short, it seems very unlikely that SDG&E ratepayers will not get their share of the benefits in terms of the rate reduction promised.

Municipal Takeover

The way SCE and SDG&E have structured the merger requires a very high standard of performance by a municipal utility taking over SDG&E. This is particularly true because SCE has provided "guaranteed" rate reductions, while the proposed municipal operation could only provide prospective gains. Looked at only in terms of the effects on SDG&E ratepayers, it may be possible by a combination of tax benefits and subsidies that a municipal utility could provide lower rates than those now being offered by the merged company, if SDG&E could be acquired at a sufficiently low price. However, if it wishes to takeover SDG&E's property, a public authority has to pay just compensation. Given SDG&E's unwillingness to sell to a municipal buyer, because it already has a buyer with whom it has reached agreement, a negotiated settlement of a purchase price is unlikely, especially if the municipality offers, as seems likely, less than the SCE bid. In addition, while SCE is not directly involved, at least until the merger is consummated, it is unlikely that SCE would stand idly by during a municipal takeover of its most important investment. Thus a municipal takeover will almost certainly result in litigation.⁽⁴⁰⁾ We will now outline some of the legal and economic considerations involved in determining such compensation relevant to a litigated settlement.

The most important restriction on a public authority's power to condemn private property in eminent domain proceedings is the constitutional argument that just compensation be paid. In addition, the condemnation must be for a public purpose. In California, and most other jurisdictions, the courts have used fair market value as a basis for determining just compensation. In determining the value of SDG&E to be paid by the public authority as just compensation, both sides would present different estimates

of the value of the company and might employ several valuation methodologies. While the acquiring public authority might argue that original or historic cost was the appropriate basis for valuation SDG&E might argue for a number of alternative methodologies. Given its acceptance of the SCE bid there would be powerful arguments for this basis as starting point. This would far exceed original cost.

Another methodology that might be employed is "reproduction cost new less depreciation" (RCNLD). This basis is often accepted by municipalities as a basis for valuation in the event of takeover. In the case of SDG&E this methodology would promise to provide not only the prospect of a very high value for the company but also the potential for extremely high administrative and legal costs by both sides. Take just one example of easements. To run its wires across an individual's property the utility requires an easement. When many of the easements were obtained San Diego was a much smaller city and easement were given for large tracts of land that have now been subdivided into many lots. To reproduce such easements that were acquired for little or nothing years ago would require hundreds or thousands of new easements covering the individual lots into which the property is now divided. The expense of obtaining easements now would be considerable. Using the RCNLD methodology it would be possible to argue for such a treatment and valuation for all of the property of SDG&E. The result would be place a high valuation on the company perhaps even higher than the SCE bid.

Although market value might be very persuasive in court, it is certainly not conclusive, and both sides would be free to propose their respective methodologies in condemnation proceedings. The implication of all this is that the legal and administrative costs of the procedures involved would be considerable in the event of litigation.

Other issues in the valuation of SDG&E would arise. Severance damages are often an issue in condemnation proceedings. Severance damages are the additional expense that the company incurs as a result of the severance of this part of the property from the whole. Thus, where a municipality takes over a part of a utility's system the remaining system may be more expensive to operate for a number of reasons: because generating plants cannot be dispatched as efficiently, or because transmission lines are no longer needed or not used as much, or because line losses are created, or because of many other reasons related to the operation of an integrated system.

In the SDG&E case, the issue of severance damages may arise in a number of ways. SDG&E's territory is not confined to San Diego County. For example, it includes a small part of southern Orange County. If the municipal takeover vehicle is to operate only in San Diego County, SDG&E's investment outside of San Diego County is very much reduced in value, separated as it would be from the body of the SDG&E system. Severance damages might arise here to reflect the reduced value of SDG&E's other territory.

The litigation costs of a municipal takeover of SDG&E would be considerable, because delays could run into a few years. It is conceivable that litigation costs might be reduced if the valuation of the compensation were undertaken through the CPUC rather than the Superior Court of California, to the extent that the less formal administrative proceedings of the CPUC promise to be less costly. In addition, the CPUC's decisions can only be appealed to the California Supreme Court, while the Superior Court's rulings can be appealed to the California District Court of Appeal.(41) If the municipality prevailed and acquired SDG&E for something close to the SCE offer the costs would be considerable not only in direct legal and administrative expense but also in terms of the economies lost as a result of the merger.

Following the settlement of the compensation issues problems of operating the municipal entity would arise. During the long drawn out legal battle over just compensation many of the management team would leave the company. The municipality would have to start managing a business with which it had little familiarity. It would not be like a corporate takeover. In corporate takeovers, the acquiring firm either is in the business already, knows the business, or at minimum knows how to operate a business. In this case, none of this kind of expertise is present. The San Diego County Water Authority is very small compared to SDG&E, with only 59 employees as of June 30, 1988. It has no experience in running a large utility. By hiring consultants it might be able to hire management quickly for its newly acquired electric utility. Even in this event it would have to rely considerably on existing SDG&E management and labor. Thus the likelihood of potential labor and management savings from a municipal takeover are slim.

Another consequence of municipal takeover is that most of the economies of the SCE merger are forgone. It is possible that negotiation with SCE contracts for Edison to supply some power to the municipal utility could be negotiated. On the face of it, SCE has a potential to gain from trade, since it is longish on capacity, and the municipality can gain because it is short. However, in the absence of a change in the law the municipality would have no power of eminent domain or the equivalent to make the company sell it power. SCE nevertheless may sell, but very likely the terms would offer a smaller share

of the benefits to the San Diego ratepayers than currently promised by the merger. SCE would no longer have any incentive to "sell" the merger to the community but would have every incentive to strike the toughest bargain with the municipal entity. Moreover, the benefits from operating as an integrated system would be lost reducing the total benefits available for distribution.

On solely allocative efficiency considerations the municipal takeover looks like a loser in terms of legal and administrative expense to set up the operation and in terms of the economies of the merger that will be forgone. The only way that these lost benefits could be recovered would be if the municipal utility were likely to operate considerably more efficiently than the merged private utility. The majority of the evidence outlined in Section 3 does not support this prospect.

The performance of leading municipally owned utilities, like the Los Angeles Department of Power and Water is comparable, but not superior to, leading investor-owned utilities. At best, the municipal utility would be as efficient as LADWP. However, the likelihood is that it would not be as efficient. Given the struggle to take over the utility, it is very unlikely that management of the utility would be given the freedom from day-to-day control by the city and county that the LADWP has. (42) On efficiency grounds the municipalization of SDG&E has little to recommend it.

There may be other reasons from the narrow point of view of San Diego County residents that the takeover may be beneficial. If the municipality, as a result of tax free bonds, federal tax breaks unavailable to investor-owned utilities, and the like, were able to offer lower rates than the merged firm, this would indeed be a benefit to San Diego ratepayers. However, recent federal government restrictions on the use of tax-free municipal bonds to acquire existing privately owned utilities very much reduce the potential transfer to municipal utilities that are created in the future, including the San Diego ratepayers in this case. Even with tax-free municipal funding, LADWP does not provide rates dramatically below the existing rates of SCE. It is unlikely that the San Diego municipal utility would be as efficiently operated as LADWP, at least until it had developed the managerial and operating expertise. With the rate reductions promised by SCE, SDG&E rates are going to be close to those of LADWP, making it very unlikely that a municipal undertaking can do any better for ratepayers than the merged company.

Although it claims total benefits over the period 1989-2001 to San Diego electric ratepayers(43) of a maximum of \$2.6 billion, (in present value terms), in part the "Beck Report," a report commissioned by San Diego County

to review the feasibility of municipal takeover, implicitly recognizes some of the problems involved in municipalizing SDG&E.(44) Indeed, the report argues that its predicted rate reductions in the range 3.7 to 10.7 percent depending on acquisition cost "are lower than have been demonstrated nationwide and statewide for mature publicly-owned versus investor-owned utilities."(45)

Even with this caution the Beck Report provides a weak basis for going forward in the light of the evidence on the relative performance of public and private utilities. The approach of the Beck Report is to use SDG&E projections of revenues and costs, to lower revenues to reflect lower rates, and to lower operating costs "to reflect the differences resulting from public ownership. The most important of these include lower costs for financing capital improvement and elimination of state and federal taxes."(46) (emphasis added) Thus, the report is apparently assuming that a publicly operated entity would have the same operating efficiency as SDG&E. Based on the evidence, this is not obvious. Indeed, it seems highly unlikely, if another Beck-predicted cost saving arising from the public enterprise's recruiting top management at lower rates than SDG&E is put into effect.(47)

The potential gains to San Diego ratepayers from municipal takeover of SDG&E seem rather small and highly tenuous even with the significant state and federal subsidies assumed by Beck. Thus, purely on selfish local grounds the takeover does not look attractive. On allocative efficiency grounds it looks even worse. However, the proposal for public takeover may be withering on the vine according to the reports of a number of local newspapers at the time of the announcement of the Beck Report. This may mean that an inefficient local government decision of major proportions has been avoided. Public takeover of SDG&E did not promise to be either efficient or even a transfer that would have provided significant benefits to SDG&E ratepayers.

Evaluation of Municipal Takeover and Privatization

Based upon the empirical evidence at least in the case of publicly owned electric utilities it is not possible to reject the (null) hypothesis that there is no difference in efficiency between publicly owned and privately owned electric utilities. While it is not possible to dismiss outright the notion that public enterprise is more efficient than private enterprise, based upon our earlier arguments we think this is very unlikely. Similarly, while there may be cases when a municipal takeover enhances efficiency, again we expect such cases to be few and far between, and we do not expect the municipal takeover of SDG&E to be one of them. We are not naive or doctrinaire

advocates of privatization either. If we are advocates, it is of economic efficiency. In view of this, what are the lessons and implications for efficiency and future research of our study?

One of the major difficulties of comparing the efficiency of private and public electric utilities in the United States is the existence of subsidies to publicly owned utilities. These include, for example, tax breaks and the opportunities (albeit reduced) to employ tax-free funding. These tax breaks and subsidies create the wrong kinds of incentives. They may encourage municipal takeover of even efficiently operated utilities, because they make possible lower--and often considerably lower--rates to municipal utilities. (Even with these subsidies the SDG&E takeover promised significantly below-average benefits to SDG&E ratepayers.)

The first lesson of this study is the ending of subsidies to publicly owned utilities. The 1986 Tax Act made a start at this by ending the use of tax free municipal bonds for a takeover. The details of how to end the subsidy would require study. Normally for a change as drastic as this there would be a transition period. It may be that all bonds as they matured would have to be replaced with taxable bonds. Another alternative would be to require municipal utilities to retire their tax-free bonds over a period of say 5 to 10 years.

Similarly, low-cost federal power should be made available to all at market rates. As a result, municipal and other publicly owned utilities would eventually become free of all subsidies. The privatization or municipalization decisions could then be made on their merits. A small municipality might find it more attractive to sell its utility to an investor-owned company. It may get both a better return on its investment and lower rates from such a sale. It may in some cases sell to another municipally owned utility. For example, one of the smaller municipal utilities in the Los Angeles areas may find a sale to the LADWP more attractive than a sale to SCE. Even successful municipal utilities, like LADWP, might be offered for sale. It is possible that a takeover by the mega-utility, SCE, might be advantageous to the City of Los Angeles, in terms of the price received for its investments, and the rates offered to ratepayers.

In view of the magnitude of the capital employed by the electric utility industry, the potential efficiency gains from ending subsidies promise to be considerable. The exact magnitude would require further study. Such research would involve econometric engineering and accounting cost studies to arrive at the magnitude involved and then a translation of them into efficient rates. Such studies would also need to review the nature of scale

and scope economies in electric utilities. While it seems very unlikely that scale economies are so small that ceteris paribus a municipality with 100 megawatts of demand can operate at lower costs than SCE,(48) further study is needed to determine the magnitudes of potential savings.(49) These kinds of studies would make possible the estimation of the kinds of benefits of ending subsidies.

In addition, there would need to be some kind of estimate of the transactions costs involved in this kind of restructuring. The likelihood is that transactions costs would be lower than currently. The present arrangement provides an incentive for public takeover of private utilities. Such takeovers will frequently be litigated, because the private utility is an unwilling party to condemnation of its property. However, our proposal involves no compulsion. If SCE wanted to put in a bid for LADWP, it would be free to do so, and LADWP's owners could consider it on its merits.

The lessons of this study and the SDG&E municipalization go far beyond the situation of San Diego or even Southern California. The incentives for municipal ownership stem from the subsidies provided by the ability to use tax-free municipal bonds and subsidized power. The recent reform prohibiting the use of tax-free financing for takeovers is a major step in the right direction. We propose going further than this and ending all subsidies. In particular, all federally generated power should be available to all at market prices. In this way, comparisons between public and private would be more meaningful, and purely political decisions to retain electric utilities under municipal ownership would be much more difficult. While further research is needed to work out the details, we expect that significant efficiency gains would occur as a result of these kinds of reforms.

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This paper was prepared with the partial support of the Reason Foundation as a contribution to the general debate on private versus public ownership of utilities and the specific debate on this question concerning the San Diego Gas & Electric Company. The authors would like to thank Lynn Scarlett of the Reason Foundation for her very careful reading of the paper and her many useful comments. In addition they would like to thank Ash Collins, Paul Engstrand, Janet Pack, Mary Wood, Larry Schelhorse, Tom Gilfoy, Bob Schuman, and Dennis Whitney for providing various documents and for helpful discussion.

NOTES

1. Douglas Houston, "Privatization of TVA," in Michael A. Crew (ed.), Competition and Regulation of Utilities (Boston: Kluwer, forthcoming).
2. While privatization rather than public ownership seems currently to be in the ascendancy, [see for example, Paul MacAvoy, W.T. Stanbury, George Yarrow, and Richard J. Zeckhauser, Privatization and State-Owned Enterprises, Kluwer Academic Publishers, Boston, 1989], municipalization is not entirely dead, notably the proposed municipal takeover by the City of New Orleans of New Orleans Public Service currently owned by Entergy, Inc. (formerly Middle South Utilities). New Orleans Public Service is regulated not by the Louisiana Public Service Commission but by the New Orleans City Council. In this respect it is closer to a municipal than an investor-owned utility.
3. Since our purpose here is only to survey results related to ownership structure in the public utilities area, we will not be reviewing any of the refinements related to general equilibrium or competition in defining efficiency, but rather we will confine our attention to the standard welfare function based on the additive form of (1). For a more detailed discussion of allocative efficiency and its relation to the utilities sector, see Michael Crew and Paul Kleindorfer, The Economics of Public Utility Regulation, MIT Press, Cambridge, 1986. For a discussion of efficiency and industry structure more generally, see W.J. Baumol, J.C. Panzar and R.D. Willig, Contestable Markets and the Theory of Industry Structure (New York: Harcourt Brace Jovanovich, 1982).
4. (1) $W = TR + S - TC$, where
W = Net benefits
TR + S = Total Benefits, the sum of
TR = Total Revenue and
S = Consumer Surplus.
TC = Total Cost
The welfare function (1) consists of the sum of consumer benefits (S) and producer benefits (TR - TC). Maximizing (1) results in the famous rule that price (P) should be set equal to marginal cost (MC), and total cost should be

minimized at the output corresponding to $P = MC$. Marginal cost pricing and efficient (i.e., minimum cost) production result in allocative efficiency.

5. H. Leibenstein [1966], "Allocative Efficiency versus X-Efficiency," American Economic Review 56 (June): 392-415.

6. The approach draws upon the work of Oliver E. Williamson, Markets and Hierarchies (New York: The Free Press, 1975); Oliver Williamson, The Economic Institutions of Capitalism (New York: The Free Press, 1985); as well as our earlier work, Crew and Kleindorfer [1986], Chapter 7, to which the reader is referred for a more detailed discussion.

7. J. Vickers and G. Yarrow, Privatization: An Economic Analysis (Cambridge, Mass.: MIT Press, 1988), pp. 35-39.

8. We imagine a privately owned utility in which the manager maximizes

$$(2) \quad A(q,x) = Z(q,x) - (a-1)x = [P(q) - C(x)]q - ax,$$

where Z is total profit ($TR - TC$ as in (1)), q is the output level, $P(q)$ is the inverse demand function, $C(x)$ is unit cost and x is expenditure on cost-reducing activities. The parameter a measures the perceived cost to the manager of such cost-reducing activities. In the notation of (1), $TC(q,x) = C(x)q + x$ and profits $TR - TC$ are therefore $Z(q,x) = A(q,x) + (a-1)x$. Thus, if $a > 1$, the manager treats cost-reducing expenditures as more costly than they actually are (e.g., because of effort required of the manager in implementing cost-reducing activities). Of course, if the manager were the owner, then the incentives for profit-maximization (i.e., for behaving as if $a = 1$) would be undiluted. The point of (2) is simply to allow for incomplete alignment of the manager's and owner's preferences, thereby allowing the manager to depart from strict cost-minimizing, profit-maximizing behavior.

Now suppose the firm above were put under public ownership and the manager(s) maximized, instead of (2), the following objective:

$$(3) \quad B(q,x) = S(q,x) + Z(q,x) - (b-1)x = V(q) - C(x)q - bx,$$

where $S(q,x)$ is consumer surplus (as in (1)), and $V(q) = S + TR = S(q) + P(q)q$. As above, $TC(q,x) = C(x)q + x$, so that $B(q,x)$ is just total net benefits $W(q,x)$ in (1) precisely when $b = 1$. If $b > 1$, the manager of the public firm perceives cost-reducing activities to be more costly than they actually are, again for presumed reasons of nonalignment of the manager's incentives with those of the selfless public servant (who would attempt to maximize $W(q,x)$). Thus, the extent to which the parameter b differs from unity measures the

divergence of managerial objectives from social objectives (as measured by total net benefits $W(q,x)$). Such a divergence could come about for a number of reasons: paying employees more for political reasons (thus increasing the cost of cost-reducing activities), managerial inefficiencies or ineptitude (or assigning nonutility-related duties to managers of municipal utilities), inefficient allocation of town office buildings, or transactions costs of legitimating to public authorities that the public's monies were being spent properly. The Illinois Commerce Commission, in a December 1987 study, "Electric Wheeling in Illinois," concluded from its studies that "the profit motive was found to be a crucial factor for controlling the costs of a business."

Comparing (2) and (3), we can see the basic issue associated with ownership incentives. If $a < b$, then private ownership will induce behavior closer to cost minimization than under public ownership, and the converse applies when $a > b$. However, as formulated above, the public firm in this benchmark model has an advantage in that (3) assumes that, for a given level of cost, the public firm will at least choose price efficiently (namely $P = C(x)$), whereas the private manager has an incentive to set $P > C(x)$. Thus, if $a = b$, public ownership is still to be preferred under the simple model (2)-(3). 9. See Chapter 7 of Crew and Kleindorfer [1986] and Vickers and Yarrow [1988] for a detailed discussion and comparative institutional assessment of various governance structures for utilities, including regulated investor-ownership and regulated public ownership.

10. Richard J. Zeckhauser and Murray Horn, "The Control and Performance of State-Owned Enterprises," in MacAvoy, et al. (ed).

11. That such political constraints on many public enterprises are a reality is borne out by the rich literature on public choice, e.g. the journal, Public Choice, and the literature on rent seeking, pioneered by Gordon Tullock, "The Welfare Costs of Tariffs, Monopolies and Thefts," Western Economic Journal 5 (June 1967): 224-32.

12. Vickers and Yarrow, pp. 39-41.

13. Ibid.

14. Ibid., p. 44.

15. Of course, in the presence of natural monopoly some alternative such as Ramsey pricing or economically efficient second best pricing would be .

employed. We do not concern ourselves directly with this issue at this stage. For details see Crew and Kleindorfer [1986].

16. See S. Peltzman, "Pricing in Public and Private Electric Utilities in the United States," Journal of Law and Economics 14 (1971): 109-48, and L. De Alessi, "Ownership and Peak Load Pricing in the Electric Power Industry," Quarterly Review of Economics and Business 17 (Winter 1977): 7-26.

17. As one example, consider recent rate hikes proposed by the Sacramento Municipal Utility District (SMUD). In December 1989, SMUD, "ignoring a staff cost-of service analysis--voted to impose most of an average 7.5 percent rate increase on nonresidential customers. The cost-of-service study found that large commercial and industrial customers were subsidizing residential." One industrial customer, Intel Corp., responded by noting that they now pay 11% higher than PG&E's (the investor-owned utility) equivalent charges. A spokesman for Intel noted, "How do you plan for the future when SMUD has shown that they don't care for cost-of-service, a principle that every other utility in the country sets rates by?" The spokesman then claimed that SMUD "sets rates politically."

18. S.E. Atkinson and R. Halvorsen, "The Relative Efficiency of Public and Private Firms," Journal of Public Economics 29 (April 1986): 281-94.

19. R. Fare, S. Grosskopf and J. Logan., "The Relative Performance of Publicly Owned and Privately Owned Electric Utilities," Journal of Public Economics 26 (1985): 89-106.

20. Daniel R. Hollas, and Stanley R. Stansell, "An Examination of the Effect of Ownership Forms on Price Efficiency: Proprietary, Cooperatives, and Municipal Utilities," Southern Economic Journal 55 (October 1988): 349.

21. Daniel R. Hollas, "Firm and Interruptible Pricing Patterns: Public versus Private Gas Distribution Utilities," Unpublished manuscript, University of Texas at San Antonio, 1989, p. 16.

22. The technical details are beyond the scope of this paper. The basic idea is that the regulated firm will be biased toward excessive amounts of capital compared to the unregulated firm. See Crew and Kleindorfer [1978, 1986] for details and a survey of the evidence on the A-J effect. While the empirical results are not conclusive there are some reasons to believe that RoR regulation induces X-inefficiency.

23. E. Shesinski, "Welfare Aspects of a Regulatory Constraint," American Economic Review 61 (March 1971): 175-178.

24. References on this paragraph are to: T.G. Moore, "The Effectiveness of Regulation of Electric Utility Prices," Southern Economic Journal 36, April 1970: 365-375; R.L. Wallace and P.E. Junk, "Economic Inefficiency of Small Municipal Electric Generating Systems," Land Economics 46 (Nov. 1970): 98-104; R.A. Meyer, "Publicly Owned Versus Privately Owned Utilities: A Policy Choice," 57 (November 1975): 391-399; and Fare, et al., pp. 89-106.
25. Studies cited in this paragraph are: R.M. Spann, "Public Versus Private Provisions of Government Services," in T. Borchedding, Ed, Budgets and Bureaucrats, Duke University Press, 1977; J.A. Yunker, "Economic Performance of Public and Private Enterprises: The Case of U.S. electric Utilities," Journal of Economics and Business (1975): 60-67; L.G. Neuberg., "Two Issues in the Municipal Ownership of Electric Power Distribution Systems," The Bell Journal of Economics (Spring 1977): 303-323; Hollis and Stansell, p. 348.
26. D.R. Pescatrice and J.M. Trapani, "The Performance and Objectives of Public and Private Utilities Operating in the United States," Journal of Public Economics 133 (1980): 259-276.
27. *Ibid.*, p. 275.
28. Edison Electric Institute, Analysis of Differences Among Alternative Forms of Utility Ownership in the United States, Washington, D.C., 1985.
29. Public Power, July/August 1988 shows lower costs for investor owned than municipally owned systems. For example, production costs are 27.30 mills per kwh versus 30.50. Such aggregated figures may not mean much for comparative purposes but the direction is of at least passing interest.
30. To be more precise we are not prepared to reflect the null hypothesis that there is no difference in cost efficiency between public and private electric utilities.
31. R. Pryke, "The Comparative Performance of Public and Private Enterprise," Fiscal Studies 8 (1982): 68-81; P.J. Forsyth and C.C. Findlay, Competitiveness in Internationally Traded Services: The Case of Air Transport, ASEAN - Australia Joint Research Project, 1984; A. Bruce, "State to Private Sector Disinvestment; The case for Sealink," in J. Coyne and M. Wright (eds.), Disinvestment and Strategic Change (Oxford: Phillip Allen, 1986).
32. The tax-free municipal bonding, freedom from subsidies, availability of below-cost federal power are not in themselves reasons for privatization,

because government in principle is free to end these inefficiencies and inequities without resorting to wholesale private.

33. SDG&E was an attractive property not just to SCE. The first attempt at a takeover by SCE was rebuffed in July 1988, as SDG&E was then in the process of completing negotiations with Tucson Electric Power Company. Only after raising its offer on three occasions from 1.15 share of SCE to 1.3 shares did the SDG&E Board finally recommend acceptance.

34. Peter Navarro, "Tucson Merger is the Logical One," Los Angeles Times, October 22, 1989. Navarro argued that the now-abandoned proposal to merge with Tucson Electric Power should be reviewed in that it would offer the potential of lower rates in San Diego. Navarro is Chairman of Prevent Los Angelization Now.

35. Navarro [1989] refers to a "drop dead" clause in the merger agreement which allows SDG&E to terminate the merger in March 1990. However, Navarro argues that "golden parachutes" make this course of action unlikely.

36. The California Public Utilities Commission has still to decide whether the merger is to be allowed. Any antitrust suit to prevent the merger, while feasible, seems unlikely to succeed.

37. H.E. Thompson and D. Ray, "Fifty in Five: The Prospects for Merger in the Electric Utility Industry," unpublished manuscript, University of Wisconsin, Madison, 1989.

38. John E. Bryson, Executive Vice President of SCE, and formerly President of the California Public Utilities Commission in testimony "Edison's Merger Objectives and Corporate Policies After The Merger" (April 1989) summarizes the benefits of the merger and addresses possible concerns of the San Diego ratepayers.

39. See Testimony by V.S. Budhreja, G.P. Gacbe, and R.A. Krumvieda, "Systems Operations and Planning: Benefits of the Merger," April 1989.

40. Litigation has already begun. SDG&E sought unsuccessfully to enjoin the San Diego County Water Authority from commissioning a study by R.W. Beck to investigate the feasibility of municipal takeover. Thus from the beginning SDG&E has clearly regarded the San Diego County Water Authority as an unattractive suitor. It seems very unlikely that a negotiated settlement could be reached.

41. While the CPUC may have more industry-specific expertise than the Superior Court, it is going to use this expertise to attempt to ascertain the

effects of municipalization on the ratepayers that remain under CPUC jurisdiction. Such considerations may increase compensation payable by way of severance damages. All things considered there may be no great advantages for the municipality in choosing the CPUC option. For a brief non-technical introduction to these processes, see Rauscher Pierce Refsnes, Inc [1989].

42. Sacramento Municipal Utility District provides a counterexample of the kinds of management inefficiencies a publicly owned utility may face. For example, over the past four years SMUD has had 3 Board presidents, 4 general managers, 4 senior nuclear executives, and 5 plant managers. SMUD had a 25% turnover of its systems engineers in 1989 and a 12% overall turnover, compared to an industry-wide average of 4.9% per year.

43. The Gas ratepayers would realize a total of \$453 million.

44. SDG&E Study: Public Ownership Alternatives, prepared by R.W. Beck and Associates, preliminary draft, October 1989.

45. Ibid., p. VII-2.

46. Ibid., p. V-19.

47. Ibid., p. I-8.

48. The size of the merged SCE-SDG&E will create so large an entity as to put us in uncharted territory. Indeed it is possible the such an entity may be so large as to enter the region of diseconomies of scale. However, Edison is on record to the contrary and has put its money where its mouth is on the proposed benefits.

49. See Baumol, Panzar and Willig [1982] which examines some of the problems of many existing econometric studies arising in multi-product industries.