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Private Ownership and Limits to Retroactive Regulation of Utility Rates

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Private Ownership and Limits to Retroactive Regulation of Utility Rates

LOUIS DE ALESSI*

The author critically evaluates the effect of retroactive ratemaking on regulated public utilities, particularly the costs and disincentives inherent in the process. If the trend is not corrected, the author suggests that public utilities will ultimately become much like nationalized industries, with consumers bearing the risk and regulators managing the firm.

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I. Introduction

State regulation of public utilities is becoming an increasingly important national issue. Although the degree of regulation has varied greatly from industry to industry as well as over time and across states, until recently the economic consequences of state regulation have been relatively minor and localized.¹ In the past few years, however, a persistently high rate of inflation, the emergence of activist consumer interest groups, and increasingly pervasive federal policies have combined to raise the possibility of seri-

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1. See, e.g., De Alessi, *An Economic Analysis of Government Ownership and Regulation: Theory and the Evidence from the Electric Power Industry*, 19 PUB. CHOICE 1 (1974); Stigler & Friedland, *What Can the Regulators Regulate? The Case of Electricity*, 5 J.L. & ECON. 1 (1962).

ous disruption in the provision of utility services.² The introduction of retroactive ratemaking³ threatens to impose further strains on utilities.

Inflation is an increase in the general level of prices, including the prices of inventories and capital assets. During inflationary periods, business accounting records—which reflect historical costs—systematically understate the value of assets acquired in preceding periods. This phenomenon is particularly significant in the case of public utilities because their production is so highly capital intensive. Thus, if a utility's allowed rate of return is tied to a rate base that understates the increase in asset prices, then the utility's real earnings will be insufficient to compensate investors, maintain the capital stock, and attract new funds for system expansion.⁴

Recently, the disruptive effects of inflation have been compounded by the emergence of consumer groups that have pressured regulatory agencies to limit price increases.⁵ To the extent, however, that these consumer groups have succeeded in preventing output prices from keeping pace with increases in the opportunity cost of the resources used in production, this apparent gain to consumers has been deceptive. To maintain production, utilities have had to reduce costs. In many cases, cost reductions have been obtained by lowering the quality of output,⁶ decreasing maintenance, and postponing equipment replacement, thereby depleting capital stock⁷ and increasing the prospective severity and frequency of system failures (e.g., blackouts). Moreover, the increased national interdependence of electric utilities suggests that some of the disruptions will have national as well as regional impact.⁸ In this con-

2. The Consumer Price Index for Urban Wage Earners and Clerical Workers, a statistical measure of the average change in prices of a fixed market basket of goods and services, more than doubled between 1972 and 1981 from 125.3 to 281.1. See 105 MONTHLY LAB. REV., March 1982, at 57-77. At the same time, the ascendancy of self-appointed consumer groups combined with swings in national policies relating to matters such as the environment, oil, and nuclear power to buffet individual utilities. See, e.g., Navarro, *Electric Utility Regulation and National Policy*, 4 REG. 20 (1981).

3. Retroactive ratemaking refers to the authority of a public utility commission to review a utility's rate structure and to reduce a utility's prices retroactively to the date the rate proceedings began.

4. See Navarro, *supra* note 2.

5. *Id.*

6. For example, more frequent and longer service interruptions represent a deterioration in the quality of the electric power delivered to users.

7. Allocating fewer resources to the maintenance of capital assets subjects the assets to more rapid wear that reduces their useful life and, therefore, their market value.

8. National disruptions are possible because electric power companies effectively are tied into a national grid. Individual utilities typically buy and sell electric power depending

text, the introduction of retroactive ratemaking has disturbing overtones.

Over the last forty years, a number of state public service commissions have sought the authority to reduce retroactively the prices charged by the utilities they supervise.⁹ Retroactive rate reduction authority permits a commission to direct a utility to set aside a portion of its current revenue pending the outcome of a full rate investigation. If the investigation reveals that the rate of return actually earned by the utility exceeds the rate newly allowed by the commission, the commission can then establish a lower structure of tariffs and order the utility to refund all revenues attributable to the tariff differential that were collected since the beginning of the rate proceedings.

Until recently, commissions have failed to obtain the authority to change rates retroactively. The Supreme Court of the United States and various state high courts have ruled that the appropriate enabling statutes did not sanction retroactive rate reductions,¹⁰ and state legislatures have resisted pressures to amend the statutes. Recent events in Florida, however, suggest that the tide may be turning.¹¹

on, inter alia, daily and seasonal variations in demand and production. Local equipment failures could thus affect other companies tied into the grid, triggering equipment failures elsewhere.

9. *E.g.*, *Public Utils. Comm'n v. United Fuel Gas Co.*, 317 U.S. 456 (1943) (Ohio Public Utilities Commission attempted to fix retroactively the rates to be charged by an interstate company for natural gas sold in interstate commerce to a local utility); *Pacific Tel. & Tel. Co. v. Public Utils. Comm'n*, 62 Cal. 2d 634, 401 P.2d 353, 44 Cal. Rptr. 1 (1965) (California Public Utilities Commission attempted to roll back a utility's prior-approved general rates and to order a refund); *City of Miami v. Florida Pub. Serv. Comm'n*, 208 So. 2d 249 (Fla. 1968) (city unsuccessfully argued that commission had power to reduce rates retroactively); *Michigan Bell Tel. & Tel. Co. v. Michigan Pub. Serv. Comm'n*, 315 Mich. 533, 24 N.W.2d 200 (1946) (telephone company sought review of Public Service Commission's order to refund \$3,500,000 pro rata to subscribers to reduce 1944 gross revenues).

10. California, Florida, Michigan, and Ohio statutorily provided that the public service commissions set rates prospectively. See cases cited *supra* note 9; *accord* *Mountain States Tel. & Tel. Co. v. New Mexico State Corp. Comm'n*, 90 N.M. 325, 563 P.2d 588 (1977) (authority of utilities commission is solely legislative and necessarily prospective, not retroactive).

11. On October 6, 1978, the Florida Public Service Commission issued Order 8513 initiating a formal investigation of United Telephone Company's rates and charges. At the same time, Public Counsel filed a petition requesting that the Commission reduce United's prices so that the firm's rate of return did not exceed its allowed rate. In the oral presentation, Public Counsel urged that all of United's current income in excess of the amount permitted by the allowed rate be set aside and made subject to refund at the end of the investigation. Fla. Pub. Serv. Comm'n Investigation of United Tel. Co., Order 8513, No. 78077-TP.

On May 1, 1979, following hearings on the request, the Commission issued Interim Order 8855, which, claiming section 364.14 of the Florida Statutes as authority, directed

Retroactive ratemaking reduces the incentive of regulated utilities to operate efficiently. The economic analysis and the evidence presented here suggest that retroactive ratemaking produces the following results: higher production costs; less incentive to develop and adopt cost-reducing and product-improving innovations; less incentive to adopt more cost-related prices; and the transfer of some risk-bearing and monitoring functions from shareholders to consumers and commissioners. In the long run, consumers will pay higher prices for lower quality output. Inflation will exacerbate these consequences and threaten the ability of utilities not only to serve consumers but, indeed, to survive.

This paper examines the economic consequences of retroactive ratemaking and notes the evidence available, thus aiding legislatures and courts to reach more informed decisions. Section II contains a brief summary of the institutional setting and the theoretical framework. Section III discusses some of the more important economic consequences of retroactive ratemaking and compares them with the available evidence. Section IV contains a few concluding remarks.

II. ECONOMIC THEORY AND THE INSTITUTIONAL SETTING OF PUBLIC UTILITIES

A public utility is whatever the members of the appropriate legislature choose to define as such.¹² State legislatures typically

United to set aside \$3.3 million annually for possible refund pending the outcome of the full rate investigation.

On November 6, 1979, the Commission issued Interim Order 9133 requesting Southern Bell Telephone and Telegraph Company to set aside \$68.5 million annually pending completion of a full rate investigation.

On January 14, 1980, at the conclusion of United's proceedings, the Commission issued Final Order 9208, which required United to refund all receipts in excess of a newly established allowed rate of return of 9.62%. The refund was to be retroactive to May 1, 1979, the date Order 8855 was issued. United filed suit, Southern Bell subsequently joined, and the case went to the Supreme Court of Florida.

Before the court rendered its decision, however, the Florida Legislature amended the pertinent statutes and granted the Commission authority to set rates retroactively. See 1980 Fla. Laws ch. 80-36 (codified at FLA. STAT. § 364.055 (1981)). Thus, the legislature limited the Florida Supreme Court decision's impact and the case was settled out of court. Accordingly, it is not known whether judicial opinion had also shifted.

As late as 1978, in a ranking of bond ratings, Florida was one of only nine states considered to have a very "favorable" climate with respect to regulation by the public utility commission. See, e.g., Navarro, *supra* note 2, at 22.

12. Why and how certain firms should be regulated as public utilities continues to be debated. See, e.g., Demsetz, *On the Regulation of Industry: A Reply*, 79 J. POL. ECON. 356 (1971); Demsetz, *Why Regulate Utilities?* 11 J.L. & ECON. 55 (1968); Telser, *On the Regula-*

delegate the regulation of public utilities to independent commissions, and the enabling statutes are remarkably similar among states.¹³ Typically, a commission has the authority to control entry, to set the geographical boundary of a utility's monopoly, to specify the costs that the utility is allowed to take into account in determining its net revenue and rate base, to set the output prices that the utility may charge, and to establish the maximum rate of return that the utility can earn, i.e., the allowed rate.¹⁴

To enforce its policies, a commission can review a utility's accounting records and business practices. If the commission finds that the actual rate of return earned by a utility exceeds the allowed rate, it may initiate formal ratemaking proceedings. At the conclusion of these proceedings, the commission may increase the allowed rate of return or decrease the structure of prices, or both, with any changes applying prospectively. The utility may also apply to the commission for changes in its allowed rate and prices.¹⁵ Within these limits, managers of public utilities traditionally have been relatively free to maximize the wealth of the utility's owners—its shareholders.¹⁶

A commission ordinarily reviews a utility's costs and revenues only periodically. As a result, lags may occur during which the actual rate of return may exceed the allowed rate. The existence of this regulatory lag provides managers of public utilities with the incentive to reduce costs and increase revenues. Managers then are able to increase shareholders' wealth, concurrently serving consumers' long-term interests.¹⁷

Retroactive ratemaking reduces regulatory lag and, if fully and continuously enforced, could eliminate the lag entirely. With retro-

tion of Industry: A Note, 77 J. POL. ECON. 937 (1969).

In the past, normative prescriptions have not been the dominant factor in determining why and how certain firms were regulated as public utilities. See, e.g., Jarrell, *The Demand for State Regulation of the Electric Utility Industry*, 21 J.L. & ECON. 269 (1978); Peltzman, *Toward a More General Theory of Regulation*, 19 J.L. & ECON. 211 (1976); Stigler, *The Theory of Economic Regulation*, 2 BELL J. ECON. & MGMT. SCI. 3 (1971).

For a more detailed review and discussion of the issue raised in the text, see R. SCHMALENSSEE, *THE CONTROL OF NATURAL MONOPOLIES* (1979).

13. Most states have modeled their statutes after those enacted by New York and Wisconsin. See Jarrell, *supra* note 12, at 270-71.

14. E.g., FLA. STAT. ch. 366 (1981).

15. A utility may also request an interim rate increase (or decrease) subject to final approval following a full rate investigation. If a price increase is then found to have been excessive, the utility must refund the differential.

16. See, e.g., R. SCHMALENSSEE, *supra* note 12, at 40-42.

17. See, e.g., Baumol & Klevorick, *Input Choices and Rate of Return Regulation: An Overview of the Discussion*, 1 BELL J. ECON. & MGMT. SCI. 162, 182-89 (1970).

activity, the hypothesis that managers seek to maximize shareholders' wealth implies that managers will have more incentive to keep the actual rate of return from falling below the allowed rate. Managers no longer would have the incentive, however, to strive for a rate of return exceeding the allowed rate, because the differential would be taxed away retroactively through offsetting changes in output prices. Indeed, this retroactive tax weakens shareholders' rights, and implies that utility-maximizing managers will have greater opportunity to engage in cost-increasing and other activities designed to enhance their own wealth, ease their workloads, and otherwise promote their own welfare at the expense of consumers' and shareholders' interests.¹⁸

The authority to change rates retroactively also affects the incentive structure of utility-maximizing commissioners. Retroactive ratemaking transfers some of the risk-bearing and monitoring functions from shareholders to consumers and to the commission.¹⁹ Shareholders effectively become bondholders, although without a corresponding tax advantage to consumers.²⁰ Concurrently, commissioners would be induced to become more involved in the utility's day-to-day decisionmaking process, in the limit taking over the full range of traditional managerial functions. Such participation in management by commissions would have many of the attributes of government ownership of public utilities and would yield similar economic consequences.²¹

Much theoretical and empirical work has been undertaken concerning the behavior of utility-maximizing regulators and regulated utilities.²² Although much remains to be done, this research provides a framework for examining certain tentative implications

18. The seminal article on the application of the utility-maximization hypothesis to regulated firms is Alchian & Kessel, *Competition, Monopoly, and the Pursuit of Money*, in *ASPECTS OF LABOR ECONOMICS* 157 (1962). For a review of the subsequent literature, see generally R. SCHMALENSEE, *supra* note 12, and De Alessi, *The Economics of Property Rights: A Review of the Evidence*, 2 *RESEARCH L. ECON.* 1 (1980). Note that the allocation of resources, not merely the distribution of wealth, is at issue.

19. See *infra* text accompanying note 47.

20. To the extent that the rate of return to shareholders remains constant through the retroactive manipulation of prices to users, shareholders effectively become bondholders. For tax purposes, however, payments to shareholders are not considered a cost of doing business and thus are not deductible from gross receipts in computing a firm's taxable income. In contrast, payments to bondholders are tax deductible. Because retroactive ratemaking does not affect the taxation of payments to shareholders, the effective transformation of shareholders into bondholders does not yield a corresponding tax advantage to consumers.

21. See, e.g., De Alessi, *supra* note 1; Peltzman, *supra* note 12; Stigler, *supra* note 12.

22. See sources cited *supra* note 21.

of retroactive ratemaking.

III. CONSEQUENCES OF RETROACTIVE RATE REDUCTIONS

Retroactive rate reductions either decrease or eliminate regulatory lag, thereby lowering the effective rate of return that a utility is allowed to earn and thus imposing a more binding constraint on the firm's profits. The imposition of a more binding profit constraint, in turn, will result in higher production costs; inhibit technological innovations and product improvements; reduce the incentive to establish cost-related price structures; encourage utilities to seek more interim price changes; increase the cost of ratemaking proceedings; increase price uncertainty; deplete capital during inflationary periods; reduce investors' wealth; transfer risk-bearing from investors to consumers; and transfer the monitoring function from investors to the commission. These consequences of a more binding profit constraint are discussed below.

A. Increased Production Costs

A well-known implication of a binding profit constraint is that the managers of a wealth-maximizing firm will adopt more capital-intensive production techniques.²³ More precisely, if the allowed rate of return is equal to or greater than the opportunity cost of capital but less than the firm's unconstrained rate of return, then the wealth-maximizing ratio of capital to labor will be greater than the ratio which would have minimized production costs at the level of output chosen.²⁴ Substituting capital for labor and other resources increases the rate base²⁵ and, over some range, allows shareholders to capture returns that otherwise would be lost.

Setting the allowed rate of return closer to the cost of capital further encourages overcapitalization. Although the proposition may seem paradoxical, it has been derived rigorously²⁶ and is reasonable on closer reflection. Decreasing the gap between the allowed rate of return and the cost of capital expands the selection

23. For example, a firm may employ equipment that is either more automated or more durable, thereby substituting capital for labor and other inputs used in operating and maintaining the plant.

24. For a more rigorous statement and refinement of the analysis, see Baumol & Klevorick, *supra* note 17. Averch and Johnson developed the original analysis in their article in 52 AM. ECON. REV. 1052 (1962).

25. Some states measure the rate base or total invested capital as the original cost of the firm's assets less depreciation. See R. SCHMALENSSEE, *supra* note 12, at 28.

26. Baumol & Klevorick, *supra* note 17 at 174-76.

of higher cost input combinations that managers can employ to produce a given level of output. Accordingly, reducing this gap increases managers' opportunities to use more capital-intensive production techniques, resulting in greater deviations from the least-cost input combinations.

Lowering prices retroactively, thereby keeping the actual rate of return equal to or below the *nominal* allowed rate, lowers the *effective* allowed rate. Moreover, if the nominal allowed rate of return is also lowered retroactively, then the profit constraint becomes even more binding. Thus, retroactive ratemaking implies that managers of a wealth-maximizing firm will adopt a higher capital-labor ratio at the output level chosen, thereby incurring higher production costs.

The evidence relating to the overcapitalization hypothesis is mixed, although it does suggest that a binding profit constraint results in higher production costs.²⁷ One shortcoming of the test results is that they are based on data from the electric power industry where regulation has been relatively weak.²⁸ As the profit constraint becomes less binding, its effect on input proportions diminishes and it then becomes more difficult to detect in the presence of other phenomena.

A more fundamental problem with the overcapitalization hypothesis is that it rests on the premise that managers maximize shareholders' wealth. A binding profit constraint, however, weakens shareholders' property rights by reducing their opportunity to capture the benefits of monitoring managerial performance. Consequently, less monitoring is supplied, managers gain discretionary authority, and resources are used less efficiently.

27. Support for the overcapitalization hypothesis and for the related proposition that a binding profit constraint leads to higher production costs is provided by Courville, *Regulation and Efficiency in the Electric Utility Industry*, 5 BELL J. ECON. & MGMT. SCI. 53 (1974); Hayashi & Trapani, *Rate of Return Regulation and the Regulated Firm's Choice of Capital-Labor Ratio: Further Empirical Evidence on the Averch-Johnson Model*, 42 S. ECON. J. 384 (1976); Petersen, *An Empirical Test of Regulatory Effects*, 6 BELL J. ECON. 111 (1975); Spann, *Rate of Return Regulation and Efficiency in Production: An Empirical Test of the Averch-Johnson Thesis*, 5 BELL J. ECON. & MGMT. SCI. 38 (1974).

Other researchers failed to find any evidence of overcapitalization. See Baron & Taggart, *A Model of Regulation Under Uncertainty and a Test of Regulatory Bias*, 8 BELL J. ECON. 151 (1977); Boyes, *An Empirical Examination of the Averch-Johnson Effect*, 14 ECON. INQUIRY 25 (1976); Smithson, *The Degree of Regulation and the Monopoly Firm: Further Empirical Evidence*, 44 S. ECON. J. 568 (1978). Even within this group, however, Baron and Taggart found that regulated firms used inputs less efficiently, and Smithson concluded that the weight of the evidence still indicated that regulation resulted in higher production costs.

28. See, e.g., Jarrell, *supra* note 12; Stigler & Friedland, *supra* note 1.

The evidence generally supports the implications of the utility-maximization hypothesis.²⁹ Thus, for example, stricter controls, including those associated with outright government ownership, have been associated with more discrimination in hiring, greater variability in input proportions, longer managerial tenure, higher wage and salary expenditures, and higher operating costs.³⁰ Accordingly, it is not surprising that the overcapitalization hypothesis has received mixed empirical support.

On balance, the evidence reviewed indicates that a binding profit constraint results in higher production costs. More importantly, a binding profit constraint also increases managers' discretionary authority, leading to more discrimination in the hiring and use of resources, more managerial perquisites, and related consequences. Because retroactive ratemaking effectively makes the profit constraint more binding, it will intensify the magnitude of these effects.

B. *Less Technological Innovation and Product Improvement*

Regulatory lag provides the utility with a temporary opportunity to earn returns in excess of the allowed rate. According to the wealth-maximization hypothesis, managers will have the incentive to develop and adopt innovations that reduce costs and improve the quality of the product, increasing returns above the allowed rate during the regulatory lag period.³¹

To the extent that the profit constraint is binding, however, managers will have some opportunity for discretion. Accordingly, they will have less incentive to adopt cost-reducing and product-improving innovations, and they will give their preferences more weight in choosing the rate at which such innovations are adopted.³² It follows that retroactive ratemaking will result in a lower rate of technological innovation and product improvement as well as in greater variability in these rates among firms.

The evidence supports these implications. For example, electric utilities in states with stricter regulation incur smaller expenditures on research and development,³³ while regulated privately owned electric utilities adopt cost-reducing innovations more fre-

29. See De Alessi, *supra* note 18.

30. *Id.* at 27-42.

31. See Baumol & Klevorick, *supra* note 17.

32. See De Alessi, *supra* note 18.

33. See Sav, *R & D Decisions Under Alternative Regulatory Constraints*, 5 *ATL. ECON. J.* 73 (1977).

quently than do their municipally owned counterparts.³⁴ Moreover, municipally owned electric and water utilities provide less product variety to consumers.³⁵

C. *Reduced Incentive to Establish Cost-Related Price Structures*

Managers of a wealth-maximizing enterprise have the incentive to tailor the firm's tariff structure to the demands and costs of serving specific user groups. Accordingly, managers have the incentive to revise tariff structures periodically in response to constantly changing demand and supply conditions. Because retroactive rate reductions diminish a utility's opportunity to reap the benefits from these readjustments, the managers' incentive to establish and maintain cost-related tariff structures is reduced.

There is indirect evidence to support this implication, using government ownership as a proxy for stricter regulation of rates of return. Thus, the prices charged particular customer groups are more cost-related in the case of private than of municipal, electric utilities.³⁶ Moreover, the rates charged by privately owned electric utilities to different user groups reflect the same relationship to cost,³⁷ whereas the rates charged by municipally owned electric utilities are more cost-related for residential than for commercial and industrial users. Indeed, it is the commercial and industrial users who reap the main benefits from scale economies in the production of electric power.³⁸ Finally, regulated privately owned electric utilities use more tariffs designed to deal with the peak-load problem than do municipally owned electric utilities.³⁹

Taken together, these findings suggest that retroactive rate reductions will result in tariff structures that reflect less accurately the costs of serving individual user groups and that favor larger

34. See J. Tilton, *The Nature of Firm Ownership and the Adoption of Innovations in the Electric Power Industry* (1973) (unpublished manuscript).

35. Peltzman, *Pricing in Public and Private Enterprises: Electric Utilities in the United States*, 14 J.L. & ECON. 109 (1971); J. Hansman, *Urban Water Services Pricing: Public vs Private Firms* (Feb. 16, 1976) (unpublished Ph.D. dissertation, Dep't of Econ., George Washington Univ.).

36. Peltzman, *supra* note 35.

37. Jackson, *Regulation and Electric Utility Rate Levels*, 45 LAND ECON. 372 (1969); Mann & Mikesell, *Tax Payments and Electric Utility Prices*, 38 S. ECON. J. 69 (1971).

38. Mann & Seifried, *Pricing in the Case of Publicly-Owned Electric Utilities*, 12 Q. REV. ECON. BUS. 77 (1972).

39. De Alessi, *Ownership and Peak-Load Pricing in the Electric Power Industry*, 17 Q. REV. ECON. BUS. 7 (1977).

commercial and industrial users relative to domestic users.

D. *More Interim Price Changes*

Managers of regulated firms have the incentive to request a change in tariffs—whether up, down, or mixed—whenever the change is expected to yield increased profits. When deciding on the type and amount of tariff change to request, these managers must consider several variables, including the change in revenue attributable to the change in price and the resulting change in output; the change in production costs due to the change in output; the cost of presenting the utility's case before the commission to obtain the tariff change; the cost of implementing the new rates; and the time profile of the expected changes in the cost and revenue streams.

The magnitude of the changes in a utility's cost and revenue streams and the length of time that such changes will persist, however, are difficult to ascertain. The values of the underlying variables that determine a utility's cost and revenue functions vary continuously. Individual variations may be negligible or significant, additive or offsetting. More importantly for present purposes, such variations may be transitory or more lasting. Accordingly, managers of a regulated utility rationally will wait to apply for a change in tariffs until it is clear that the net effect of the underlying changes in circumstances is sufficiently large and enduring to justify the costs of a rate proceeding.⁴⁰ As a result, over some periods a utility's shareholders will accept a rate of return below the allowed rate.

A commission, on the other hand, does not bear the costs of a full rate proceeding in the same sense a utility does.⁴¹ Commissioners are not monitored by taxpayers and users as closely as utility managers are monitored by shareholders. Moreover, commissioners do not bear the wealth-consequences of their decisions as fully as the utility's shareholders. Hence, commissioners are more responsive to political pressures and to their own preferences. Having ac-

40. A similar analysis is applicable to those cases in which a commission permits a utility to implement an interim tariff change at the utility's own volition, subject to refund if, at the end of the full rate proceedings, the commission finds that the change was unjustified.

41. Members of a commission and their staff presumably would be at odds on the issue. For example, the salaries of commissioners typically are fixed by the legislature, whereas the salaries of the commission's staff typically increase with increases in the workload and the number of employees supervised. See De Alessi, *supra* note 1. As a result, members of the staff would reap more benefits than commissioners from increased regulatory activity and thus would seek to initiate more activity.

quired the authority to impose interim rate reductions, commissioners may be expected to use it, at least in some cases in which the underlying economic changes are transitory or small. Given pressure from consumerists and other public interest groups, commissioners will be inclined to review more frequently the actual rates of return, and to revise tariff structures accordingly, in order to inhibit the realized rate from exceeding the allowed rate.⁴²

Interestingly, if the commission reviews rates more frequently, the managers of the utility will then have more incentive to ensure that the realized rate of return does not fall below the allowed rate. Thus, these managers will be more likely to request interim rate increases in response to even transitory changes in conditions. This follows because the cost to the utility's shareholders of the additional ratemaking proceedings would now be paid out of profits that, if not expended for this purpose, would be refunded to customers and lost forever. The result would be an escalation in both commission and utility-initiated rate proceedings, with correspondingly increased costs to customers and taxpayers.

E. *Higher Cost of Ratemaking Proceedings*

The authority to reduce rates retroactively will result in an increase in the resources allocated to ratemaking. First, ratemaking proceedings will occur more frequently or, in the most extreme case, continuously. Consequently, both the commission and the utilities will incur increased ratemaking costs. Second, the funds set aside pending the outcome of the ratemaking proceedings will necessarily earn a lower rate of return than if they had been used by the utility. This result follows because placing the funds aside represents an additional constraint on the utility. The foregone return from these funds is an additional cost of operation. Third, making refunds is costly. Thus, the utility must identify the recipients, compute the individual amounts due, and issue checks or enter credits.

F. *Increased Uncertainty*

Retroactive ratemaking also results in increased uncertainty during periods of rapid changes in the general level of prices. Although the presumed object of regulation is to control the eco-

42. For a more detailed discussion on the incentives of commissioners, see De Alessi, *supra* note 1 at 2-4.

conomic rate of return, proceedings typically rely on accounting data that seldom reflect accurately the underlying economic variables. Changes in the general level of prices introduce additional divergences between accounting data and economic values. Retroactive ratemaking, by increasing the frequency of adjustments when the meaning of the underlying data is difficult to determine, creates additional uncertainty regarding the outcome of the regulatory process. And more uncertainty means higher costs.

G. *Depletion of Capital During Inflationary Periods*

Accounting records typically reflect historical costs. As a result, during periods of inflation, accounting data systematically understate the value of capital assets acquired in preceding years. Because the rate base is obtained from these accounting records, it is understated. Note that the higher the rate of inflation, and the longer it has persisted, the greater is the understatement.

What may be less obvious is that historical accounting methods also understate true production costs, which include the opportunity cost of the flow of services provided by the utility's assets. If the value of the assets is understated, then the value of the services they provide presumably is understated as well. As a result, both the accounting profits and the accounting rate of return are greater than their economic counterparts. Moreover, to the extent that the rate of inflation is anticipated, the market rate of interest will rise to reflect the higher cost of using resources earlier in time. The higher interest rates represent an additional cost of doing business.⁴³

These considerations are particularly significant in the case of public utilities, firms that typically use highly capital-intensive production techniques. Thus, if the rate of return allowed by the commission is tied to a rate base that understates the current value of assets, then the utility's real earnings will be below the rate justified by economic circumstances and will be insufficient to compensate investors, maintain the capital stock, and attract new funds for system expansion. The irony of all this, at least in the case of electric utilities, is that consumerist policies result in higher prices to consumers and lower reliability of the system.⁴⁴

43. For a recent discussion on the limitations of accounting data, see Fisher & McGowan, *On the Misuse of Accounting Rates of Return to Infer Monopoly Profits*, 73 *AM. ECON. REV.* 82 (1983).

44. See Navarro, *supra* note 11.

If retroactive ratemaking is used during inflationary periods to keep the accounting rate of return equal to or less than some allowed rate that is too low by current economic conditions, then it will exacerbate the economic consequences discussed above. In particular, a utility will be able to survive only by allowing services to deteriorate and using up its capital stock. The longer the process continues, the greater will be the deterioration and the greater will be the threat to the actual survival of the firm.

H. *Reduction of Investors' Wealth*

Retroactive rate reductions effectively lower the utility's realized rate of return, thereby reducing the net stream of income available for distributions to shareholders. Shareholders of record when the initial notice of retroactive rate reduction is given suffer a capital loss. This loss is equal to the present value of the expected decrease in the utility's net revenue, and is due to this first reduction *and* to all expected future retroactive rate reductions. The loss occurs because an investor's stock certificate represents the right to a fraction of the firm's net stream of income. When that net stream is reduced, provided the opportunity cost of capital remains unchanged, its present value falls and the price of the share is correspondingly reduced. Thereafter, share prices increase or decrease, and investors gain or lose, depending upon how the market-weighted, initial anticipations regarding the consequences of the retroactive rate reductions are revised on the basis of subsequent information.

The evidence indicates that stricter regulation reduces investors' wealth.⁴⁵ For example, the accounting rate of return earned by electric utilities in states that use original-cost valuation in computing the rate base typically is lower than the rate of return earned by firms in states that use less strict, fair-value standards.⁴⁶

I. *Transfer of the Risk-Bearing Function from Investors to Consumers*

Perhaps the most important consequences of retroactive

45. See, e.g., Pike, *Residential Electric Rates and Regulation*, 7 Q. REV. ECON. & BUS., Summer 1967, at 45; Primeaux, *Rate Base Methods and Realized Rates of Return: Reply*, 17 ECON. INQUIRY 300 (1979); Primeaux, *Rate Base Methods and Realized Rates of Return*, 16 ECON. INQUIRY 95 (1978); Rock, *Rate Base Methods and Realized Rate of Return: Comment*, 17 ECON. INQUIRY 297 (1979).

46. See sources cited *supra* note 45.

ratemaking relate to the risk-bearing and monitoring functions. Recent theoretical advances suggest that the firm may best be viewed as a set of contractual arrangements among owners of jointly used, cooperating resources.⁴⁷ Firms are organized to lower the cost of monitoring the exchange and utilization of these resources. The shareholders, who are the residual claimants, are the owners of those assets that are specialized to the firm. Thus, shareholders bear the risk of changes in the market value of the firm. The more shares they own, the greater the proportion of any gains they will reap from monitoring. As a result, shareholders, by assuming the risk of fluctuations in the firm's earnings, have a greater incentive to monitor the firm's performance than do the owners of other resources used in the firm's operations.

Under retroactive ratemaking, commissioners have the opportunity to vary a utility's prices instantaneously and continuously to keep the realized rate of return from exceeding the allowed rate. Managers of public utilities, on the other hand, have the incentive to file for interim rate increases to prevent the realized rate of return from falling below the allowed rate. Thus, under reasonable conditions, the rate of return earned by shareholders will be equal to the allowed rate and relatively stable. If the utility is operating at a loss, however, shareholders will be the first to bear the brunt. For all practical purposes, shareholders will become just another, riskier class of bondholders. The prices paid by consumers, on the other hand, will vary continuously as the commission imposes price reductions retroactively and the utility adopts interim price increases more frequently, with a greater proportion of these price increases in time proving unjustified and requiring refunds. Effective prices, that is, nominal prices minus potential refunds, will fluctuate continuously in response to changing expectations regarding the likelihood and amount of any ultimate refund.

The risk associated with changes in the utility's earnings, ordinarily borne voluntarily by investors—who are specialists in risk-bearing—will shift to consumers who have no obvious advantage in dealing with it. To the extent that shareholders have a compara-

47. Klein, Crawford & Alchian, *Vertical Integration, Appropriable Rents and the Competitive Contracting Process*, 21 J.L. & ECON. 297 (1978); see also Alchian & Demsetz, *Production, Information Costs, and Economic Organization*, 62 AM. ECON. REV. 777 (1972); Fama, *Agency Problems and the Theory of the Firm*, 88 J. POL. ECON. 288 (1980); Jensen & Meckling, *Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure*, 3 J. FIN. ECON. 305 (1976); Williamson, *Transaction-Cost Economics: The Governance of Contractual Relations*, 22 J.L. & ECON. 233 (1979).

tive advantage in bearing risk, shifting the risk to consumers implies that the cost of risk-bearing will increase. Closer involvement by the commission in the utility's day-to-day operations will increase the probability of decisions which, from a profit-maximization perspective, appear to be erratic, causing a further rise in the cost of risk-bearing. Thus, retroactive ratemaking's effect on the cost of risk-bearing will result in higher prices to consumers.

This analysis suggests that utilities will find it costlier to float new stock issues and will be induced to shift toward more bond financing. A reduced equity, however, implies higher risk for bondholders, and utilities will thus have to pay higher interest rates.

Published evidence supports these implications.⁴⁸ Bonds issued by utilities located in states with less favorable regulatory climates typically receive lower ratings and yield higher interest rates. Moreover, the ratio of the market price of a utility's common stock to its book value is significantly lower in states with less favorable regulatory climates, reflecting an increase in the cost of equity capital. Indeed, a shift in regulatory climate from very favorable to unfavorable seems to entail an increase of approximately two percentage points in the cost of both equity and debt capital.

J. *Transfer of the Monitoring Function from Investors to the Commission*

As noted in the last section, retroactive ratemaking effectively converts shareholders into bondholders. Because the rate of return they earn is fixed by the commission and is relatively stable, investors are unable to capture the gains from improved operations. Thus, these investors have little incentive to monitor management.

Individual consumers bear the consequences, through continuous variations in price, of unanticipated changes in the utility's value. Individual consumers, however, are able to capture only a negligible portion of any gains from improved operations. Unlike shareholders, consumers have no voting rights and their stake in the utility's success cannot be capitalized and transferred to others. Accordingly, consumers have virtually no incentive to monitor.

48. See Archer, *The Regulatory Effects on Cost of Capital in Electric Utilities*, 107 PUB. UTIL. FORT., Feb. 26, 1981, at 36; Trout, *The Regulatory Factor and Electric Utility Common Stocks Investment Values*, 104 PUB. UTIL. FORT., Nov. 22, 1979, at 28. For a more detailed summary of this and related evidence, see Navarro, *supra* note 2.

Regulatory commissions are already involved in monitoring the firm's records and price decisions. As a utility's financial position deteriorates, the commission will have the incentive to monitor more closely the managers' operating decisions in order to inhibit inefficiency. Indeed, regulators would become progressively more involved in the utility's day-to-day decisionmaking process, thereby effectively taking over many traditional managerial functions. In extreme cases, a commission would simply find itself managing the utility. For all practical purposes, the utility would have been nationalized, i.e., converted to public ownership. Finally, commissioners also are unable to capture the full gains from any improvement in the operation of the firm. Accordingly, they too would have limited incentive to monitor effectively.

IV. CONCLUSION

The analysis presented in this paper suggests that the apparent benefits to consumers of permitting public service commissions to implement retroactive rate reductions are deceptive. Retroactive refunds clearly result in lower prices to users during the initial period covered. Higher prices and lower-quality output in subsequent periods, however, will more than offset this initial reduction.

In particular, theory and evidence suggest that retroactive ratemaking results in higher production costs and more variance in input combinations; less incentive to develop and adopt cost-reducing production techniques, to develop and introduce quality changes desired by consumers, and to adopt cost-related prices; more requests for interim price increases from utilities; higher ratemaking costs; lower shareholders' wealth; and the transfer of at least some of the risk-bearing and monitoring functions from shareholders to the commission and to consumers.

In the long run, retroactive rate reduction will result in higher prices to consumers, lower quality of output, and lower returns to investors. Inefficient production associated with the partial nationalization of the firms will consume resources that otherwise could have been used to benefit both consumers and producers.

Periods of inflation, myopic consumerist pressures, and swings in national policies, e.g., towards the environment, all contribute to uncertainty and exacerbate the debilitating effects of retroactive ratemaking. In this context, more informed legislative and judicial decisions will be crucial in maintaining the ability of public utilities to serve consumers and to survive.