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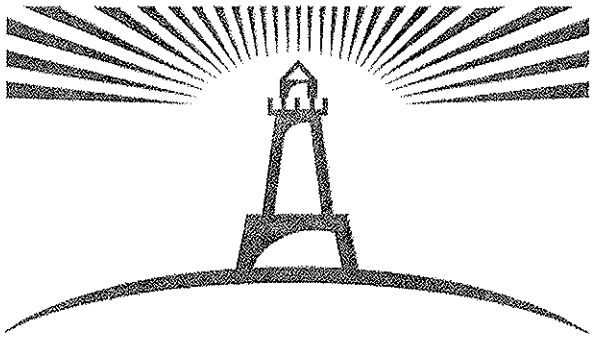

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How Performance Measures Can Improve Regulation

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Online Access

The reader can find this paper on the Web at http://www.nrri.org/pubs/multiutility/NRRI_utility_performance_measures_jun10-09.pdf.

Executive Summary

Regulation's central purpose is to induce high-quality performance from our utilities. To achieve that objective, regulators must measure and evaluate utility actions.

Performance depends on how well management uses the available resources. Also affecting performance are factors outside management's control.

Uses of Performance Measures

The challenge for regulators is to determine what constitutes a well-performing utility. What do they consider acceptable performance? These are questions that regulators need to address if they are to exploit fully the information contained in performance measures for regulatory actions such as prudence determination and rate setting. The measurement of performance trends in the absence of a standard, for example, might limit regulatory action to further review, not to a determination of cost recovery.

The National Regulatory Research Institute (NRRI) is writing a series of papers on performance. This particular paper helps regulators to form a context, rationale, and a general framework for initiating a strategy to measure and evaluate the performance of utilities in their states. It begins with a discussion on major questions that regulators should address before applying performance measures. The paper also provides guidance to regulators on how to better gauge utility performance in non-cost functional areas such as reliability and other dimensions of service quality. Such evaluation allows regulators to satisfy the objective of consumer protection.

This paper provides regulators with the following information:

1. The rationale for why regulators should measure and evaluate utility performance;
2. Guidance on how regulators can best apply performance measures in various areas of utility operations;
3. General interpretations of utility performance and alternative regulatory responses;
4. Different performance measures that regulators can use;
5. The uses and limitations of different performance measures and performance-measurement techniques;
6. The different regulatory venues for the application of performance measures, both within and outside a rate case; and

7. A general framework and sequence of steps that regulators can take to initiate performance measurement and evaluation tasks.

An Illustration of a Regulatory-Review Process

Figure ES-1 illustrates one way in which regulators can review a utility's performance and take appropriate action. The diagram shows four major things:

1. ***Regulation itself affects utility management behavior.*** Together with factors that fall outside the control of a utility, management behavior determines a utility's performance. Regulatory rules, policies and practices directly and indirectly affect utility performance. Utility performance, in turn, can influence regulatory actions. Poor utility performance, for example, might induce regulators to provide utilities with stronger incentives and disincentives or to establish standards for future performance.

2. ***Regulators should initially assess the utility's performance by comparing actual performance with a pre-specified standard.*** Any substantial deviation can reflect exceptionally good or bad performance. The utility would then have the opportunity to respond to the evidence of bad performance, with subsequent evaluation by the regulator.

3. ***Based on its review, the regulator can then take a particular action.*** The action may affect cost recovery by the utility, lead to a more detailed investigation such as a retrospective management audit or induce the regulator to institute a mechanism that would reward or penalize the utility for exceptional performance. The regulator can take other actions or no action in response to its assessment. One such action might include rewarding the utility for above-average performance that the regulator judged to reflect exceptional management behavior.

4. ***Performance measures can help regulators determine "just and reasonable rates."*** The objective of the proposed regulatory approach is to enhance the ability of state commissions to make informed decisions. Accountability requires regulatory assurance that utility costs incorporated in rates reflect prudent, efficient, effective and customer-responsive management behavior. Accountability also demands that regulators recognize the financial interests of utilities; namely, to permit prudent and efficient utilities a reasonable opportunity to earn a fair rate of return and attract capital to serve the long-term interest of their customers. Performance measures can provide regulators with a tool to achieve these outcomes.

Organization of the Paper

This paper contains six parts. Part I defines "performance." Part II gives reasons for why regulators should measure utility performance. Part III identifies the challenges that regulators face in interpreting performance measures for various applications. In Part IV, the paper provides an overview of the different techniques for performance measurement. Part V discusses specific applications of performance measurement in different regulatory venues, including rate cases, the development of incentive mechanisms and periodic oversight. The final part lists six steps for executing a regulatory "performance" initiative.

Appendix A: Price Differentials across Utilities: The Challenge of Detecting Causes

Theoretical problem

Assume that regulators want to compare the prices charges by different utilities. They can use this information in various ways. First, they can see how the prices of utilities in their state rank with those in other states. Second, they might conduct a statistical analysis to identify reasons for price differences. They might, for example, want to know whether demand conditions and other factors beyond the control of a utility explain most of the differences. This analysis would require specifying and estimating a conceptual model such as:

$$P_{ci} = f(D_{ci}, C_{ci}, R \ldots Z),$$

where the price charged by utility i to customer class c relates to demand conditions (D_{ci}), costs (C_{ci}), regulatory practices (R), and other factors (Z). By estimating the relationships between price and the individual factors, regulators can assess the effect of each factor on price. They can then use this information to better understand why prices vary across utilities. Regulators can then interpret price differences that are unexplained by these factors as a residual. The residual can reflect model error in predicting price or variations in management competence, or a combination of both.

Some regulators might attempt to use price as a benchmark to penalize or reward a utility. Price is easy to measure and it compasses all of a utility's costs, avoiding the distortive incentives that could arise from using a partial measure of performance. But the problems associated with a "price" benchmark are potentially serious. Utilities might have different prices at a point in time because of the uneven treatment of certain costs (e.g., some states may allow construction work in progress in rate base while other states do not). One utility also could have higher growth in output, which because of economies of scale would cause its average costs to decrease relative to other utilities. Each of these factors could cause one utility to rank lower than other utilities even though management behavior was no factor.

An illustration: identifying price factors for a natural gas utility

One or more of the following general factors can explain the large differences in retail gas prices between natural gas utilities, both within a state and across states: (1) customer-demand characteristics (e.g., load factor, gas usage per customer, use of gas for space heating), (2) cost and supply conditions (e.g., proximity to gas fields, the number of pipelines serving the utility), and (3) management practices (e.g., hedging strategies, proficiency in cost control). A major component of gas prices to small retail customers is gas commodity costs. These costs, when added to pipeline costs and distribution margins, comprise the retail price charged to small customers. Thus, in examining price differences across utilities, an analysis should first disaggregate the differences by individual functions. For example, to what extent do higher-

priced gas utilities have higher pipeline rates, distribution margins, and commodity gas costs?

One can imagine several factors accounting for price differentials across gas utilities. They include:

1. *Levels of storage available to each gas utility*: Those utilities without storage capability would tend to have higher costs, assuming other things held constant. Some gas utilities tend to have higher rates partially because of their lower storage capability relative to other gas utilities.

2. *Rate legacy*: Cost allocation methods and the ratios of rates to different customer classes may vary across utilities. For various reasons, the residential rates of some gas utilities may reflect cost-of-service principles less than those of other gas utilities. Also, different accounting treatment of storage costs and other cost components can affect rates.

3. *Cycling issue with purchased gas adjustment (PGA) clauses*: The adjustment period might not be uniform across utilities; adjustments, for example, might be monthly, quarterly, or annually, depending upon the gas utility. The periods for which a utility adjusts its purchased gas costs can, therefore, distort a snapshot comparison of prices across utilities.

4. *Gas procurement and hedging practices*: Transaction arrangements and hedging activities are important factors in affecting purchased gas costs. Viewed from across the country and within individual states, one observes a wide discrepancy in physical and financial hedging by utilities. This discrepancy means that when wholesale gas prices change, up or down, there would be a lesser rate effect on those utilities that have hedged more. Differences in management philosophy may explain why some gas utilities hedge more or less than other utilities.

5. *Distribution margins (i.e., the portion of retail rates left over after subtracting gas commodity and pipeline costs)*: Large differences exist across utilities; a major factor is the sales volumes or throughput per customer. Distribution margins are generally higher for rural utilities, for utilities in warmer climates, and for those utilities with recent capital expenditures recovered in rates. Prices in warm-weather states are generally higher because utilities have to recover their fixed costs over fewer sales, which drives up their average cost and prices.

6. *Pipeline rates:* Factors include the zonal area of a pipeline, as the Federal Energy Regulatory Commission (FERC) allows price differences between designated zones. The number of pipelines that move gas to a specific utility may affect rates (i.e., competitive conditions would tend to place a downward pressure on rates). The load factor of firm customers may also be important—for example, utilities with lower load factors would tend to have higher pipeline rates because of FERC's straight-fixed rate design.

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7. *Different services offered under the base rate*: Some utilities may still provide maintenance and other services under base rates.

8. *Economies of scale*: Larger gas utilities may have lower average cost because of the economies from procuring gas and pipeline transportation at greater amounts.

9. *Economies of scope*: Some utilities like combination electric and gas utilities may perform more functions that offer synergies with other functions, which would lower costs.

One consulting firm, Pacific Economics Group (PEG), has conducted several studies that apply an econometric statistical cost model to explain differences in non-fuel O&M costs and other costs across energy utilities.[29] These studies show that the services provided, the scale of operations, the prices of inputs, and other business conditions explain some of the cost differences across utilities. Their studies have found, for example, that greater use of cast iron increases both maintenance and replacement costs. PEG also found that scope economies lower costs. They distinguish between the effects on cost from increased throughput per existing customer and from the addition of new customers. (The latter has a greater effect.) They also found that natural gas utilities serving urban areas have higher costs partially because of the greater difficulty of installing mains and service lines.

[29] *See*, for example, Pacific Economics Group, *The Cost Performance of Boston Gas*, January 28, 2003; Pacific Economics Group Research, *Benchmarking the Operating Performance of Portland General Electric*, February 10, 2010; and Mark Newton Lowry et al., "Econometric Benchmarking of Cost Performance: The Case of U.S. Power Distributors," *The Energy Journal* 26, 3 (2005): 75-92.