



National Regulatory  
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# **How Performance Measures Can Improve Regulation**

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## **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.

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 National Regulatory Research Institute (NRRI) is writing a series of papers on performance. This presentation draws on one of these papers, which 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.

## **I. Introduction**

### **A. An important function of regulation is to measure and evaluate the performance of public utilities.**

1. Effective regulation requires it if utilities are to be held accountable for their performance.
2. After all, if regulators hope to set regulatory standards, determine “just and reasonable” rates or take other actions integral to their duties, they need to measure utility performance and acquire other information to evaluate utility performance.

### **B. U.S. regulators have under-exploited the benefits of performance measures.**

1. Performance measures have several applications that regulators need to consider.
2. Regulators have made little use of performance measures for benchmarking (i.e., comparing one utility’s performance with a selected peer group).

### **C. Regulators should have great interest in measuring utility performance.**

1. Measurement can lead to better regulatory incentives and improved utility performance. Improved performance, in turn, can lead to lower rates over time, higher quality of service, fewer rate cases, and consumer protection against excessive utility costs.
2. Performance measurement can detect subpar utility performance that could lead to further investigation, cost disallowances or a change in regulatory incentives.
3. It can also help regulators determine whether utilities are satisfying stated objectives or targets.
4. Performance measurement can also help regulators reward utilities for superior performance that benefits customers via lower rates or higher service quality.

## **II. What Do We Mean by Performance?**

### **A. I define performance as the outcome of a single action.**

1. Performance depends on two broad factors:
  - a. Management behavior, and

- b. Market and business conditions, and other factors beyond the control of a utility
2. These actions affect the various dimensions of a utility's operations and services, including cost performance, reliability, and service quality, all of which affect consumer welfare.
3. Performance is the "proof of the pudding," determining how a utility's actions affect its customers and the public.

**B. A tradeoff often exists between simplifying the measurement of performance and applying the measures in more regulatory decisions.**

1. As an example, measuring the ability of utility management to control a specific cost item or total costs, to be used in rate setting or a prudence review, requires accounting for factors that lie beyond management's influence.
2. Absent this consideration, any performance measure would have limited value for directly assessing utility-management behavior (i.e., the ability and effort of management to improve the utility's performance).
3. When made across a sample of utilities, performance measures can provide a "red flag" that could trigger further regulatory review. The review could identify the reasons why a particular group of utilities have higher costs than other utilities or why their customer service is below average.

### **III. Why Should Regulators Measure Utility Performance?**

**A. Performance problems under regulation**

1. The economics literature shows that public utilities left unregulated, or ineffectively regulated, would perform in a socially nonoptimal way. They would:
  - a. Set prices too high,
  - b. Excessively price discriminate,
  - c. Provide an inferior quality of service,
  - d. Deploy a nonoptimal mix of inputs, and
  - e. Expend too little effort to control costs and innovate.

2. Studies on regulation have documented each of these effects, which depend on extant regulatory incentives and rules that govern utility behavior.
  - a. Economic theory – whether neoclassical or X-efficiency theory – predicts that regulated utilities subject to rate-of-return (ROR) regulation would perform at less than the highest possible allocative or productive efficiency.
  - b. Traditional regulation tends to give utilities weak incentives to minimize their costs, which has probably become truer in recent years because of cost trackers and formula rates.
  - c. As long as a utility is able to pass on to customers additional costs and also pass on any cost savings it achieves, it has little economic incentive to perform efficiently.

**B. Regulators have an information disadvantage**

1. In traditional regulation, the regulator is at a disadvantage relative to the utility in interpreting the utility's performance.
  - a. Do the actual costs reflect competent utility management, or
  - b. Do they include wasteful costs that the utility could have avoided?
2. The utility generally would defend these costs as its best effort under the circumstances.
  - a. In promoting their self-interest, many utilities would be inclined to provide incorrect or misleading information about their managerial efforts and cost opportunities.
  - b. Performance measures and their application by regulators can help lessen the information asymmetry they inherently face in their oversight of utilities.
3. If regulators had good information about how utilities should perform, they could readily set performance standards that the utility would have to meet or suffer the consequences.
4. The regulator faces the problem of less-than-perfect information about the efforts of utility management and the utility's cost opportunities.
5. The regulator observes outcome (e.g., power plant reliability) but does not know how to assess management's role in the outcome.

- a. Regulators lack the required information to identify optimal performance.
- b. They have to resort, therefore, to alternative actions, such as special incentives or judgment of a utility's performance based on the information provided to them by the utility and other sources.

#### **IV. The Challenge Facing Regulators in Measuring and Evaluating Utility Performance**

##### **A. Three general factors affect utility performance:**

1. The resources used,
2. Management behavior, which determine what resources a utility should use and how it should combine them to produce some "output," and
3. Market and business conditions over which the utility has little control

##### **B. Sports metaphors**

1. Golfers
2. Baseball managers

##### **C. Regulatory considerations for applying performance measures**

1. The first decision is to select the functional areas for measuring utility performance. What are the criteria for selection?
  - a. The effect of a functional area on a utility's total cost or on consumer value from reliable and high-quality utility service,
  - b. The ease of measurement,
  - c. The effort required to interpret a performance measure, and
  - d. The influence of utility management in affecting performance
2. Improved performance in one area can reduce performance in another (e.g., cost and service quality, TFP and power plant performance).
3. Performance depends upon different factors, some under a utility's control, others exogenous to a utility (e.g., the retail price).
4. Performance measures are either estimates or actual accounting numbers (e.g., power plant reliability, total factor productivity).

5. Varying degrees of difficulties exist in measuring performance (e.g., accounting ratios and econometric methods).
6. Regulators can use either *ex post* or *ex ante* measures of performance, or both in a particular application (e.g., standards and actual performance for service quality)
7. Tradeoffs can exist between short-term and long-term performance (e.g., tree trimming, capital expenditures in general).
8. Benchmarking can use as a reference:
  - a. “Average” performance,
  - b. “Exceptional” performance, or
  - c. “Standard” performance as determined by the regulator (e.g., the top quartile of utilities in customer service)

## **V. General Interpretations of Utility Performance and Implications for Regulatory Action**

- A. The utility is performing prudently.**
- B. The utility is performing prudently but its performance can improve.**
- C. The utility is performing worse than peer utilities.**
- D. The utility is performing better than peer utilities.**
- E. The utility is performing unsatisfactorily.**

## **VI. An Overview of Different Techniques for Measuring Performance**

- A. Attributes of good performance measures**
  1. Performance measures should be objective, quantifiable and verifiable. One interpretation of these qualities is that good measures represent metrics derived from public data and sound analytical techniques that anyone can replicate
  2. When establishing benchmarks, regulators should use performance measures that, as much as possible, reflect utility-management behavior.
    - a. One benchmark for regulators to consider is the performance of an “average utility.”

- b. When performance measures do not separate management behavior from other factors:
          - (1) A utility could profit or assume a top ranking even if only because of favorable conditions under which it operates, or
          - (2) It could be penalized for prudent and efficient behavior.
- B. Econometric methods, indexing and data envelopment analysis (*See* NRRI Report 10-05)**
- C. Additional ways to measure utility performance**
  - 1. Management audits
  - 2. Accounting ratios for individual functional areas (e.g., O&M expense per customer)
- D. Uses and limitations of performance measurement (*See* table at the end of this presentation)**

## **VII. Applications of Performance Measures in Different Regulatory Venues**

- A. Three general applications of performance measures**
  - 1. Evaluate the information used by a utility prior to an action (e.g., a utility proposing to improve its service quality)
  - 2. Observe and evaluate the utility's actual performance (e.g., relative to a target previously established by the regulator)
  - 3. Retrospectively review the prudence of the utility in undertaking the action
- B. Specific applications**
  - 1. *Regulatory incentive mechanisms*
    - a. Performance benchmark
    - b. Actual performance
  - 2. *Periodic monitoring of utility performance outside a rate case*
    - a. Performance for individual functional areas
    - b. Utility-wide performance

3. *Comparison of a utility's actual performance with a benchmark, both in rate cases and other regulatory forums*
  - a. Need to establish a benchmark
  - b. Different functions for benchmarking (e.g., monitor relative performance across utilities, establish targets or standards for utility performance, mitigate the cost-plus nature of regulation)
4. *Evaluation of the reasonableness of "cost-of-service" components, adjustment of the rate of return on equity (ROE), and use of total factor productivity*
  - a. Rate-of-return regulation
  - b. Price-and-revenue cap regulation
5. *Preliminary review of a utility's performance to determine further action*
6. *Examination of the reasons for performance differences across utilities*
7. *Publicity of a utility's performance on a periodic basis*

### **VIII. A Six-Step Approach for a "Performance" Initiative**

- A. Identify uses of performances measures**
- B. Select utility functional areas for regulatory review**
- C. Calculate the performance measures**
- D. Compare a utility's performance with a predetermined benchmark**
- E. Assess a utility's performance**
- F. Take action**

**Table: The Uses and Limitation of Different Performance Measures and Measurement Techniques**

<b>Performance measurement</b>	<b>Use</b>	<b>Limitation</b>
<b>Statistical method</b>	<ul style="list-style-type: none"> <li>• Estimation of average performance as the predicted cost controlling for a utility's exogenous conditions</li> <li>• Ranking of the performances of different utilities based on the deviation between a utility's actual performance and average performance</li> <li>• Estimation of the effect of individual factors on cost</li> <li>• Application of statistical tests for performance evaluation</li> </ul>	<ul style="list-style-type: none"> <li>• Predictions of average performance sensitive to different assumptions, model design, the data, and econometric errors</li> <li>• Requirement of substantial data</li> <li>• Demand for skills in sophisticated econometric and statistical techniques</li> <li>• Inclusion of only quantifiable factors</li> </ul>
<b>Accounting cost and non-cost ratios</b>	<ul style="list-style-type: none"> <li>• Provision of information that "red flags" or identifies potential problem areas at low cost</li> <li>• Provision of preliminary information for in-depth inquiry</li> <li>• Comparison of a utility's performance over time or with other utilities</li> </ul>	<ul style="list-style-type: none"> <li>• No separation of management effects and other factors on performance</li> <li>• Narrow-based measures that don't account for interdependencies between utility functions</li> <li>• No definite benchmark</li> </ul>
<b>Management audits</b>	<ul style="list-style-type: none"> <li>• Evaluation of current processes, policies and management practices for specific functional areas</li> <li>• Recommendation on improvements or prudence of past actions</li> <li>• Establishment of "process" standards for future performance</li> </ul>	<ul style="list-style-type: none"> <li>• Expensive to conduct</li> <li>• No "outcome" metric or benchmark</li> </ul>
<b>Total factor productivity</b>	<ul style="list-style-type: none"> <li>• Quantification of the overall cost performance of a utility</li> <li>• Quantification of the effects of individual factors on performance</li> <li>• Comparison of a utility's performance over time or with other utilities</li> </ul>	<ul style="list-style-type: none"> <li>• Estimation of some required data</li> <li>• No separation of management effects and other factors on performance</li> <li>• No definite benchmark</li> </ul>
<b>Price</b>	<ul style="list-style-type: none"> <li>• Comparison of a utility's average cost with other utilities</li> </ul>	<ul style="list-style-type: none"> <li>• No separation of management effects and other factors on performance</li> <li>• No explicit benchmark</li> </ul>