

Incentive Regulation: Introduction and Context

Presented at

AUC PBR Workshop

Johannes Pfeifenberger

www.brattle.com

Edmonton, Alberta

May 26–27, 2010

Objectives of Utility Regulation

Regulators may strive to achieve all of the following:

- ◆ “Just and reasonable” rates
 - allow utility to recover (prudent) costs and fair rate of return
 - ensure customers are not over-charged
- ◆ Economically efficient rate structure
- ◆ Cost efficient utility operations
- ◆ Sufficient infrastructure investment
- ◆ Reliability and service quality
- ◆ Reasonable administrative cost of regulation
- ◆ Special policy objectives (e.g., renewables, smart grid, demand-side efficiency, emission reductions, etc.)

Inevitable trade-offs and compromises are necessary

What is Incentive Regulation?

Incentive regulation or performance-based regulation (PBR) in the academic literature:

- ◆ Regulatory mechanisms that provide utilities with incentives to increase their productive (cost) and allocative (pricing) efficiency (various sources)
- ◆ “Implementation of rules that encourage a regulated firm to achieve desired goals by granting some (but not complete) discretion to the firm” (Sappington and Weisman, 1996)
 - Increased discretion allows firm to use (or acquire) superior knowledge about how to achieve desired goals, particularly in a rapidly changing industry
- ◆ “The contrast between [cost-of-service regulation and PBR] is mostly one of emphasis” (Laffont and Tirole, 1994)
- ◆ “In practice, incentive regulation [for energy companies] is more a complement to than a substitute for traditional approaches to regulating legal monopolies” (Joskow, 2006)

What is Incentive Regulation?

From a regulatory-practice perspective, PBR can be (a combination of) many things:

- ◆ A targeted "incentive add-on" to traditional regulation
- ◆ A tool that increases regulatory lag to
 - provide more explicit efficiency incentives and
 - reduce administrative burdens through less frequent rate cases
- ◆ An alternative form of regulation that provides firms with incentives to both reduce costs and supply superior services
- ◆ Light-handed regulation during industry restructuring to provide companies with the flexibility needed when facing increasing (but still insufficient) competition for their services
- ◆ An approach that addresses (and takes advantage of) the information asymmetry between firms and their regulators

Why Move to PBR?

Compared to cost-of-service regulation, PBR can:

- ◆ Provide greater incentives for efficiency
 - Lower rates than otherwise in the long run
 - Allows for “win–win” (rates down and profits up)
- ◆ Reduce direct costs of regulation
 - Less frequent rate cases
- ◆ Provide pricing flexibility needed in partly-competitive markets (e.g., telecom price caps)

But:

- ◆ Added complexities
- ◆ More dependent on uniform accounting system and reporting requirements
- ◆ Difficulties with large capex
- ◆ Increases risk and uncertainty in utility earnings
- ◆ Can have unintended consequences

Attributes of Well-Designed PBR Mechanisms

Successful PBR mechanisms tend to conform to four basic principles:

◆ **Simplicity/Transparency:**

- Make it simple and transparent enough to elicit public acceptance
- Avoid temptation to add ever more layers of complexity
- Avoid ambiguous design and implementation details
- Limit increases in administrative burdens

◆ **Fairness:**

- Create a win-win situation for the company, customers, and regulators
- Recognize current cost of service
- Address rate structure and avoid cross subsidies (e.g. in telecom)
- Recognize limits to one-size-fits-all approaches

(continued...)

Attributes of Well-Designed PBR Mechanisms

Four basic principles (continued...)

◆ Proper Motivation:

- Provide incentives consistent with policy goal
- Avoid “factor bias”
- Relate to the objectives of the enterprise
- Avoid distraction by costs beyond managerial control
- Be consistent with (increasing?) competitive environment

◆ Staying Power:

- Assure commitment from the public, regulators, and utilities
- Limit rewards or penalties to politically and operationally acceptable levels
- Avoid ambiguous implementation details and rebasing provisions
- Avoid retroactive revisions and send consistent set of regulatory signals to support long-term efficiency gains

Important Differences: Energy vs. Telecom

The PBR experience from telecom industry cannot be applied directly because of key differences:

- ◆ Distribution companies do not face rapidly emerging competition for and bypass of their unbundled regulated service
- ◆ Limited opportunities to offer unregulated services
- ◆ Much slower rate of technological change provides more limited opportunities for efficiency gains
- ◆ Increasing (not decreasing) cost environment
- ◆ Lumpy energy infrastructure investment and replacement needs
- ◆ PBR for bundled services (if any) require different mechanisms for different cost categories (e.g., commodity vs. base rates)

Types of PBR Used in Energy Industry

PBR for energy companies has taken on many forms and combinations:

- ◆ “RPI-X” type regulatory plans:
 - Automatic rate adjustment mechanism (“ARAM”)
 - Price caps (also provides rate and service flexibility)
- ◆ Rate freezes and rate case moratoria (“RPI-RPI”)
- ◆ Benchmarking and yardstick approaches
- ◆ Cost and earnings sharing mechanisms
- ◆ Targeted incentives for:
 - Procurement costs (fuel, purchased power)
 - Plant operations (power plant availability and efficiency)
 - “External” system costs (losses, congestion, ancillary services)
 - Infrastructure investments (mains replacement, transmission, renewables)
 - Non-cost goals: reliability, service quality, end-use efficiency (DSM)

Basic Considerations for “RPI-X” Mechanisms

Even RPI-X mechanisms (perhaps the most popular and most visible form of PBR) can take on many forms:

- ◆ Price caps vs. automatic rate adjustment mechanism
- ◆ Applied to rates, revenue, or revenues per customer
- ◆ RPI based on input cost or general inflation indices
- ◆ X based on forecast costs or productivity trends
- ◆ Additional factors for pass-through of uncontrollable costs and capital expenditures
- ◆ Term: typically 3-7 years with or without rebasing
- ◆ Reopeners and rebasing provisions: rate levels vs. only rate path
- ◆ With or without earnings sharing
- ◆ With or without service quality incentives

Incentive Spectrum: Range of COS and PBR

- ← **Pure COS: rates equal to cost of service**
- ← Alberta COS: annual rate cases, forward test-year with true-up
- ← US COS: rate cases every few years, historic or forward test-year without true-up, possibly add-on incentives for specific items
- ← US rate case moratoria: 3-5 year rate freeze, historic or forward test-year, possibly earnings sharing and add-on incentives
- ← UK RPI-X: rates and X-factor to recover a company forecasted cost of service, reset both rates and X-factor every 5 years
- ← Price Caps for US/Can Telecom, US Oil pipelines: company-specific starting point, industry-wide rate trends, (almost) no rebasing
- ← **Pure PBR: incentives like in competitive markets**

PBR Plans With “Options”

PBR mechanisms can also be designed to provide regulated firms with a menu of options:

- ◆ Used in the UK and elsewhere when setting targets is difficult
- ◆ Basic structure of PBR options:
 - More aggressive targets combined with larger benefits to firm (e.g., less sharing for higher X factors in RPI-X mechanisms)
 - Pure price cap (without sharing) can be one option
 - Remaining on cost-of-service could be another option
- ◆ Benefits of PBR options:
 - Induces companies to choose most aggressive target they can reasonably expect to achieve
 - Reduces risk of imposing too stringent or too lenient PBR regimes
 - More likely to create win-win outcomes for firms and their customers

PBR Myths

Experience shows there are a number of “incentive regulation myths,” including:

- ◆ PBR differs fundamentally from traditional rate-of-return regulation
- ◆ PBR is “bribing” utilities to do what they already know they should be doing
- ◆ PBR that works for one firm will also work for others
- ◆ The more performance measures, the better the plan
- ◆ Gains for the regulated firm necessarily come at the expense of consumers
- ◆ Substantial profits by the regulated firm indicate a failure of PBR
- ◆ Firms are always better off without earnings sharing while consumers are always better off with earnings sharing
- ◆ Providing choices of different PBR mechanisms is good for firms but bad for customers

(Based in part on Sappington and Weisman, 1996, and Weisman and Pfeifenberger, 2003)

PBR Pitfalls to Avoid

Experience with PBR also points to potential pitfalls:

- ◆ Fail to define objectives and expectations at the outset
- ◆ Underestimate effort to fully develop PBR plan and key design parameters
- ◆ Design overly complex mechanisms that neither consumers, nor companies or policy makers fully understand
- ◆ Create administrative burden by over-engineering the mechanisms and reporting requirements
- ◆ Ignore data limitations and differences across companies
- ◆ Assume differences in companies and data can be addressed fully through statistical means
- ◆ Fail to distinguish between factors within and outside of a company's control
- ◆ Abandon or modify PBR based on conclusion that increased company profits must mean consumers are worse off
- ◆ Fail to implement safeguards that avoid politically and operationally unacceptable outcomes

Additional Reading

- Ofgem, *History of [UK] Energy Network Regulation*, Feb. 27, 2009.
- Joskow, “Incentive Regulation in Theory and Practice: Electricity Distribution and Transmission Networks,” *CWPE No. 0607 and EPRGWP No. 0511*, Feb. 2006.
- Sappington, “Regulating Service Quality: A Survey,” *Journal of Regulatory Economics*, March 2005.
- Weisman and Pfeifenberger, “Efficiency as a Discovery Process: Why Enhanced Incentives Outperform Regulatory Mandates,” *The Electricity Journal*, Jan/Feb 2003.
- Vogelsang, “Incentive Regulation and Competition in Public Utility Markets: A 20-Year Perspective,” *Journal of Regulatory Economics*, Vol. 22(1), July 2002.
- Lowry and Kaufman, “Performance-based Regulation of Utilities,” *Energy Law Journal*, 2002.
- Carpenter, Liu and Pfeifenberger, “REx Incentives: PBR Choices that Reflect Firms’ Performance Expectations,” *The Electricity Journal*, Nov. 2001.
- Sappington, Basheda, Hanser and Pfeifenberger, “Status and Trends of Performance-Based Regulation in the U.S. Electric Utility Industry,” *The Electricity Journal*, Vol. 14(8), Oct. 2001.
- Bernstein and Sappington, “How to Determine the X in RPI-X Regulation: A User’s Guide,” *Telecommunications Policy*, 2000 and 2001; “Setting the X Factor in Price-Cap Regulation Plans,” *Journal of Regulatory Economics*, July 1999.
- Sappington and Weisman, *Designing Incentive Regulation for the Telecommunications Industry*, AEI, 1996.
- Pfeifenberger and Tye, “Handle with Care: A Primer on Incentive Regulation,” *Energy Policy*, Sept. 1995.
- Laffont and Tirole, *A Theory of Incentives in Procurement and Regulation*, MIT, 1994.
- FERC, *Policy Statement On Incentive Regulation*, 1992.

About The Brattle Group

North America



Cambridge, MA



Washington, DC



San Francisco, CA

Europe



London, England



Brussels, Belgium



Madrid, Spain

About The Brattle Group

The Brattle Group provides consulting and expert testimony in economics, finance, and regulation to corporations, law firms, and governmental agencies around the world.

We combine in-depth industry experience, rigorous analyses, and principled techniques to help clients answer complex economic and financial questions in litigation and regulation, develop strategies for changing markets, and make critical business decisions.

Climate Change Policy and Planning
Cost of Capital
Demand Forecasting and Weather Normalization
Demand Response and Energy Efficiency
Electricity Market Modeling
Energy Asset Valuation
Energy Contract Litigation
Environmental Compliance
Fuel and Power Procurement
Incentive Regulation

Rate Design, Cost Allocation, and Rate Structure
Regulatory Strategy and Litigation Support
Renewables
Resource Planning
Retail Access and Restructuring
Risk Management
Market-Based Rates
Market Design and Competitive Analysis
Mergers and Acquisitions
Transmission

Johannes Pfeifenberger (hannes.pfeifenberger@brattle.com)

Paul Carpenter (paul.carpenter@brattle.com)

www.brattle.com