Incentives for Service Quality: Getting the Framework Right

The development and success of financial incentives for service quality in price cap formulae and performance-based regulation is being undermined by a diversity of approaches that differ in principle. Not all of them can be right, and a consensus is needed on the proper framework.

Brian Williamson

Brian Williamson *is Senior Consultant at the London office of National Economic Research Associates (NERA), specializing in regulation and the economic and financial analysis of issues in network industries. He has advised clients on the design of price cap formulae covering price and service quality, and advised both companies and government agencies on the governance and design of regulatory institutions. He holds an M.Sc. in economics from the London School of Economics.*

Around the world there is growing experience in providing financial incentives for service quality performance in price cap and performance-based rate plans (where quality dimensions might include, for example, the frequency and duration of interruptions to supply and responsiveness to customer inquiries). A diversity of approaches and suggested approaches that differ in principle is emerging, however, and not all of them can be right. While the details of incentive plans will appropriately be specific to circumstance and location, the broad framework should involve some common features.

In judging alternatives, two basic questions should be asked. (1) Is the approach consistent with agreed revenue allowances (and in turn with a reasonable assurance of cost recovery for utilities that ensures continuity of service and efficient financing of operations)? (2) Does the approach provide incentives consistent with customers' preferences over price versus quality at the margin, while maintaining incentives for efficient operations?

In considering these questions in relation to alternative approaches, I draw on experience of financial incentives for service quality in the United Kingdom, United States,

  PII S1040-6190(01)00208-1

and Australia. I also suggest approaches to address specific questions in relation to the design of service quality incentive schemes, some of which have been raised by previous authors.

I. What Is the "Right" Level of Quality?

In principle the efficient level of quality is the level that maximizes the difference between how much customers value quality and how much it costs, as shown in **Figure 1**. An alternative way of thinking about the efficient quality level is to consider the point where the marginal costs and benefits of changes in quality are equal (where the tangents to the curves in Figure 1 are parallel). For quality below the efficient level of quality, an extra unit of quality generates more benefit for customers than it costs, while above the efficient level of quality the cost of an extra unit exceeds the benefit.

No single individual, regulator, or company will ever have all the information required to devise a "plan" to achieve the efficient outcome illustrated in Figure 1. Customers' preferences may be revealed by their decisions over alternative quality and price bundles (but only in a market context), while companies have information on their own costs (albeit imperfect), and regulators have access to published information on costs (in particular the figures in the regulatory accounts) and available estimates of customers' preferences. Further, the efficient outcomes are dynamic—changing in view of changes in underlying costs and preferences over time.

The problem of incomplete information and dynamics imply that incentives (rather than plans) are crucial to achieving efficient outcomes. In this regard regulation and competition differ fundamentally, and lessons from experience in competitive markets do not necessarily carry across to the requirements of regulation in monopoly markets.

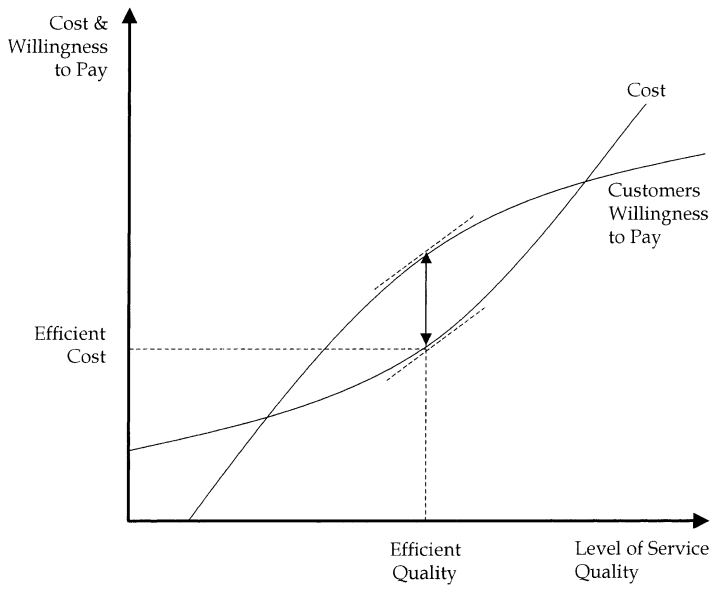


Figure 1: The Costs and Benefits of Quality

II. Competition versus Monopoly Provision

In competitive markets, customer choices provide information and incentives for companies to provide appropriate service quality at least cost, and customers and firms learn by observing the choices and quality offerings of others. In particular, higher quality *per se* is not rewarded in competitive markets because customers do not always consider it worthwhile to pay for higher quality. The lesson for quality regulation is that the achievement of higher quality should not necessarily be considered a superior outcome, and incentives for service quality should be designed to avoid rewarding higher quality *per se.*

While comparisons of quality outcomes alone clearly have their limitations, it might be hoped that comparisons of costs alongside quality would provide a basis for assessing overall performance. After all, conventional wisdom suggests a direct association between service quality and cost. Cost and quality across regional monopolies, however, may exhibit a negative relationship, or no particular relationship, since in environments where quality is more expensive, the efficient level of quality may be lower. For example, efficient electricity services to rural customers may involve lower quality and higher costs than services to urban customers, since

 PII S1040-6190(01)00208-1

line lengths per customer are greater. In contrast, in markets where service quality is differentiated according to customer willingness to pay, and services are produced and sold in similar operating environments, quality and cost exhibit the familiar positive association.

The key lessons for regulation are that judging efficient cost and quality outcomes by comparing utilities' performance is problematic, and that regulators need to act on customers' behalf by representing their preferences in ways that align utilities' and customers' interests.

III. Alternative Regulatory Approaches to Service Quality

Regulators either implicitly or explicitly take account of customer preferences in setting allowed revenues and quality expectations by application of a price cap formula. Establishing and fixing the "right" level of quality for the duration of a price cap plan is too much to ask, given the imperfect information available and unpredictable nature of changes in costs and technology over time.

A more realistic goal is to establish baselines via an assessment of available information on the costs and benefits of alternative levels of quality. Account should also be taken of the possible consequences of "mistakes" in terms of an unanticipated excess or shortfall of quality. In other words, the costs of over- and under-provision of quality should be considered in addition to the costs and benefits of alternative expected outcomes. Scrutiny of investment plans and the costs of planned quality enhancements are an inescapable part of the process. It is therefore important that regulators face their own incentives and constraints (due process, appeals, and accountability mechanisms) to align their conduct with customers' long-term interests.[1]

During the period between price control reviews, minimum standards and/or financial incentives for service quality are required to prevent utilities from cutting costs by skimping on quality. Minimum standards may be appropriate in relation to safety (where the costs of harm from inadequate quality rise steeply as quality decreases).[2] Where the costs of harm from quality reductions rise less steeply, allowing utilities to respond to financial incentives for quality may be more efficient. This could be so, for example, in relation to the frequency or duration of interruptions to supply (at least over some range of performance above agreed minimum standards).

Fixing the "right" level of quality expectations by application of a price cap plan is too much to ask.

The flexibility that financial incentives allow, and the fact that utilities are responding to continuous incentives rather than just aiming to meet minimum standards, can contribute to more appropriate levels of service quality being delivered at lower cost. Financial incentives allow utilities to respond to changes in the technology and costs of quality, or to external events such as exceptional weather conditions, by varying quality delivered where it is cost-effective to do so. Incentives to innovate and "reveal" efficient cost are also provided by financial incentives.

In implementing financial incentives for service quality, a number of questions arise. What service dimensions and measures should be included under financial incentives? How should baselines be decided? On what basis should incentives be set? These questions are considered below alongside experience in the United Kingdom, United States, and Australia.

IV. Building Blocks of a Service Quality Incentives Scheme

A. What Dimensions and Measures of Service Quality Should Be Included?

Offering financial incentives for some dimensions of service quality and not others introduces an incentive to neglect those not covered (because imperfectly monitored, but profit-motivated, employees within utilities may have an incentive to reprioritize their effort). It is therefore impor-

  PII S1040-6190(01)00208-1

tant to cover all the dimensions of service that customers value with minimum standards and/or financial rewards—irrespective of whether performance is currently "adequate."

The focus should be on dimensions of quality that customers value directly rather than intermediate measures of reliability (which may nevertheless be of interest to the utility itself, for example, high-voltage system failure rates or water mains leakage rates). In addition, objective, observable, and verifiable measures of performance should be developed, collected, and assessed. Factors that prior judgment suggests would alter customers' willingness to pay for variations in the same dimension of service quality should also be considered (for example, whether prior announcement is given of interruptions to supply).

Lastly, customers can be expected to value current and expected levels of service rather than trends or past performance *per se* (though past performance may shape expectations of future service).

B. Should Relative or Absolute Performance Be Compared and Rewarded?

Customers' preferences relate to the service quality they receive versus the cost—so the performance of their network service provider relative to others would not appear to be a relevant consideration in terms of their willingness to pay. Nevertheless, the prospect of moving to output-based regulation and mimicking competition in some way may appear appealing to regulators if it is thought that this would reduce their need to rely on each company's actual costs, or to have to represent customer preferences.

The U.K. electricity and gas regulator Ofgem (the Office of Gas and Electricity Markets) has suggested an approach that would involve the assessment of some measure of the "value for money" provided by electricity distributors based on their costs and quality of service, and rewards at least in part based on the performance of companies relative to one another.[3] In addition, financial rewards based on relative service quality performance currently apply in the U.K. water industry.[4] While regulators and utilities may use comparisons as a way of checking that feasible alternatives have been explored—in essence as a learning mechanism—assessing and rewarding relative quality or value for money involves practical difficulties and is conceptually not well founded for a number of reasons.

The focus should be on dimensions of quality that customers value directly, rather than intermediate measures of reliability.

First, a relatively high-cost/low-quality provider may nevertheless be offering superior "value for money" compared to other providers, given its unique cost circumstances. Further, any meaningful comparison (in terms of overall efficiency) of alternative levels of cost and quality for an individual company, or across companies, must take into account customers' willingness to pay. Consideration of each individual company's actual costs and customers' preferences cannot therefore be sidestepped in the regulation of monopoly.

Second, the use of statistical techniques to normalize costs, let alone costs and quality, is far from straightforward.[5] As Ron Davis noted in *The Electricity Journal*,

> U.K. regulators have yet to discover a rigorous method for setting reliability standards that takes into account the performance of the companies relative to each other while also addressing the extent to which each company has improved its own position over time. In the future, statistical benchmarks for reliability may be applied to handle this "apples to oranges" problem inherent in comparing performance data across different utilities.[6]

In addition, the Massachusetts Department of Telecommunications and Energy noted that all customers will not receive the same service for legitimate reasons, and in response to suggestions that statistical techniques might account for variations, noted "concern regarding the effectiveness and complexity of

 PII S1040-6190(01)00208-1

using these statistical techniques in this context."[7]

Third, basing rewards on the performance of companies relative to one another is conceptually flawed, irrespective of the robustness of any assessment of relative costs and quality. Basing rewards on relative performance may introduce perverse incentives for utilities to "leap frog" one-another's quality of service even where the costs of increments in quality exceed the benefits to customers.[8] In addition, basing rewards on relative performance would make the financial returns to quality increments unpredictable—thereby complicating investment planning, and potentially distorting investment choices and raising the cost of capital.

The legitimate purpose of service quality comparisons should be as a basis for further scrutiny of exceptional quality or costs of quality, and not as a basis for setting individual or industry wide baselines *per se*, or as a basis for setting rewards. The Office of the Regulator General (ORG) in Victoria, Australia, sets out clearly the view that differences in networks and operating environments may explain differences in quality of supply, but that "the Office expects the distributors to consider whether those differences indicate that there is scope for significant performance improvement in the near term." While the ORG would have preferred to adopt common benchmarks for sub-service categories such as central business district, urban, short and long rural feeders, in the end company-specific targets were set.[9]

While regulators can and should act on behalf of customers by ensuring that companies face financial rewards that reflect the valuation customers place on variations in service quality delivered, such incentives are best delivered via financial incentives based on variations in company-specific performance against company-specific baselines.

Basing rewards on the performance of companies relative to one another is conceptually flawed.

C. How Should Baseline Quality Be Set?

This question was identified as a key issue in an article by Barbara Alexander in *The Electricity Journal* that noted, "One of the most perplexing issues is how to set the baseline from which to measure changes in service quality."[10] Baseline quality is crucial from the point of view of utilities' expected revenues, and should therefore be set consistent with the quality expectations agreed in the price cap plan.[11] In other words, the incentive scheme should not reopen the price control, either in terms of the revenues that have been allowed for each company, or the quality of supply expectations that were agreed with each company consistent with allowed revenues.[12]

If the incentive scheme is not symmetric around the baseline, as it will be if poor performance is penalized and good performance is not rewarded, then the net expected cost of incentive payments should be added to allowed revenues to ensure they are consistent with baseline quality expectations. An illustrative example of this is the factoring of expected payments under a guaranteed customer service scheme (which includes payments to customers for substandard service) into revenue requirements for distributors in Victoria, Australia.[13] An alternative approach, which reduces the impact of variations in quality on revenues, is to introduce a "deadband" over which no variation in allowed revenues occurs for deterioration in quality below baseline levels. However, this approach has the disadvantage that it eliminates incentives within the range of the deadband.

D. How Should Financial Rewards for Quality Be Set?

For the regulator to establish the efficient level of quality, a cost-benefit analysis is required, taking account of customers' willingness to pay for each dimension of quality and each individual company's costs of providing different levels of quality. In principle, however, the regulator need only know one half of this informa-

  PII S1040-6190(01)00208-1

tion—customers' willingness to pay—if an incentive scheme is used. This is potentially a very attractive feature of incentives over what would otherwise amount to central planning.

By offering a schedule of financial rewards based on customers' marginal willingness to pay, the regulator can induce the company to reveal the efficient level of quality based on its private knowledge of costs. Such an incentive scheme can be represented by the following relationship (where "reward" refers to a decreasing penalty or increasing total reward):

Marginal cost of quality
= marginal reward for quality
= customers' marginal willingness to pay for quality

Figure 2 represents costs and benefits per unit change in quality (i.e., the point in Figure 1 where the curves are parallel is represented here as the intersection of the marginal cost and benefit lines).

The (constant) marginal reward to the company that would ensure an efficient outcome is shown as the horizontal dashed line (any reward schedule passing through the efficient point and lying between the marginal cost and marginal willingness to pay lines would incentivize companies to provide efficient levels of quality and leave net benefits for customers after incentive payments). For quality that is initially less than the efficient level, the company then receives greater reward per unit increase in quality than the cost, and therefore has an incentive to increase quality. Once the efficient level of quality is reached, the reverse is true, and increasing quality now costs more than the reward (while decreasing quality is profitable).

Figure 2 highlights three rules of thumb that can be used in the design of efficient financial incentive schemes:

- If the marginal costs or benefits of quality were known *at the efficient level of quality,* then the appropriate reward is given by this value.
- If the reward is set equal to the benefits of quality increments around *the current level of quality,* and this estimate is periodically revised in line with new information on the benefits of quality increments, then convergence on the efficient level of quality should occur in a stepwise fashion.
- For quality initially below the efficient level the appropriate reward is bounded above by customer willingness to pay and below by marginal cost.

While in principle the regulator does not need to know the company's costs of delivering alternative levels of quality to design an incentive scheme, in practice information on customer marginal willingness to pay is likely to be imperfect, and the third rule of thumb then suggests that information on marginal costs is likely to be considered as a lower bound check in designing financial incentives when quality is thought to be initially below the efficient level. Improving estimates of customer willingness to pay, using techniques such as contingent valuation, should nevertheless be a priority.[14]

The Office of the Regulator-General, Victoria, Australia, discusses a principle along these lines:

> The amount of revenue that distributors stand to gain or lose under the incentives should be limited, but large enough to provide meaningful commercial incentives at the margin. The amount of the incentives should

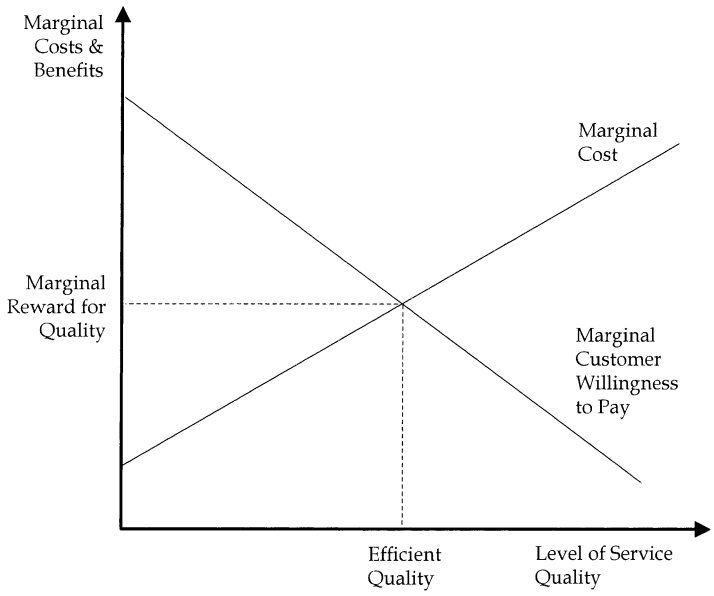


Figure 2: The Costs and Benefits of Quality

PII S1040-6190(01)00208-1

be greater than the cost to distributors of achieving an increment of reliability, but less than the value that customers place on that increment of reliability.[15]

(Of course this rule of thumb can only apply up to the point where efficient levels of quality are reached.)

Table 1 summarizes the service quality elements of the performance-based regulation plan applying to San Diego Gas & Electric by the California Public Utilities Commission.[16] The plan illustrates a number of features including baseline benchmarks, dead-bands, and incentive rates per unit change in performance. In each case, the "live-band" is symmetric, with equal potential for rewards and penalties, and each performance indicator includes caps on the maximum reward or penalty. Table 1 provides a practical illustration of detailed design features that are discussed below.

E. Should Rewards Be "Symmetric"?

Another question raised previously in Barbara Alexander's article in *The Electricity Journal* was, "Should the utility be rewarded for service quality above the baseline or only penalized for failure to achieve at least the baseline level?"[17] Figure 2 suggests that "rewards" should apply either side of the baseline to provide appropriate incentives irrespective of the baseline. The costs of quality may also change unpredictably over time—and asymmetric incentives may then no longer apply over the relevant range. Finally, a symmetric approach is simple and ensures that expected payments or rewards do not reopen baseline-allowed revenues and quality expectations.[18]

F. Should Dead-Bands Apply?

Dead-bands may be suggested as a way of reducing variability of utilities' revenues on small (perhaps statistically insignificant) variations in quality. However, in common with the problems discussed in relation to asymmetric schemes, dead-bands introduce an interval where incentives no longer apply—thereby introducing an unnecessary and potentially undesirable dependence between the quality baseline and incentives. Dead-bands only shift the problem. They do not resolve concerns over small variations in performance contributing to variations in revenues. Indeed, dead-bands may make the problem worse if payments and rewards are discontinuous at the boundaries of dead-bands.

Where an asymmetric scheme is implemented, however, dead-bands may have a role in limiting the impact of variations in quality on expected revenues. For example, the financial incentives proposed by the Massachusetts Department of Telecommunica-

Table 1: San Diego Gas & Electric's Service Quality Performance Incentives Scheme, 1999–2002

Performance Indicator	Standard	Benchmark	Dead-band	Live-band	Unit of Change	Incentive per Unit ($ thousands)	Maximum Incentive ($ millions)
Safety	OSHA[a]	8.80	±0.20	±1.20	0.01	25	±3
Reliability	SAIDI[b]	52 minutes[c]	0	±15	1.00	250	±3.75
	SAIFI[d]	0.90 outages/year	0	±0.15	0.01	250	±3.75
	MAIFI[e]	1.28 outages/year	0	±0.30	0.015	50	±1
Customer satisfaction	"very satisfied"[f]	92.5%	±0.5%	±2.0%	0.1%	75	±1.5
Call center response		80%[g]	0	±15%	0.1%	10	±1.5

[a] Occupational Safety and Health Administration Frequency standard.
[b] System Average Interruption Duration Index.
[c] Excluding underground failures for 1999–2001; 73 minutes including underground failures for 2002.
[d] System Average Interruption Frequency Index.
[e] Momentary Average Interruption Frequency Index.
[f] Consumer satisfaction with recent service transactions provided by the company.
[g] Answered in 60 seconds, measured on an annual basis.

  PII S1040-6190(01)00208-1

tions and Energy are asymmetric, involving penalties for underperformance alone, and include a dead-band of one standard deviation from the company's historical performance.

G. Should Maximum Rewards and Penalties Apply?

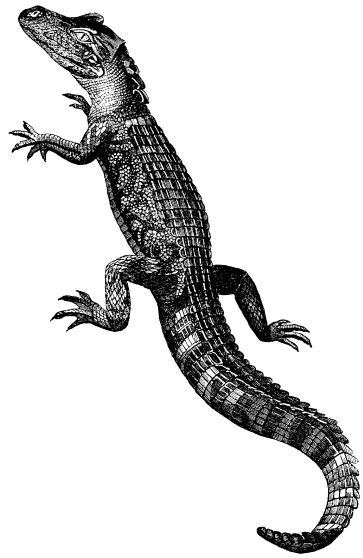
If the regulator could be confident that the rewards and penalties on offer corresponded to customers' marginal willingness to pay, then there would be no good reason to cap rewards and penalties (after all, potential rewards and penalties are not capped in this way in competitive markets). With imperfect information, however, the regulator risks setting rewards too high or too low, and risks incentivizing inappropriate levels of service quality. In addition, incentives involve a tradeoff between risk and reward.[19]

The treatment of maximum rewards and penalties may also depend on whether any provision is made for limiting the financial impact via the incentives scheme or compensating for exceptional events such as severe weather. Time averaging may also be used to reduce the impact of exceptional events. While time averaging reduces the impact in any given year, however, it prolongs the impact of an exceptional event.

F. Should an Index of Service Quality Be Used?

Appropriate marginal rewards can be implemented for each dimension of service quality individually without the need for an index of service quality. However, indices of service quality have been constructed and applied in the telecommunications and energy sectors in the United States, and to the water industry in the United Kingdom.

If an index is used, it is important to bear in mind that the combined impact of the range of service quality variation over which a



score is generated, the weights used to combine scores, and the corresponding revenue adjustment, together determine incentives, and so should be related to marginal customer willingness to pay (and potentially costs, given imperfect information on willingness to pay).

V. Conclusion

Financial incentives for service quality are likely to see increasing application in price cap and performance-based regulatory plans around the world. The way to apply such incentives can be identified from a basic application of economics to the problem. Incentives should be based on customers' marginal willingness to pay, and reflect the performance of each individual company relative to a baseline set consistent with agreed allowed revenues and quality expectations. In reality, however, the costs of variations in quality should also be considered given incomplete information on customer preferences. These conclusions suggest a clear agenda for empirical work to estimate customer preferences and the costs of quality increments going forward. ■

Endnotes:

1. Concern in relation to the adequacy of due process is arguably greater in the United Kingdom than in Australia or the United States, where stronger checks and balances are in place. Brian Williamson, *U.K. 'Incentive' Regulation: International Best Practice? in* Regulatory Rev. 2000/2001–Millennium Edition (Bath, U.K.: Center for the Study of Regulated Industries, University of Bath School of Management, February 2001), available at http://www.nera.com/reports/show_report.cfm?rid=2300 (May 31, 2001).

2. Quantity targets (minimum standards) may be preferred over prices (incentives) when the marginal benefit curve is steeper than the marginal cost curve and there is uncertainty over marginal costs. M.L. Weitzman, *Prices vs. Quantities*, Rev. Econ. Studies 41 (4) Oct. 1974, at 477–91.

3. Information and Incentives Project: Incentive Schemes—Initial Thoughts, Jan. 2001, http://www.ofgem.gov.uk/docs2001/iip_incentives_intial.pdf (May 31, 2001).

4. Rewards of ±0.5 percent of revenues were introduced for water companies in

 PII S1040-6190(01)00208-1

the United Kingdom in 1999 based on performance with respect to an index of service quality *relative* to other companies. However, the Director General of Water Services noted in relation to performance league tables in Information Note 40 (Oct. 2000), "As companies' performance improved across the industry, comparative assessments became less useful. There was also the risk of drawing distinctions that the customer might not perceive as significant, and of encouraging companies to invest in systems that did not meet customers' priorities."

5. Siôn Jones, *Comparatively Poor? A Comment on the Ofwat and Ofgem Approaches to the Assessment of Relative Efficiencies*, NERA Topic 22, Oct. 1999, http://www.nera.com/reports/show_report.cfm?rid=2040 (May 31, 2001).

6. Ron Davis, *Acting on Performance-Based Regulation*, Elec. J., May 2000, at 18.

7. Massachusetts Department of Telecommunications and Energy, Docket 99–84, Aug. 2000.

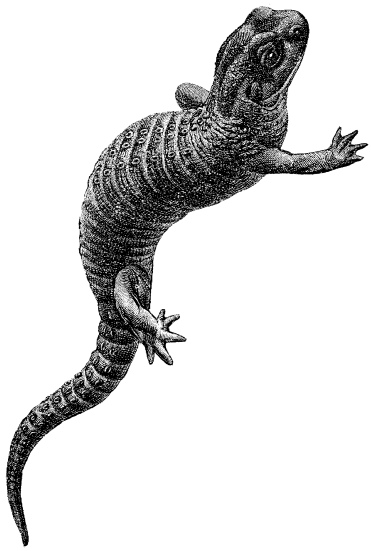
8. Brian Williamson and Graham Shuttleworth, *Ofgem IIP: Analysis of Basis for Rewarding Service Performance*, June 9, 2000, http://www.nera.com/reports/show_report.cfm?rid=2133 (May 31, 2001).

9. The ORG stated, "The Office's preference was to set common benchmarks within each category [CBD, urban, short and long rural feeders], but it recognises that, even within those categories, there are differences between the distributors' networks which explain the differences in their reliability levels to a significant extent. For example, the low benchmark for CitiPower's urban feeders is consistent with the fact that those feeders have the shortest average length in the urban category and the highest proportion of underground cable. Similarly, AGL's urban feeders are shorter on average than all distributors' except CitiPower's." Office of the Regulator-General, Victoria, *Guidelines to Distributors on Price Review Submissions: Base-Case Levels of Service Quality*, Appendix A, June 30, 1999, at 5.

10. Barbara Alexander, *How to Construct a Service Quality Index in Performance-Based Ratemaking*, Elec. J., April 1996, at 50.

11. Provided financial incentives involve a constant rate of variation in allowed revenues per unit variation in service quality, incentives at the margin are unaffected by the baseline level of quality.

12. An illustration of this principle is provided by the reasoning of the Office of the Rail Regulator in the United Kingdom that "incentives will be independent of the benchmark itself, hence the benchmark is only relevant in terms of



the supplementary access charge required to compensate Railtrack for the expected costs of the performance regime," and that benchmarks be set at the level of expected performance so that "there would be no need for any supplementary access charge." *Office of the Rail Regulator, The Periodic Review of Railtrack's Access Charges: Draft Conclusions*, July 2000, at 109.

13. Office of the Regulator-General, Victoria, *Electricity Distribution Price Determination 2001–05*, Sept. 2000, at 28, http://www.reggen.vic.gov.au/elec_13.htm (May 31, 2001).

14. Yongxin Cai, Iraj Deilami, and Kenneth Train, *Customer Retention in a Competitive Power Market: Analysis of a "Double-Bounded Plus Follow-ups" Questionnaire*, 19 Energy J., No. 2, 1998, at 191–215; and Andrew Goett, Kathleen Hudson, and Kenneth Train, *Customers' Choice Among Retail Energy Suppliers: The Willingness-to-Pay for Service Attributes*, 21 Energy J., No 4, 2000, at 1–28.

15. Office of the Regulator-General, *2001 Electricity Distribution Price Review–Draft Decision*, May 2000, at 53.

16. California Public Utilities Commission. Decision No. 99-05030, May 1999.

17. S*upra* note 10, at 51.

18. Customer willingness to pay can be expected to decline at the margin as quality is increased as depicted in Figure 2. While this might suggest that some asymmetry of incentives is justified, the decline in marginal willingness to pay is likely to be small for the variations in quality in question, and asymmetry introduces the problem of estimating the net expected financial cost of the incentive scheme to utilities.

19. In the United Kingdom, the Economic Regulation Group of the Civil Aviation Authority, in proposing a price cap formula for the National Air Traffic Control System (NATS), noted:

> ERG's preliminary view is that while there is theoretical merit in adopting a sufficiently large delay term to align NATS' incentives to provide capacity with those of users, the costs of so doing in terms of introducing an element of risk arising from using systems of measurement and attribution in ways that they were not originally designed may outweigh the benefits. ERG is therefore minded to recommend a delay term in the charges term with limited impact.

Economic Regulation Group, Civil Aviation Authority, *National Air Traffic Services Public Private Partnership—Setting the Charge Control for Enroute Service in U.K. Airspace for the First Five Years*, April 2000, at 93.

  PII S1040-6190(01)00208-1