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## Wired for experience

### BALANCING INCENTIVES IN NETWORK REGULATION

*When undertaking a price review, the regulator's task is to decide whether the existing system is achieving its main goal: protecting consumers' interests. This means creating the right incentives for firms to become more efficient and pass the benefits on to customers – a difficult balance to achieve, as many regulators have found. In preparation for the next round of price reviews of transmission and distribution in both the electricity and gas sectors, Frontier Economics was commissioned by Ofgem to assess the balance of incentives in the existing system and suggest how it might be improved. The first opportunity to make such improvements is the electricity distribution review, due to come into effect in 2005.*

All network regulators strive to set the right balance in the incentives they set for monopoly businesses. And over time, they have learnt that the incentives they create may have unintended consequences, leading to the distortion of business decisions and "gaming" by regulated companies. A price review is a natural opportunity to reappraise the incentive design embodied in the price control arrangements. →

When Frontier Economics was asked to assist Ofgem in the review of the existing regime<sup>1</sup>, it was able to draw on experience in regulatory design in many different industries and parts of the world. This bulletin highlights some of the problems common to the regulation of all network industries, and the ideas that have recently been developed for addressing them.

### SHARING THE GAINS

When setting price controls, the first and obvious need is to provide an incentive to cut costs - while, of course, ensuring that the appropriate level of quality is maintained<sup>2</sup>. However, cost-cutting is not the ultimate objective of regulation. The regulator has to pass the cost savings on to the customer, which gives rise to perhaps the best-known dilemma in utility regulation.

The regulator can ensure the customer gets a share by periodically resetting price controls to reflect efficiency gains. But the more frequently this is done, the less the firm benefits from improving its efficiency, which in turn blunts the incentive to improve. So regulators have to take care to design a system that leaves providers with sufficient gains to stimulate further efforts to cut costs.

Price cap regulation, of the kind adopted by Ofgem, has resulted in substantial improvements in the cost efficiency of the UK's privatised utilities. Unit costs in electricity transmission and distribution, for example, have fallen by about half since privatisation in 1990. And prices for customers were reduced on average by 43% between 1995 and 2001. Therefore, Ofgem was successful in both inducing companies to cut costs and reducing prices for consumers.

Where regulators have found greater difficulty is in setting the right incentives for investment. On the one hand, there could be too much or too little quality if the incentives for investment spend and the rewards for maintaining or improving quality are out of balance. For example, firms facing pressure to cut costs will be tempted to delay investment, since the consequences of doing so are usually less immediate and obvious than the effects of cut-backs in operating expenditure. Low investment will show up later, in a loss of quality or of the revenue that could have been earned from extra sales. But unless the regulator provides incentives to achieve a certain level of quality, and to expand capacity to meet extra demand (or imposes penalties for failing to do so), there is a clear danger of under-investment by price-regulated companies. To alleviate this danger requires a clear system of incentives and an effective system for monitoring the ongoing quality of the networks. This in itself requires the regulator to strike the right balance between leaving investment decisions in the hands of the business and becoming so involved in the investment planning decisions of the business that the ultimate accountability for quality provision is blurred.

On the other hand, there could be excessive investment if the incentives between operating and capital expenditure are not properly balanced. As the figure below illustrates, for any profit retention period, the savings arising out of making operating expenditures are greater than those that arise from making savings in investment.

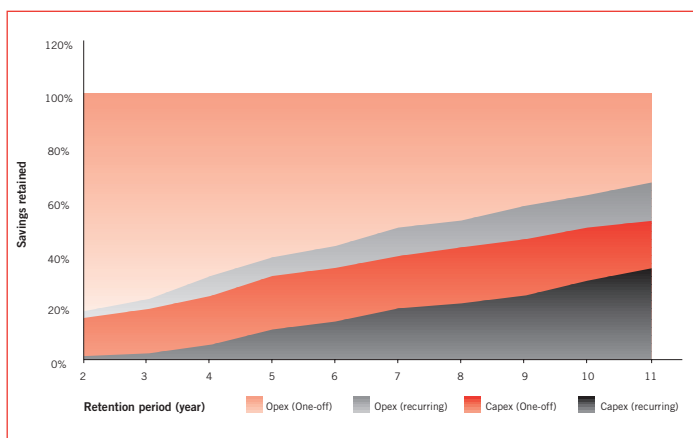


Figure 1: Reducing operating expenditure results in higher profits than does an equivalent reduction in capital expenditure

This difference arises because the methods of expensing operating and capital costs are not the same: operating cost is expensed in the same year as it is incurred, while capital cost is depreciated over the lifetime of an asset. Therefore, by cutting capital costs, a company earns only a fraction of the amount saved before the next price review removes it. On the other hand, savings in operating expenditure (one off) are fully retained by the company. If both operating and capital expenditure savings are of the same magnitude, then it is clear that a saving on operating expenditure is more rewarding for the companies than a similar reduction in capital expenditure. That is why companies, for example, may prefer to buy more expensive equipment (incurring capital cost) that requires less spending on maintenance (savings in operating cost), although it is not necessarily efficient. This type of behaviour is called *capitalisation of operating expenditure*. The problem is further exacerbated if the regulator sets a target for opex based on industry-wide benchmarking and a target for capex on a company specific basis.

Operating costs might be capitalised in two ways: either through reclassification of operating expenditure as a capital cost (for example, classifying maintenance cost as refurbishment which is considered investment), or by deciding to undertake capital expenditure when operating expenditure represents the most efficient option. Any reclassification would of course need to be judged by auditors to be consistent with OFGEM's guidelines for companies' regulatory accounts but there is some flexibility<sup>3</sup>. Either policy might lead to higher prices for customers. As long as this capitalisation game does not affect quality, then the only detriment to customers is that they simply pay more than they would otherwise do. If however, the capitalised operating expenditure does not contribute to maintaining or increasing the quality of the assets, then the regulatory danger is that prospective quality performance is falling, even though investment is apparently rising.

Consequently, as well as ensuring that cost and quality incentives are properly aligned, regulators must also ensure that the incentive arrangements for individual cost elements within the total cost base are also balanced. An approach that is becoming increasingly adopted in Europe (for example by the Dutch and Austrian regulators) and is being studied by Ofgem is to regulate prices on the basis of total cost performance.

### PICK YOUR MOMENT

In recognition of the importance of allowing companies to keep a share of the efficiency savings they achieve, Ofgem has set the period between price reviews at five years. During each period, companies retain the benefit of any further cost reductions they may achieve; at the next review, prices are then reset to ensure the customer benefits as well. This common feature of regulatory systems can, however, distort incentives to a troublesome degree.

The problem is illustrated by the figure below, which shows the profits from efficiency improvements retained by two companies. Company A makes efficiency improvements in the first year of a regulatory period, while company B makes them in the last year.

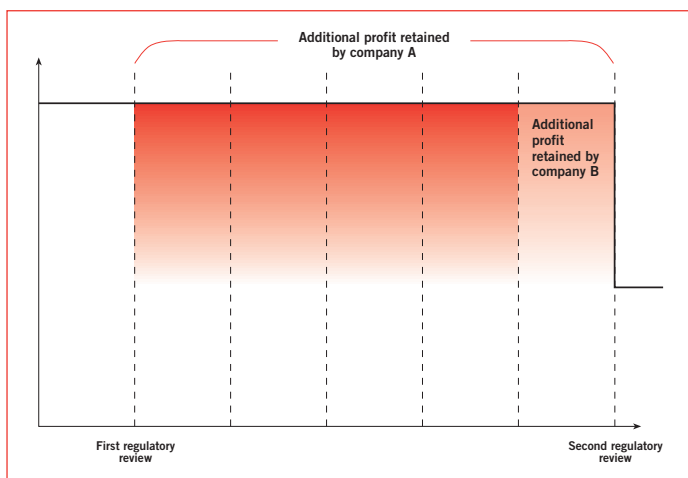


Figure 2: Early cost savings result in higher profits

Plainly, company B will retain the benefit for only the year in which it was made, while company A will retain it for an additional four years.

Incentives to cut costs therefore decline during the period between regulatory reviews. Moreover, towards the end of the period, there is a clear incentive to wait until the beginning of a new one – to engage in the kind of regulatory "game" that involves delaying, hiding or transferring cost savings between years. This distortion of business strategy is not merely theoretical; there is indeed some evidence to suggest that regulated companies in a number of sectors have delayed savings that could have been made in the last few years of a regulatory period and made rapid cost reductions immediately after a price review.


To solve this "periodicity problem", regulators have developed systems designed to make companies indifferent to the point in the period between reviews at which they make efficiency improvements. This approach was pioneered by the water regulator in England and Wales (Ofwat). The central idea that underpinned Ofwat's approach was that water companies should be able to retain the benefits of any efficiency saving for a fixed length of time (e.g., for five years), regardless of how close to the next price review they occur. The "incentive allowance" that a company receives in any particular year depends on savings made in previous five years. Companies that exceed their expenditure budget are not compensated for the excess above their budget. The only exception to this is where a company is able to agree, during a price control period, that additional capital expenditure is required and acceptable. This process is known as "logging up" (or down).

While the principle is clear enough, implementation may be complicated, since the regulator will need to gather reliable data on all years in a given period. At the last distribution review Ofgem, for example, only needed to analyse data for one year.

Another question that arises is whether allowances should be adjusted for unexpected changes in demand. On the one hand, the regulator's projections of demand could be inaccurate, so one can argue that the adjustments should be made for the difference between actual and projected demand. On the other hand, it is not clear that unexpected variations in demand over a period as short as five years have a sufficiently serious impact to warrant reopening of the cost projection. Any such intra-period changes tend to blunt incentives, not least by diverting executives' time into debates with regulators rather than company management. In our view, the second effect dominates; so there should be a strong presumption against re-opening reviews.

## CONCLUSION

As regulatory experience demonstrates, efforts to improve the efficiency of regulated companies can be inhibited by the unintended consequences of these interventions: namely, the distortion of incentives. Over the past few years, regulators have begun to pay increasing attention to the precise calibration of the bundle of incentives that make up a regulatory regime. In the UK, this progress has probably been reinforced by the realisation that the biggest efficiency gains are likely already to have occurred, and that the best route to promoting sustainable ongoing improvements in performance lies in effective incentive design and the removal of regulatory distortions.

<p><b>SOURCE</b></p>	<ol style="list-style-type: none"> <li>1. Our two reports are available at <a href="http://www.ofgem.gov.uk/ofgem/work/index.jsp?section=areasofwork/monopolypricecontrols">http://www.ofgem.gov.uk/ofgem/work/index.jsp?section=areasofwork/monopolypricecontrols</a></li> <li>2. For discussion of the issues involved in regulating for quality, see <i>Frontier Bulletin "Are you being served?"</i> at <a href="http://www.frontier-economics.com/bulletins/en/16.pdf">http://www.frontier-economics.com/bulletins/en/16.pdf</a></li> <li>3. This "reclassification" refers only to regulatory accounts, submitted to OFGEM. The parent company's statutory accounts will be compiled separately and may be unaffected by a change in regulatory reporting.</li> </ol>
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