

Regulatory precedents for setting service quality incentives: financial levels

Report prepared for Royal Mail

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Executive summary

Postcomm acknowledges a link between service quality incentives and allowed profits. However, in its June 2005 Initial Proposals,¹ Postcomm does not explain the link other than to state that its calculation of allowed profit marginally exceeds its estimate of the maximum financial penalty for the failure of service targets. More specifically, Postcomm estimates the proposed maximum exposure for service failure to be equivalent to around 98% of the proposed regulatory profit, which, according to the regulator, is around £285m on average per year.²

Postcomm's June 2005 document provides no economic rationale for the choice of the level of exposure for Royal Mail. In addition, it provides no account of the regulatory precedents for the maximum level of allowed profit exposed for failure of service targets.

This report examines the experience of other regulated industries in the UK, illustrating how regulators have approached the implementation of incentive schemes and the resulting financial exposure for the regulated companies. The sectors covered are electricity distribution, gas distribution, water services, railways, BAA's London airports, air traffic control, and fixed telephony.

Two main conclusions emerge from this report.

- Most of the UK regulators tend to favour a two-sided incentive scheme of penalties and rewards as a way of creating adequate incentives for the companies to achieve service standards. Of all the sectors reviewed in this report, the only example with a one-sided incentive scheme is BAA's London airports. However, the industry regulator expressed no automatic preference for a one-sided scheme, acknowledging the advantages of two-sided incentives. Therefore, Postcomm's one-sided incentive approach appears to be out of line with the regulatory trends in other UK sectors.
- The levels of profit exposure³ of other UK regulated utilities vary considerably, but are typically limited to a mid-range of around 15% of allowed profits, and do not exceed around 40%. In the case of BT, the price control has never included a financial exposure for service quality failure. In the case of the railways, the level of exposure is unlimited, although in the three years to April 2004, the average did not exceed 70% (including the Hatfield derailment). Consequently, the level of financial exposure for service quality failure proposed by Postcomm is not generally supported by regulatory precedent and appears to be out of line with all other UK regulators.

¹ Postcomm (2005), '2006 Royal Mail Price and Service Quality Review, Initial Proposals', June 1st.

² The definition of allowed profits used by Postcomm to arrive at the estimate of £285m is unclear in the Initial Proposals document. Postcomm has stated that the profit allowance will be set as a weighted average cost of capital (WACC) multiplied by Royal Mail's regulatory asset base (RAB). See, for example, Postcomm (2005), op. cit., para A4.5. To arrive at the profit allowance of £285m per year, the regulator has used a pre-tax real cost of capital of 8%, an opening RAB of £2,203 billion, and Postcomm's assumptions on how the RAB should roll forward (see Postcomm 2005, op. cit., para A4.46). However, WACC*RAB does not result in £285m per year. If the allowed profit is measured assuming WACC*RAB = £176m, the profit exposure to service quality incentives would exceed 100%.

³ Profit exposure is defined as the ratio of the maximum level of penalties that a company would have to pay for not achieving the relevant quality standards to the company's allowed profits.

Contents

1	Introduction	1
2	Regulatory precedents	3
2.1	Electricity distribution	3
2.2	Gas distribution	4
2.3	Water services	6
2.4	Railways network	7
2.5	London airports	8
2.6	Air traffic control	9
2.7	Fixed telephony	10
3	Financial exposure to service quality incentives	12
4	One-sided versus two-sided financial incentives	16
5	Conclusions	19

List of tables

Table 3.1	Downside exposure to service performance	13
Table 4.1	Structure of incentive scheme	16

1 Introduction

Setting an adequate level of incentives to improve quality of service is a central aspect of regulatory policy discussions in most of the UK utilities sectors, including postal services.

According to Royal Mail's estimates:

Royal Mail is currently heavily incentivised to improve quality of service with 28 Licence targets and penalty regimes worth up to around £200m pa, in addition to fines and individual compensation payments.⁴

This is slightly less than 60% of Royal Mail's allowed operating profits for 2005/06.⁵

Although Royal Mail's existing price control has a significant service performance scheme in place, as well as recent performance improvements, Postcomm is proposing to further strengthen the service quality incentives. Indeed, in its Initial Proposals, Postcomm states that it is:

concerned that the incentives in the current quality of service regime may not be strong enough. This may be in part due to the degree of financial exposure for performance below standard that Royal Mail is subject to ... but also to how clearly this is specified in advance. Postcomm believes that one of the important lessons to learn from the current regime is the need to give Royal Mail and other stakeholders greater certainty over the likely financial consequences (in terms of compensation, 'C' factor and financial penalties) of its performance outturn in advance of failure. (paragraph 9.21)

The regulator proposes to expand Royal Mail's potential financial exposure to the service quality incentives by increasing the proportion of revenues that would be subject to quality-of-service incentives. In particular, in its Initial Proposals, it:

has estimated the maximum amount of money that Royal Mail would have to pay back to customers via bulk compensation or through the 'C' factor as about £280m. (paragraph 8.133)

The regulator has also stated that when:

setting the cost of capital and the profit level, Postcomm has taken into account the risks inherent to Royal Mail as a result of being exposed to these incentives. (paragraph 9.61)

and that:

The maximum amount of revenue which can be paid out to customers under the two schemes, around £280m, is similar in magnitude to the allowance that Postcomm has made for profit when setting Royal Mail's price control ... Royal Mail's service quality incentives, therefore, can be seen as making the business's ability to earn profits conditional on the achievement of an acceptable level of service. This link between quality of service and regulatory profit reflects a key concern of Postwatch. (paragraph 9.64)

⁴ Royal Mail (2004), '2006 Royal Mail Price and Service Quality Review: Royal Mail's Response', December, para 4.2.

⁵ Postcomm (2003), 'Review of Royal Mail Group plc's Price and Quality Regulation: Final Proposals', February.

Postcomm (and Postwatch) acknowledges a link between service quality incentives and allowed profits. However, in its Initial Proposals, it does not explain the link other than to state that its calculation of allowed profit marginally exceeds its estimate of the maximum financial penalty for the failure of service targets. More specifically, Postcomm's proposed maximum exposure for service failure would be equivalent to around 98% of the proposed regulatory profit, which, according to Postcomm, would be around £285m on average per year.⁶

Postcomm conducts no further analysis in its Initial Proposals to demonstrate that this is an appropriate level of exposure for Royal Mail. In particular, it takes no account of the regulatory precedents for the maximum level of allowed profit exposed to failure of service targets.

This report examines the experience of other regulated industries in the UK, illustrating how regulators have approached the implementation of incentive schemes and the resulting financial exposure for the regulated companies. The sectors covered are electricity distribution, gas distribution, water services, railways, BAA London airports, air traffic control, and fixed telephony.

The report is structured as follows:

- section 2 sets out the regulatory precedents in relation to the level of exposure in each sector. The main measures of financial exposure considered are in terms of allowed profits and allowed revenues;
- section 3 compares the levels of revenue and profit exposure;
- section 4 looks at the structure of service quality incentive schemes. In particular, it reviews whether UK regulators have adopted incentive schemes that involve penalties for underperformance but no rewards for outperforming, or schemes that include both penalties and rewards;
- section 5 concludes.

⁶ The definition of allowed profits used by Postcomm to arrive at the estimate of £285m is unclear in the Initial Proposals document. Postcomm has stated that the profit allowance will be set as a WACC multiplied by Royal Mail's RAB. See, for example, Postcomm (2005), op. cit., para A4.5. To arrive at the profit allowance of £285m per year, the regulator has used a pre-tax real cost of capital of 8%, an opening RAB of £2,203 billion, and Postcomm's assumptions on how the RAB should roll forward. See Postcomm (2005), op. cit., para A4.46. However, $WACC \times RAB$ does not result in £285m per year. If the allowed profit is measured assuming $WACC \times RAB = £176m$, then the profit exposure to service quality incentives would exceed 100%.

2 Regulatory precedents

Several mechanisms for quality regulation are available to regulators to encourage companies to deliver service quality. These include publication of quality performance information, adjusting the price control formula, customer compensation schemes, and minimum service standards (penalties). The incentives created by these approaches vary depending on both the particular characteristics of the industry being regulated and the demand characteristics. The incentives' properties, as well as the main advantages and disadvantages of these different approaches, have been well rehearsed in the literature and are beyond the scope of this report.⁷

This section presents the main aspects of service quality regulation in a number of UK regulated sectors.

2.1 Electricity distribution

Quality of service plays a key role in Ofgem's regulation of the electricity distribution companies. The framework of incentives for the distribution network operators (DNOs) includes adjustments to the price control (Information and Incentives Project, IIP), as well as customer compensation schemes (Guaranteed Standards of Performance).

The IIP was introduced as part of the 1999 price control review, to strengthen the incentives on the DNOs to deliver the agreed quality of output and to value improvements in the quality of output. With that aim, the IIP links the DNO's revenue to the number and duration of interruptions of supply experienced by customers.

Since the introduction of the IIP, the exposure of revenues on the downside and upside has tended to increase through time. Under the recent price control review for 2005–10,⁸ the approach includes the interruption incentive scheme, which consists of symmetric annual rewards and penalties depending on each DNO's performance against its targets on the number and duration of interruptions of supply. The proportion of revenue exposed under this scheme is 3%, which is higher than that of the scheme that existed until March 2005.⁹

DNOs that have been set targets to reduce the number of interruptions are given associated CAPEX allowances based on an assessment of the marginal costs of improvement. Associated CAPEX allowances are not available for DNOs that are required to maintain the current level of interruptions. The total CAPEX allowance for the five-year period is around £112m (2002/03 prices).¹⁰

⁷ See, for example, Rovizzi, L. and Thompson, D. (1995), 'The Regulation of Product Quality in the Public Utilities', in J. Kay and C.P. Mayer (eds), *The Regulatory Challenge*, Oxford: Oxford University Press; and Sappington, D. (2005), 'Regulating Service Quality: A Survey', *Journal of Regulatory Economics*, 27:2, 123–54.

⁸ Ofgem (2004), 'Electricity Distribution Price Control Review: Final Proposals', 265/04, November.

⁹ Ofgem considered that the results of a customer survey pointed towards a degree of willingness to pay, which could be reflected in stronger incentives. See Ofgem (2004), 'Electricity Distribution Price Control Review: Impact Assessment', 265b/04, November.

¹⁰ In addition, Ofgem included a cost allowance for improvements in restoration times, which is based on a specified amount per fault (£330) multiplied by the weighted number of faults. The total restoration cost for the five-year period is around £113m (2002/03 prices). The restoration cost allowance used to fund CAPEX is included as part of the CAPEX incentive mechanism.

Limitations to the downside apply in the case of severe weather events, as these are fully excluded from the incentive scheme.¹¹ Furthermore, adjustments to performance are considered for events that are beyond the DNOs' control, such as transmission faults and third-party damage. The regulator has established thresholds for exceptionality for the number and duration of interruptions, based on the number of customers affected and minutes lost.¹² Any values above these thresholds are removed from the annual quality-of-service incentive scheme, provided the DNO can show it has taken all reasonable steps to prevent the event and mitigate the impact.

In addition to the interruption incentive scheme, there are incentives related to Guaranteed Standards of Performance,¹³ which set minimum service levels related to restoration of the services that must be met in each individual case. If a DNO fails to deliver the required service level, it must pay a fixed level of compensation to the affected consumer of between £20 and £100 depending on the standard and type of customer. Under normal weather conditions, the level of compensation is uncapped, but in the case of severe weather conditions it is capped at 2% of price control revenues. The majority of compensation payments under Guaranteed Standards are triggered automatically; however, for three standards,¹⁴ the customer needs to claim in order to receive a payment.

The DNOs' incentive scheme includes financial incentives on the operators' telephony performance, which is based on the results of an ongoing customer survey. DNOs are subject to sliding-scale penalties if their annual mean performance falls below a certain level. The full penalty for poor customer satisfaction is 0.25% of revenue. A small reward, equivalent to 0.05% of revenue, applies for DNOs that exceed a certain level of customer satisfaction.¹⁵

Overall, the revenue exposure of DNOs to quality of service (excluding other standards of performance) is capped to 4% of revenues on the downside.¹⁶

2.2 Gas distribution

The incentives for improving service quality on the distribution networks (DNs) were introduced as part of Transco's price control from 2002.¹⁷ The price control initially applied to all Transco's local distribution zones (LDZs) in aggregate, but was subsequently separated by DN from April 2004.¹⁸

The separate DN price controls establish revenue caps aimed at encouraging overall cost efficiency and efficient investment. The price control for the aggregate LDZs included

¹¹ Ofgem is providing an annual cost allowance for exceptional events to cover an efficient level of compensation payments and fault costs related to severe weather events, with the aim of strengthening the DNOs' incentives to restore customer supply promptly. These annual allowances could be used to reduce the probability of such events occurring, to manage the impact of the events through more rapid customer restoration, or to buy storm insurance cover.

¹² See Ofgem (2004), op. cit., Table 4.9.

¹³ The Overall Standards of Performance, which covered areas where it was considered inappropriate to have individual guarantees, were revoked as part of the 2005–10 price control review. See, Ofgem (2004), op cit, para 4.50.

¹⁴ Restoration of supply following a fault (GS2), multiple interruption (GS 2A), and notice of planned interruption to supply (GS4). See Ofgem (2005), 'Revised Standards of Performance Arrangements for Electricity Distributors: Consultation on the Draft Statutory Instrument for Guaranteed Standards and Revocation of the Overall Standards of Performance', 03/05, January.

¹⁵ A distinction is made for telephony incentives in storm conditions. No revenues will be exposed in the first two years of the scheme, as target levels need to be established. After that period, Ofgem envisages penalties and rewards of 0.25% of revenue.

¹⁶ See Ofgem (2004), op. cit., Table 4.1.

¹⁷ Ofgem (2001), 'Review of Transco's Price Control from 2002: Final Proposals', September. The price control also covers the Transco's activities related to the National Transmission System (NTS) as well as metering and meter reading. These activities are not addressed in this report.

¹⁸ Ofgem (2003), 'Separation of Transco's Distribution Price Control: Final Proposals', June.

proposals for an incentive scheme linking Transco's LDZ revenue to the number and duration of non-contractual supply interruptions, along the same lines of Ofgem's IIP for electricity distribution. Under the proposals, the maximum revenue exposed under the scheme would be $\pm 2\%$ of Transco's LDZ revenue. The scheme was initially scheduled to be introduced in April 2004, and was later postponed until April 2005, following the separation of Transco's distribution price control. However, this scheme is still not in place.¹⁹

As part of Transco's quality of service arrangements, Ofgem introduced:

- Guaranteed and Overall Standards of Performance, which set minimum levels of service that gas transporters are expected to achieve for individual consumers and consumers as a whole;²⁰ and
- output reporting and incentives.

The Guaranteed Standards of Performance establish service levels that must be met in each individual case.²¹ If a gas transporter fails to meet the specified standard, it is obliged to pay a fixed level of compensation to the affected customers, ranging from £20 to £100 depending on the type of customer and the standard.²²

Overall Standards of Performance are applicable to customers connected to Transco's distribution networks and those connected to independent gas transport's networks. They include areas where the regulator considers customers in general have a right to expect licensees to deliver pre-set minimum levels of service, but in areas where it would not be necessarily appropriate to put in place guarantees for individual customers, such as performance related to telephone calls to the national emergency number, customer complaints handling, and informing customers when they are due to be reconnected following unplanned supply interruptions.²³ Overall standards do not entail obligations for gas transporters to make compensation payments if they fail to meet the target (although failure to do so may lead to Ofgem taking enforcement action).²⁴

There are also service standard obligations in Transco's Network Code covering supply restoration for non-domestic consumers, as well as resolving industrial and commercial consumers' queries. Where performance falls below planned levels, Transco is required to make liability payments to the affected parties.

In addition to the standards of performance, Transco is subject to an output reporting framework under which it is required to report performance on key service quality indicators, including the number and duration of interruptions, as well as environmental outputs and performance under the mains replacement programme.²⁵

¹⁹ According to Ofgem, this is due to a number of reasons, including technical difficulties with regard to data reliability and with the relatively low number of interruptions with respect to electricity distribution.

²⁰ The separation of Transco's distribution price control did not affect the Guaranteed and Overall Standards of Performance, as these already applied to each regional network. See, Ofgem (2003), 'Separation of Transco's Distribution Price Control: Final Proposals', June.

²¹ The Guaranteed Standards include restoring the supply of domestic consumers after an unplanned interruption, reinstatement of consumer's premises, making and keeping appointments, provision of adequate heating and cooking facilities in case of supply interruptions, and notifying consumers of payments owed under the standards. New Guaranteed Standards were added in May 2005 in respect of performance in the connections market.

²² For example, the compensation for failing to restore domestic consumers' supplies within 24 hours is £30. There is a further payment of £30 for each additional 24 hours, and the total compensation is capped at £1,000 per customer per incident.

²³ See, for example, Ofgem (2005), 'Revised Overall Standards of Performance Arrangements for Gas Transporters: Consultation on the Draft Determinations', March.

²⁴ Ofgem can impose a financial penalty of up to 10% of a licensee's turnover if the licensee has breached a licence condition.

²⁵ See, Ofgem (2005), 'Gas Distribution Quality of Service Regulatory Instructions and Guidance: Version 3', March.

2.3 Water services

Ofwat's quality-of-service incentive regulation comprises a series of approaches, including:

- Overall Performance Assessment (OPA), whereby comparative assessment of overall performance translates into financial adjustments to the price limits at the next periodic review;
- level-of-service indicators, published annually by Ofwat. Regulatory action is taken against poorly performing companies;
- the Guaranteed Standards Scheme (GSS)—a compensation scheme dealing with customer-specific complaints.

2.3.1 The Overall Performance Assessment

Introduced in the lead-up to the 1999 review, the OPA scheme is a comparative assessment that identifies both the companies at the frontier and those that fared less well in overall performance. The OPA aims to provide an incentive to companies to maintain services and, if necessary, improve them, since it links service standards to the prices that companies are allowed to charge.

According to Ofwat, the assessment serves two purposes: it enables the regulator to compare the quality of the overall service provided by companies to customers; and to inform customers and other stakeholders about the overall performance of their local water company.²⁶

Price limits are adjusted only for those companies whose performance was clearly better or worse than that of other companies. Unlike other regulated sectors where service performance is financially penalised or rewarded within the price control period, the OPA translates into one-off financial adjustments to the price limits at the *next* periodic review. For example, for the 2005–10 price control review, the adjustments were based on companies' OPA performance in the years 2002/03 and 2003/04.

The one-off adjustment is applied to the first year of the price limits after all other decisions on price limits are made. The range of adjustments is between +0.5% of revenues for the best-performing companies and –1% for companies whose performance is significantly worse than the industry average.

2.3.2 Other service performance incentives

In addition to the OPA, water companies are subject to the following performance incentives.

- **Level-of-service indicators**—each year, the companies provide Ofwat with information on their performance against various aspects of service. On the basis of this information, the regulator publishes an annual level-of-service report that reviews companies' performance in delivering customer service and in providing water supply and sewerage services. Assessment of performance is conducted on a comparative basis (ie, it is assessed against the industry average), or on an absolute basis, depending on the indicators. Ofwat's assessment of the quality of individual services is based on three bands:
 - *good, acceptable, and needs improvement* (absolute assessment); or
 - *above average, average and below average* (comparative assessment).

²⁶ See, for example, Ofwat (2004), 'Updating the Overall Performance Assessment (OPA): Conclusions and Methodology for 2004–05 Onwards', March.

Regulatory action may be taken against those companies assessed as *needs improvement* or *below average*. Poorly performing companies are required to provide an explanation for their performance in that particular year, and to present robust plans to improve both their absolute and relative performance.

- **Guaranteed Standards Scheme (GSS)**—this scheme was introduced in 1989 to set minimum standards of service for all customers of the regulated water and sewage companies in England and Wales. Under the GSS, if a company fails to meet any of the guaranteed standards, customers (domestic and business) are entitled to a compensation payment.²⁷ In addition, for several of the standards where customers previously had to claim compensation payments, companies are now obliged to make automatic payments.²⁸ Although these compensation payments are uncapped, there are some limits that are related to exceptions to the scheme that may arise as a result of circumstances beyond the company's control (ie, unforeseen events, industrial action or severe weather conditions).

2.4 Railways network

A quality incentive regulation scheme is included as part of Network Rail's regulation of track access charges to train operating companies (TOCs). The most important instrument is the performance regime contained in Schedule 8 of franchised passenger TOCs' track access agreements with Network Rail.

In addition, the incentive regime includes compensation to TOCs when Network Rail takes possession of parts of the network for engineering work (Schedule 4), as well as volume and asset stewardship incentives.

2.4.1 Performance regime (Schedule 8)

Schedule 8 of track access contracts aims to incentivise Network Rail and TOCs to maintain and improve operational performance. In particular, it is designed to compensate TOCs for the revenue effects of changes in infrastructure performance, measured by average lateness at certain monitoring points on the network. Compensation is paid by Network Rail to the TOC affected by average lateness above a benchmark level (based on recent performance) that is attributable to infrastructure-related issues in any one four-week period.²⁹ Below the benchmark level of average lateness attributable to Network Rail in a four-week period, the TOC pays Network Rail.³⁰

In both cases, the difference between actual lateness minutes and the benchmark is multiplied by a marginal revenue effect (MRE) parameter, which represents the revenue effect of one minute of additional lateness for the service group in question, and the 'busyness' factor, which represents the average number of trains stopping at each monitoring point in any one period.³¹

²⁷ In 1999, following a consultation, Ofwat undertook a major review of the GSS operation, and a revised scheme came into effect in 2000. The new scheme increased payment levels from £10 to £20 for domestic customers, and from £20 to £50 for business customers.

²⁸ Low pressure is the only standard that requires the customer to claim a compensation payment.

²⁹ Average lateness represents the average number of minutes that passengers arrive at their destinations later than the advertised arrival time. Trains that do not run or miss out a monitoring point are given a lateness value based on the length of time that the passenger would normally have to wait for the next train.

³⁰ Examples of delays caused by Network Rail include those arising from point failure, track circuit failure, signaling failure, and electrification equipment failure.

³¹ ORR (2004), 'Review of Schedule 8 Performance Regime', November.

Since the penalties or bonuses depend on the level of fare revenue gained or lost as a result of poor performance, Network Rail's financial exposure for quality underperformance is in principle uncapped. However, as shown in section 3, even if the theoretical maximum level of penalties is uncapped, the exposure of the network operator in a 'worst-case scenario', such as the Hatfield derailment, is significantly below the 100% of its profits.

More recently, however, there have been some suggestions that the bonus payments to Network Rail should be capped if, for example, capacity constraints and the regulation of fares mean that farebox revenues would not increase with improvements in performance. Indeed, as part of the ongoing review of the Schedule 8 performance regime—which is aimed at strengthening its effectiveness—some stakeholders have claimed that, in circumstances where revenue can be unresponsive to improvements in performance (eg, as a result of capacity constraints, or high levels of performance), the level of bonus payment should be limited through a cap, for example. This view has been rejected by Network Rail and the TOCs, however, as they consider that TOCs and end-customers generally desire higher-than-benchmark performance and want Network Rail to be incentivised to achieve this.³²

2.4.2 Other financial incentives

As mentioned above, in addition to the Schedule 8 regime, the network operator is subject to other financial incentives, including the following.

- **Schedule 4**—this mechanism compensates passenger train operators for the lost revenue associated with restrictions of use, using the same MRE parameters as Schedule 8. The ORR is currently reviewing the extent to which Schedule 4 is fit for purpose as an incentive and compensation regime.³³
- **Volume incentive**—this is an input-based incentive (ie, it targets the state of companies' assets and their investment in quality-enhancement schemes). The aim is to encourage Network Rail to promote the use and development of its network. In particular, it will provide the network operator with additional revenues through an adjustment to the RAB following the 2009 access charge review, depending on the growth in actual passenger train miles, in farebox revenue, and in freight train miles and gross tonne miles.
- **Asset stewardship incentive**—the aim of this scheme is to create an incentive for Network Rail to deliver ongoing improvements to the underlying condition and serviceability of the network. The ORR introduced an asset stewardship index that measures the improvement in a basket of asset stewardship indicators and considers adjustments to the RAB at the next access charge review to the extent to which a weighted average of the indicators had improved during the control period. The rewards are capped to a maximum of £300m.³⁴

2.5 London airports

Service quality regulation of the London airports takes the form of a compensation scheme, 'Standards and Rebates', which provides rebates when set standards are not met.

³² ORR (2005), 'Review of the Schedule 8 Performance Regime: Draft Conclusions', June 15th.

³³ ORR (2005), 'The Possessions Review: Initial Consultation Document', March 24th.

³⁴ ORR (2003), 'Access Charges Review 2003: Final Conclusions', December, Chapters 17 and 19.

As part of the most recent price control review of BAA, a Competition Commission inquiry found that charges at Heathrow and Gatwick Airports did not sufficiently reflect differences in quality of service.³⁵ During the inquiry, the Commission considered alternative incentive schemes, including a Q factor in the charge cap formula, which was favoured by the CAA, and a rebates scheme. As a remedy, the Commission recommended that these airports should pay rebates to airlines whenever their quality failed to achieve standards set by the CAA.

The Commission recommended that these rebates should be paid on a terminal-by-terminal basis, and distributed among the airlines on the basis of passenger share. Furthermore, it considered that, initially, there should be a limit to the maximum rebates equivalent to 2% of the airport charges, given that this was 'a new, untried approach'.³⁶ A similar argument was adopted by the CAA in the regulation of NATS.

In March 2003, the CAA decided to implement the Competition Commission's recommendations by imposing a condition on these airports' permission to levy charges, which requires them to abide by the scheme of Standards and Rebates that came into effect in July 2003.³⁷

The scheme includes two components: an airline rebate, based on objective measures of services provided to airlines; and a passenger rebate, based on passenger perception of services in areas that affect the service provided to them. In line with the Competition Commission recommendation, the CAA established a limit to the level of airline and passenger rebates. In particular, it decided that the scale of rebates in total for the *airline* component would be no more than 1.5% of charges for the first two years, and 2.5% thereafter.

With regard to the *passenger* rebate element, the CAA established a total maximum of 0.5% of charges revenue. Therefore, the maximum level of rebate for all the elements in the scheme overall is 2% of charge revenues in the first two years, and 3% thereafter.³⁸ In addition, there are limitations to the scheme set by a restricted deadband of one month for certain facilities that require periodic maintenance, during which time the airport is not subject to a rebate.

2.6 Air traffic control

In regulating NATS' service quality, the CAA adopted a different approach to the incentive schemes used in the case of BAA London airports. Rather than focusing on a customer compensation scheme, NATS' service quality regulatory approach is based on a service quality factor that is added to the price control formula (the 'delay term'), thereby introducing adjustments in the revenues that NATS is allowed to earn.

When the scheme was devised in 2000, the CAA considered that the value of the delay term would have a relatively modest impact during the first price control period, given that it was an untried approach and was based on measurement systems that were not set up for this

³⁵ Competition Commission (2002), 'BAA plc: A Report on the Economic Regulation of the London Airport Companies (Heathrow Airport Ltd, Gatwick Airport Ltd and Stansted Airport Ltd)', November.

³⁶ Ibid., para 2.465.

³⁷ See CAA (2003), 'Economic Regulation of BAA London Airports (Heathrow, Gatwick and Stansted) 2003–2008', CAA Decision, February; and CAA (2003), 'Economic Regulation of Heathrow and Gatwick London Airports: Service Quality: Statement of Standards and Rebates', May.

³⁸ CAA (2003), 'Economic Regulation of Heathrow and Gatwick London Airports: Service Quality: Statement of Standards and Rebates', May.

purpose. The parameters were set such that the maximum penalty in any one year, based on the forecast traffic, would not exceed specified maximum levels.³⁹

This led to a maximum revenue exposure of £5.7m per year, equivalent to 1.3% of NATS' revenues. However, in making its decision, the government reduced the maximum annual penalty in respect of delays in 2001 and 2002 to £2m.

Following a significant deterioration in NATS' En Route service performance (in terms of delay per flight) during 2001 and 2002, the CAA explored ways to strengthen NATS' incentives to improve its performance.⁴⁰ As a result, from January 1st 2003 until December 31st 2005, the maximum penalty increased to a level consistent with around £10m per year.⁴¹

As part of the 2006–10 price control review, the CAA is proposing to further strengthen NATS' financial incentives, following an assessment of the current delay mechanism. In particular, the CAA's recent firm proposals include increasing the rates of penalties and rewards of the delay term by around 2.4 times the current penalty rate, and 5.3 times the current reward rate. In addition, it proposes to reduce the par value, and to increase the maximum penalty for delays to an expected level of £24m, equivalent to around 5% of allowed revenues.⁴²

2.7 Fixed telephony

Of all the regulated sectors considered in this report, telecoms is the only one that is not subject to financial regulatory incentives to improve service quality in the price control, apart from a customer compensation scheme. Quality-of-service regulation in the sector has mainly taken the form of the publication of performance indicators.

Several price control reviews considered whether the price control formula should be adjusted to account for service performance. However, Oftel considered that the approach of linking quality with prices would be complicated and there would be problems in setting the appropriate penalty associated with missing the targets. Furthermore, the regulator believed that where the costs of achieving the targets were greater than the associated penalties, there might be a danger that the targets would be ignored. Above all, it was unclear to the regulator that the approach would be necessary since the 'schemes for compensating customers who suffer poor service have the clear advantage over schemes to adjust price caps on the basis of quality of services in that they target those who have suffered poor services'.⁴³ The regulator opted for not linking price caps and quality of service.

Publication of performance information takes the form of two schemes.

- **Comparable performance indicators (CPIs)**—an industry-wide initiative launched by Oftel in 1993 with the intention of addressing the absence of comparable information about the quality of telecoms operators, information that the regulator 'believed necessary for consumers to make informed choices and in so doing to stimulate competition'.⁴⁴ Under this initiative, the industry was asked to agree on a set of service quality indicators covering several aspects of services that were of concern to residential

³⁹ The maximum annual penalty would rise to £5.7m in respect of delays occurring from 2003. See DfT (2001), 'National Air Traffic Services: Government Response to Select Committee Report', June 13th.

⁴⁰ CAA (2003), 'Proposed Options to Modify the Effect of Delay on the Eurocontrol Charge', Consultation Document, March.

⁴¹ CAA (2003), 'Decision under Section 11 of the Transport Act 2000: NATS (En Route) Limited: Modification of the Effect of Delay on the Eurocontrol Charges Control', June 12th.

⁴² CAA (2005), 'NATS Price Control Review 2006–2010: CAA's Firm Proposals', May.

⁴³ Oftel (1992), 'The Regulation of BT's Prices: A Consultative Document', January.

⁴⁴ Ibid.

and business customers. The scheme was originally conceived as voluntary, but following a consultation process during 2003, Ofcom opted for mandating the provision of comparable performance information to end-users for fixed-line service providers of a certain size.⁴⁵ The scheme does not directly involve financial incentives to improve performance since no targets have been defined: its purpose is purely informative.

- **Key performance indicators (KPIs)**—unlike the industry-wide CPI initiative, the KPIs apply only to operators that have been found to have significant market power (SMP) in the relevant market.⁴⁶ BT has been found to have SMP in a number of markets; as a result, Ofcom has proposed that BT be required to publish high-level information in relation to the quality of service it delivers in providing certain wholesale services.

With regard to the customer compensation scheme, BT's Customer Service Guarantee offers as compensation for delays in installing a service or in fault repairs either diversion of calls to another fixed or mobile number free of charge, or a fixed-rate compensation that varies according to the length of delay, up to the equivalent of four months' line rental for ten or more days of delay. Customers are also entitled to claim for financial loss of up to £1,000 per residential line. Compensation payments need to be claimed by the customers.

⁴⁵ The threshold has been set at £4m in net revenues per quarter and 100m call minutes handled to end-users per quarter. Ofcom (2004), 'A Statement on Providing Quality of Service Information to Consumers', September 1st.

⁴⁶ Under the new electronic communications EU Directives, national regulatory authorities should undertake reviews of competition in different markets to ensure that regulation remains appropriate given the changing market conditions. If there were no operator with SMP, the regulator should withdraw all ex ante regulatory controls from that market. If an SMP operator were found, ex ante controls would be required.

3 Financial exposure to service quality incentives

Taking into account the regulatory approaches examined above, this section focuses on the level of financial exposure faced by the regulated companies. In particular, it looks at the maximum level of penalties that a company would have to pay for not achieving the relevant quality standards. Financial exposure is defined as a percentage of total allowed revenues, and as a percentage of total allowed profits.

The section does not, however, examine the financial rewards that would result from companies outperforming the quality standards. This is because the aim of this section is to assess the extent to which the level of penalties under a 'worst-case' scenario affect the profitability of the regulated company.

Table 3.1 presents the level of revenue and profit exposures for the first year of the control period of the sectors examined in section 2. The figures in this table present the exposure related to the schemes that involve revenue adjustments as a result of quality-of-service underperformance (ie, price control service terms, and rebates to customers that are not end-users), and, where relevant, the additional exposure that results from automatic compensation payments to end-users. Given that in most of the relevant cases the level of compensation is not capped and would depend on the number of customers compensated in a given year, this additional exposure presented in the table is only an approximation based on past compensation payments, and may not necessarily represent the total level of exposure as a result of these payments.

Table 3.1 Downside exposure to service performance

Sector	Year	Allowed revenue (£m)	Allowed profits (£m)	Maximum penalties (excl. compensation payments) (£)	Revenue exposure (excluding compensation) (%)	Profit exposure (excluding compensation) (%)	Profit exposure (including compensation) (%)
Electricity distribution (2005–10) ¹	2005	2,998	861	120	4	13.9	14.2
Gas distribution (2002–07) ²	2002	1,990	570	0	0	0	0.3
BAA London airports (2003–08) ³	2003	618	469	12	2	2.6	n/a
Water (2005–10) ⁴	Five-year period	36,548	11,001	366	1	3.3	3.4
NATS (2000–05) ⁵	2003	448	68	10	2.2	14.7	n/a
NATS (2006–10) ⁶	2006	448	57	24	5.4	42.1	n/a
Network Rail (2004–09)	All control period			Uncapped	Uncapped	Uncapped	n/a
BT	All control period			n/a	n/a	n/a	n/a

Note: ¹ Aggregation of all electricity distribution companies. Allowed profits based on pre-tax WACC of 6.9% and an average of opening and closing aggregated RAB (2002/03 prices); direct compensation payments are based on a conservative estimate of past payments.

² Figures correspond to Transco's LDZs. Allowed revenues correspond to regional network price-controlled revenue (2000 prices); allowed profits based on regulatory asset value of around £9.4 billion and WACC of 6.25%; estimated compensation payments correspond to Transco's 2003/04 payments under the Guaranteed Standards of Performance.

³ Allowed revenue figures correspond to the aggregate of 'total regulated revenue requirement' of the three BAA London airports (2000/01 prices); allowed profits correspond to 'aggregated required return on RAB'.

⁴ Figures correspond to the five-year aggregate of all water and sewerage companies; allowed revenues refer to aggregate revenues before OPA; allowed profits correspond to return on capital (including financeability); direct compensation payments based on average of total payments of £3m over the period 2001/02–2003/04.

⁵ Figures refer to mid-control period. Allowed revenues correspond to required revenues for 2003. Allowed profits correspond to allowed return on RAB (in 2003 prices), as defined in CAA (2002), 'NATS' Application to Re-open the Eurocontrol Charge Control', Consultation on CAA's Preliminary Conclusions, May.

⁶ Allowed revenues in 2003/04 prices; allowed profits based on pre-tax WACC of 6.75% (adjusted to 6.53%) and the average of opening and closing RAB.

Source: Oxera calculations based on regulators' final determination documents and service performance reports.

The levels of revenue and profit exposure vary significantly across the regulated companies considered in this report. Starting with electricity distribution, DNOs' exposure, as a result of the IIP, is capped at 4% of allowed revenues on the downside (excluding other standards of performance). Taking into account aggregated allowed revenue for the 14 DNOs of around £3 billion for 2004/05, the maximum penalties could represent up to £120m on aggregate in the first year. Given aggregated allowed profits of £860m (calculated as RAB x WACC), the resulting average maximum profit exposure on the downside is around 14%, with a range of 13% and 14.5% for individual DNOs. The overall amount of automatic compensation payments to customers is not capped, although these payments have historically been relatively low. Past compensation payments were used to obtain a better understanding of the additional profit exposure as a result of automatic compensation payments. Based on payments made over the period 1996/97–2000/01 (the last publicly available figures), the additional profit exposure would be around 0.3 percentage points.⁴⁷

Unlike electricity distribution, gas distribution has not been subject to revenue adjustments as a result of quality-of-service underperformance. Transco's distribution business is only required to make compensation payments under the Guaranteed Standards of Performance (and under the Network Code). Payments made by Transco under this scheme were around £1.8m in 2003/04.⁴⁸ If total automatic compensation payments were of this order of magnitude, the profit exposure would be less than 1%.

In the case of BAA London airports, payments under the Standards and Rebates scheme are limited to 2% of revenues in the first two years of the control and 3% thereafter. The table shows the financial exposure for 2003/04, the first year of the control. The resulting maximum rebates for the three airports would amount to around £12m, which is on average equivalent to less than 3% of the aggregated required return on RAB.

With regard to the financial exposure of the water and sewerage companies, the maximum penalties as part of the OPA scheme are set at 1% of allowed revenues. This is the lowest revenue exposure of the regulatory precedents addressed in this report, with the exception of BT, whose regulatory revenues are not subject to service performance-related financial incentives. The figures reported in the table correspond to the five-year aggregate of all the water and sewerage companies in England and Wales.⁴⁹ These maximum penalties (excluding customer compensation payments) would be equivalent, on average, to 3.3% of the aggregated return on capital, with a range between 3% and 3.7% for individual water and sewerage companies. Customer compensation payments are not capped. To obtain a better understanding of the additional profit exposure as a result of automatic compensation payments, an average of past compensation payments made by the water and sewerage companies was also considered. Over the period 2001/02–2003/04, the companies paid a total of around £3m per year in customer compensation. Based on this past average compensation payment, the profit exposure of the companies would only increase marginally, from 3.3% to 3.4%.

NATS, on the other hand, presents one of the highest levels of financial exposure to the service quality incentives of the schemes considered in this report. Under the existing control, the level of exposure created by the 'delay term' increased halfway through the control period to a maximum penalty of £10m per year. Given a return on RAB of around £68m, the resulting profit exposure is around 15%. This level of exposure is expected to increase even further during the 2006–10 price control. In particular, taking into account allowed revenues of about £448m for the first year of the next control, and a maximum

⁴⁷ This is based on estimated total automatic compensation payments of £2m per year, which is likely to be conservative. Over the period 1996/97–2000/01, the accumulated amount of total payments was around £2.6m (in 2003 prices).

⁴⁸ Service quality-related payments under the Network Code were not available.

⁴⁹ Ofwat only published the aggregated five-year data. Disaggregated yearly data is not available.

penalty of £24m per year, the revenue exposure would represent around 5.4% in the first year of the control. Considering allowed profits of around £57m for the first year, the profit exposure of NATS to service quality incentives could increase to around 42%.

Assessing the financial exposure of Network Rail is more difficult since, in principle, there is no cap on the network operator's exposure under the performance regime. However, one way in which the situation of Network Rail (or previously Railtrack) could be compared with the other regulatory precedents is to consider what the actual profit exposure was when the level of performance in the rail industry fell to arguably its lowest point—just after the Hatfield derailment.

As a result of the Hatfield derailment, and the speed restrictions imposed thereafter, both the network operator and TOCs' performance levels fell, resulting in significant payments being made under the Schedule 8 scheme.⁵⁰ Indeed, during the period 2001/02 to 2003/04, Railtrack/Network Rail made total net payments under the performance incentives of around £1 billion, which on aggregate represented around 13% of the network operator's revenue requirements, and 68% of the aggregated return on RAB.⁵¹

⁵⁰ See, for example, ORR (2002), 'The Interim Review of Track Access Charges: Initial Consultation Paper', November.

⁵¹ Improvements in performance for 2004/05 resulted in net payments to Network Rail, equivalent to 2% of annual requirements and 7.5% of the return on RAB. See Network Rail (2005), 'Annual Report and Accounts 2005'.

4 One-sided versus two-sided financial incentives

A key element in designing an incentive regime is determining the structure of incentive payments made to, or by, the company—ie, whether the structure of incentives is one- or two-sided.

Two-sided incentive regimes include penalties for underperforming and rewards if the regulated company outperforms. A one-sided regime only involves penalties for underperforming; no additional revenues are made available if the company exceeds the targets. Within the two-sided schemes it is important to distinguish between symmetric regimes, where the levels of penalties and rewards are the same (eg, 1% of revenues on the upside and downside), and asymmetric regimes, where the levels differ (eg, -1% of revenues for underperforming and +0.5% of revenues for exceeding the targets).

This distinction is relevant as the two types of regime generate different incentives on the performance of the regulated company. Under a one-sided regime, once a benchmark has been met, the regulated company has no further incentive to improve performance; under a two-sided regime, incentives to improve performance will be present at all levels of performance.

Table 4.1 presents the structure of incentive schemes for the utility sectors addressed in section 2. The second column in the table indicates whether the regulated companies have been subject to penalties for underperforming without rewards for outperforming (ie, one-sided incentives), or both penalties and rewards (ie, two-sided incentives). The third column indicates whether, in the case of two-sided schemes, the levels of penalties and rewards are equal.

Table 4.1 Structure of incentive scheme

Sector	One- or two-sided incentives?	Symmetric or asymmetric exposure?
Electricity distribution (2005–10)	Two-sided	Interruption Incentive Scheme: penalties = rewards Overall: penalties capped; no overall cap on rewards
Gas distribution (2002–2007) ¹	Not applicable	
BAA London airports (2003–08)	One-sided	
Water (2005–10)	Two-sided	Penalties > rewards
NATS (2000–05)	Two-sided	Penalties > rewards
NATS (2006–10)	Two-sided	Penalties = rewards
Network Rail (2004–09)	Two-sided	Depends on Network Rail's and TOCs' revenue effects
BT	Not applicable	

Note: ¹ Although not currently in place, Ofgem's proposals included a symmetric two-sided incentive scheme. Source: Oxera based on regulators' final determination documents.

From the table it emerges that, with the exception of BAA London airports' control, all the regulators considered in this report have adopted a two-sided incentive scheme. In particular, as mentioned in section 2, electricity distribution companies are subject to a two-sided scheme of penalties and rewards. Furthermore, as part of the IIP, the Interruption Incentive Scheme includes a symmetric level of revenue exposure on the downside and upside. Overall, DNOs' revenue exposure is capped on the downside, but uncapped on the upside.

Gas distribution is currently not subject to an incentive scheme (apart from compensation payments to customers). However, as part of the 2001 proposals, Ofgem proposed a symmetric two-sided scheme, basing its justification for this on the findings of a consumer research study that suggested that, in aggregate, consumers would be willing to pay for significant improvements in performance on interruptions.⁵²

The regulation of BAA's London airports is the only precedent considered in this report that is subject to a one-sided incentive scheme. During its 2002 inquiry,⁵³ the Competition Commission recommended that these airports should pay rebates to airlines whenever their quality failed to achieve standards set by the CAA. The Commission envisaged the scheme as one-sided—ie, BAA would not be rewarded when the airport's performance exceeds the benchmark. This approach was considered as addressing the Commission's central concern of lower prices in the event of poor services.⁵⁴ The CAA adopted the Commission's recommendation of a 'rebate only' scheme. However, it is important to understand the context of the CAA's decision. The regulator noted that:

The CAA does not have an automatic preference for rebate only approaches to quality issues. It adopted a rebate only system in the particular circumstances of the Heathrow and Gatwick airport review but it recognised in its proposals that there were arguments pulling in opposite directions. The argument for a rebate only approach was that it more closely approximated to a normal commercial contract and provided a better baseline from which to contract for different levels of quality. The argument against was that a rebate only system only provides an incentive not to perform below some specified target. It provides no reward for achieving standards above the target and hence provides no spur to do so.⁵⁵

Water companies are subject to a two-sided scheme of penalties and rewards, although the maximum level of penalties for performing significantly worse than the industry average is higher than the rewards for the best-performing companies. When the OPA was reviewed in 2002, Ofwat considered that the asymmetry of the range was justified by consumer survey evidence, which suggested that, by increasing the positive adjustments to strengthen the incentive to improve services, there would be a risk of going beyond what customers wish to pay for.⁵⁶

The existing NATS' control also includes a two-sided scheme. When the control was established in 2000, the CAA considered that the delay term should be symmetric such that the condition would allow NATS' charges to be higher when performance exceeds the par value, as well as requiring them to be lower when performance is lower than par. Following a significant deterioration in NATS' En Route service performance in terms of delay per flight during 2001 and 2002, the CAA explored ways to strengthen NATS' incentives to improve its performance.⁵⁷ The regulator decided to increase the financial penalties, but the level of bonuses for delays below the par value remained unchanged. Therefore, this has eliminated the symmetry of the original service term. As part of the 2006–10 price control, the CAA is proposing to strengthen the incentives further. However, under the proposed changes the

⁵² Ofgem (2001), 'Review of Transco's Price Control from 2002: Final Proposals', September, paragraph 3.36.

⁵³ Competition Commission (2002), 'BAA plc: A Report on the Economic Regulation of the London Airport Companies (Heathrow Airport Ltd, Gatwick Airport Ltd and Stansted Airport Ltd)', November.

⁵⁴ The potential advantage of a symmetric approach was discussed by the Commission in the context of comparing the preferred rebates scheme and a Q factor in the charge cap formula. The Commission acknowledged the potential advantage of a two-sided approach, but considered that 'if targets were to be set below current or expected performances, this could itself require an overall increase in payments from airlines to BAA, without any improvement in quality of service, and thereby reduce the incentive on BAA to improve performance which falls short of standard'. Ibid., paragraph 2.460.

⁵⁵ CAA (2003), 'Decision under Section 11 of the Transport Act 2000: NATS (En Route) Limited: Modification of the Effect of Delay on the Eurocontrol Charges Control', June 12th, paragraph 20.

⁵⁶ Ofwat (2002), 'Linking Service Levels to Prices', February, page 10.

⁵⁷ CAA (2003), 'Proposed Options to Modify the Effect of Delay on the Eurocontrol Charge', consultation document, March.

symmetry of the delay term would be re-established by adopting a delay term with the same level of penalties and bonuses around a par value, at which neither a penalty or bonus would apply. The scale of the incentive has been calibrated to reflect an estimate of the underlying marginal cost of providing sufficient additional capacity to improve performance at the par value.

The incentive scheme of Network Rail also adopts a two-sided approach, whereby the network operator compensates TOCs for the revenue affected as a result of poor performance, and receives bonus payments from the TOCs in the event of outperformance. The approach is likely to result in asymmetric payments, as the level of bonus and penalty payments depends on the level of farebox revenue gained or lost as a result of poor performance.

Overall, the regulatory precedents show that all the UK regulators considered in this report have acknowledged the incentive properties of an approach that incorporates rewards as well as penalties. Furthermore, after taking into account the specific characteristics of the industry (eg, including results from surveys on consumer's willingness to pay for quality improvements), most of the regulators have opted for two-sided incentive schemes.

5 Conclusions

Implementing quality-of-service regulation may entail potential complications that do not necessarily arise in price regulation. In setting an adequate level of service quality incentives, any regulator may need to make a judgement with regard to the level of incentives that would influence the company's performance behaviour, while also ensuring that the financial viability of the company is not compromised. If the size of the revenues at risk under the performance regime becomes very large relative to the allowed revenues and profits, the volatility of the company's return (ie, business risk) is increased.

The link between performance incentives and allowed profits appears to be acknowledged by Postcomm (and Postwatch), as it has been for other UK regulators. However, Postcomm's proposals do not appear to take into account the regulatory precedents in other sectors for the level of exposure under a performance regime, with the aim of assessing whether Postcomm's proposed level of service incentives would be consistent with relevant regulatory best practice.

Two main conclusions emerge from this report.

- Most of the UK regulators tend to favour a two-sided incentive scheme of penalties and rewards as a way of creating adequate incentives for the companies to achieve service standards. Of all the sectors reviewed in this report, the only example with a one-sided incentive scheme is BAA's London airport. However, the industry regulator expressed no automatic preference for a one-sided scheme, acknowledging the advantages of two-sided incentives. Therefore, Postcomm's one-sided incentive approach appears to be out of line with the regulatory trends in other UK sectors.
- The levels of profit exposure of other UK regulated utilities vary considerably, but are typically limited to a mid-range of around 15% of allowed profits, and do not exceed around 40%. In the case of BT, the price control has never included a financial exposure for service quality failure. In the case of the railways, the level of exposure is unlimited, although in the three years to April 2004, the average did not exceed 70% (including the Hatfield derailment). Consequently, the level of financial exposure for service quality failure proposed by Postcomm is not generally supported by regulatory precedent and appears to be out of line with all other UK regulators.

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