Use of Comparators

Final Report

Europe Economics
Chancery House
53-64 Chancery Lane
London WC2A 1QU
Tel: (+44) (0) 20 7831 4717
Fax: (+44) (0) 20 7831 4515
www.europe-economics.com

6 April 2011

TABLE OF CONTENTS

EXECUTIVE SUMMARY

1 This report has been prepared by Europe Economics for Ofwat. It presents a number of different approaches to the use of comparisons by regulators in the UK and abroad in a variety of contexts. It also discusses the applicability of these approaches for Ofwat and provides recommendations on how Ofwat might use comparisons in the future, taking account of potential market reform.[1]

2 In conducting this work we have engaged with a number of regulatory bodies, namely Ofgem, the Office of Rail Regulation, Ofcom, the UK Civil Aviation Authority, the National Water Commission in Australia, the Australian Energy Regulator, and the Dutch Office of Energy Regulation. We thank all those we spoke to for their feedback and comments.

3 Since April 2005, Ofwat has a statutory duty to contribute to the achievement of sustainable development. Ofwat is involved in a number of projects to deliver sustainability over the long term, including challenging the way in which data are collected and monitored in Ofwat's accountability framework. Ofwat has stressed its commitment to changing its approach to regulatory compliance. In particular, Ofwat has suggested a move towards a more risk-based approach, which would reduce the size of reporting requirements for companies.[2]

4 As part of Ofwat's "sustainable water" programme, Ofwat is carrying out work on future price limits to explore the question of how Ofwat should set price controls in 2015 and beyond, in order to meet the long term challenges facing the water and sewerage sectors in England and Wales. As part of this work, Ofwat has an objective to explore different approaches to the use of comparators. The objective of this study is to focus on how Ofwat and other regulators use comparators, identify areas for improvement or expansion, and to offer alternative approaches that can be applied under different scenarios for the structure of the industry in the future.

5 Ofwat provided Europe Economics with a possible preliminary model of how it might set price limits in the future (shown in the diagram on page 9). Under this model Ofwat would set fully separate and binding price limits for retail water and sewerage services. For the remaining "wholesale" business units, Ofwat could set sub price limits that are separate but not necessarily binding, e.g. for water resource services and network plus (water and sewerage). The resources business would focus on providing water resources efficiently including managing abstraction licences. The network plus business unit would provide most of the water and sewage services that the companies currently provide. The network plus unit would include system operation, the functions of which would be

[1] References to potential market reform throughout this report recognise that whilst Ofwat can implement some aspects of market reform itself by changing the way in which it regulates e.g. to encourage water trading where this is efficient, other areas of market reform, including abstraction licence reform and retail market reform, involve decisions that will need to be taken by the UK and Welsh Assembly Governments.

[2] Ofwat: Getting it right for customers – how can we make monopoly water and sewerage companies more accountable?

network optimisation, fair access to assets, long-term planning and investment co-ordination, and connections.

6 This report presents and analyses different approaches to the use of comparators and how they have been applied in different markets. We provide a review of how Ofwat and other regulators, both in England and Wales and internationally, use comparators. We also consider the value of these comparisons in Ofwat's regulatory approach given the work required to implement these approaches and any constraints involved, and taking account of Ofwat's preliminary model.

7 In order to provide a useful classification of the many different ways in which comparators can be used, we have considered different approaches along three dimensions of using comparators:

- the different aspects of performance that are being compared;
- the way in which the comparisons are carried out; and
- how the results of the comparisons are used.

8 In addition to regulatory precedents for each different approach to the use of comparators, the discussion provides an appraisal of the advantages and disadvantages of the approach and a discussion of the applicability of the approach to Ofwat, taking into account any data issues involved and the impact of potential market reform.

9 In the light of this analysis we present some recommendations for how Ofwat might consider using comparators in the future. It is important to note that these recommendations are tentative, and further analysis of the specific costs and benefits of applying them would be needed if Ofwat were minded to implement them. In particular, the analysis has highlighted the costs associated with using comparators in terms of collecting data, cleaning it and carrying out analysis.

10 While some of the recommendations could be carried out using data that Ofwat already collects, some of them would require additional data to be collected, perhaps as part of Ofwat's accounting separation work. At the same time, Ofwat's regulatory compliance project is reviewing Ofwat's approach to data collection.

11 The most appropriate way to use comparators is likely to vary at different stages of any potential market reform. We therefore discuss our recommendations under different stages of potential market reform, in particular, under a medium-term regulatory framework and a long-term regulatory framework.

Medium-term regulatory framework

12 We define "medium-term regulatory framework" as the framework which would apply as potential market reforms are implemented, but before competition has developed sufficiently to allow competition to replace regulation for contestable parts of the value

chain. Ofwat recognises in the preliminary model consultation that decisions around legal separation are for the UK and Welsh Assembly Governments. We assume that Ofwat's Future Price Limits preliminary model is implemented alongside potential market reform. One implication of this is that regulatory arrangements are likely to differ for different parts of the value chain.

Retail business units

13 For the retail business units, some key uses of comparators may be as follows:

(a) Comparisons of the cost of water and sewerage retailing to inform the setting of default tariffs in contestable parts of the retail market and price caps in the non-contestable parts. It may be appropriate not to use comparisons to drive efficiencies as hard as for the network plus part of the value chain, in order to leave headroom for new entrants in the contestable part of the retail market and thus encourage competition to develop more quickly. Detailed econometric modelling may not be appropriate for water and sewerage retailing. Instead, Ofwat might make use of simple cost comparisons in order to inform what cost allowances are reasonable for different elements of retailing costs.

(b) The possible use of relative price regulation, in a scenario in which effective competition has developed in some segments of the contestable market but not in others. The size of the maximum permitted gap between the tariffs that firms charge in the more competitive and less competitive segments of the market should be based on cost differentials assessed using simple cost comparisons. This approach would allow Ofwat to roll back regulation as competition develops, while continuing to protect the most vulnerable customers in the contestable market.

(c) Rules to ensure that firms supplying or seeking to win customers in the contestable parts of the retail market provide comparable information to enable customers to make an informed choice of supplier. As a minimum, Ofwat should require firms to provide comparable information on the tariff they are offering.

(d) Comparisons of the quality of service provided to customers (and the number of customer complaints) to check that incumbent retailers with market power are not cutting back on service quality (as part of a risk-based approach to regulatory compliance), to monitor the overall impact of retail competition on customer service, and to provide reputational incentives to firms. These comparisons could make use of some of the existing data collected for the Service Incentive Mechanism.

Network plus business units

14 The use of comparators for the network plus part of the value chain is likely to have most similarities with how Ofwat uses comparators within the existing regulatory framework. Some key uses of comparators for network plus business activities may be as follows:

(a) Continued econometric comparisons of opex efficiency. Here, it may be possible to make greater use of sub-company and panel data.

(b) Continued use of unit cost comparisons to assess the costs of capex projects.

(c) Comparisons of TFP[3] growth across water and sewerage companies and across comparator sectors to inform frontier shift assumptions, thus enabling customers to benefit from anticipated future improvements in productivity. These comparisons would require data on costs and outputs to be collected from comparator sectors during water and sewerage price reviews.

(d) Comparisons of the quality of network services. (This is likely to involve the collection of new data.)

(e) Financial comparisons at price reviews to inform Ofwat's weighted average cost of capital (WACC) determination, and on-going financial comparisons to monitor the financial robustness of water and sewerage companies. The latter will be particularly important during the implementation of potential market and regulatory reform and in the initial years of the new regime, given that stakeholders appear to be particularly concerned about the impact of potential market reforms on investors. Financial metrics could be compared across water and sewerage companies and through time, as well as with comparator sectors. The results could be used for internal briefing purposes, and might on occasions inform decisions by Ofwat either to refine proposals for potential market or regulatory reform or to make announcements to clarify its existing stance.

(f) Comparisons of the environmental performance of network plus activities focusing on environmental issues relevant at this level of the value chain. This might involve a mix of quantitative comparisons (e.g. carbon emissions) and qualitative comparisons (e.g. company processes for embedding sustainability within decision-making). Ofwat may carry out certain comparisons in conjunction with the Environment Agency and the Drinking Water Inspectorate.

15 With regard to the system operation functions within each regional network plus business, some key use of comparators may be as follows:

(a) Comparisons of the cost of carrying out the system operation function, with consideration given to both internal costs (e.g. the cost of staff, buildings and equipment) and external costs (e.g. the cost to trading with other parties to optimise network usage). In early years when the drivers of system operation costs may not

[3] Total Factor Productivity (TFP) measures the relationship between output and all factors of production used to produce it. Growth in TFP represents output growth not accounted for by the growth in inputs.

be understood, this might be done through simple comparisons of unit costs for different elements of system operation costs.

(b) Qualitative comparisons of how companies carry out their system operator functions. This could be particularly useful if in the future Ofwat decides that a different approach to the way this role is regulated is needed and if separation is identified as appropriate for a future price control. Such comparisons would help spread best practice across the new system operators and enable Ofwat to identify best practice for the purpose of setting price caps at subsequent price reviews.

(c) Comparisons of the quality of "wholesale" services provided to retail companies and the quality of "access" services provided to new entrants into resources and treatment services. Initially, these comparisons might be for information purposes only. This would help to ensure that water and sewerage companies do not reduce the costs of system operation at the expense of quality of service. Further, the provision of a good level of quality of service to companies operating in the contestable parts of the value chain may help to underpin the development of competition.

(d) Comparisons of security of supply, given the importance of security of supply and the fact that under Ofwat's preliminary model the system operator function within the network plus business units will be responsible for long-term planning and investment co-ordination.

Resources business units

16 The costs of the resources business units could be seen as comprising both internal costs (e.g. the cost of staff, buildings and equipment) and external costs (the price paid for abstraction rights). Some potential uses of comparators for the resources business units may be as follows:

(a) Comparisons of the internal costs of resources units to inform the costs that should be allowed for with the price of any regulatory contract for the supply of water. Simple cost comparisons (e.g. on a unit cost basis) should be used to inform a regulatory judgement regarding what constitutes a reasonable cost for different elements of internal costs.

(b) Comparisons of regional prices of water may be useful if regional upstream markets develop for raw water. New pricing data would need to be collected, probably from the market operator or a price reporting agency rather than the companies involved in trading. These prices could be analysed alongside interconnection and bulk supply activities by companies, to see whether the market was responding to price signals in the way that might be expected.

(c) Comparisons of the environmental impact of abstraction. This area of regulation falls within Environment Agency's remit, and hence any decision on the use of comparators would ultimately lie with the Environment Agency. Any such comparisons could be useful in identifying whether upstream resources competition is

having perverse impacts on the environment due to the lack of an abstraction pricing regime which reflects environmental costs.

Long-term regulatory framework

17 We define the "long-term regulatory framework" as the regulatory framework that would apply once competition has developed sufficiently to allow competition to replace regulation for contestable parts of the value chain.

18 We consider that many uses of comparators would be the same in the medium-term and long-term regulatory frameworks. This is likely to be particularly true for the network plus business which includes the system operation function.

19 The main area in which comparators may be used differently in the long-term regulatory framework is for the retail activity. It is possible that competition might develop sufficiently to allow price regulation to be removed for customers in the contestable part of the retail market. However, Ofwat would still need to use comparators for the purpose of setting retail price caps for customers in the non-contestable part of the retail market. Once effective competition has been established in the contestable part of the retail market, competition itself would provide incentives for firms to provide a good quality of customer service, and hence there may be no need for the regulator to carry out such detailed comparisons of quality of service.

20 The role that comparisons might play in the retail market if competition were to become established might be as follows:

(a) Comparisons of price and quality of service as part of a monitoring regime to allow the regulator to intervene *ex post* if any problems were identified.

(b) Comparisons of customer complaints relating to firm behaviour in the contestable retail market.

(c) Rules to ensure that firms supplying or seeking to win customers in the contestable retail market provide comparable information (e.g. on tariffs) to enable eligible customers to make an informed choice of supplier.

Implementation tools

21 There are some uses of comparators which do not relate specifically to a particular stage of potential market reform, but are instead "implementation tools" that could assist Ofwat in moving from one stage of potential market reform to the next. Some key uses of comparators that fall into this category are as follows:

(a) Comparisons to assist with periodic reviews of the state of competition. Such reviews might play an important role in helping Ofwat decide when it can adopt lighter-touch forms of regulation, or remove regulation altogether, for contestable parts of the value chain.

(b) Comparisons of competing bids to allocate funding for pilot schemes. If Ofwat wished to carry out pilot schemes to test new market structures, then comparisons would be important in determining which firms should carry out such pilot schemes.

(c) Qualitative comparisons between water and sewerage companies to identify best practice for policy development purposes.

(d) International and cross-sectoral comparisons for policy development purposes.

1 INTRODUCTION

1.1 This report on the use of comparators has been prepared by Europe Economics for Ofwat and presents a number of different approaches to the use of comparisons by regulators in the UK and abroad in a variety of contexts. It also discusses the applicability of these approaches for Ofwat and provides recommendations on how Ofwat might use comparisons in the future, taking account of potential market reform.

Background to the study

1.2 As part of Ofwat's "sustainable water" programme, Ofwat is carrying out work on future price limits to explore the question of how Ofwat should set price controls in 2015 and beyond, in order to meet the long term challenges facing the water and sewerage sectors in England and Wales. Within the work on future price limits, Ofwat is undertaking a sub-project that considers approaches to the assessment of cost efficiency and cost recovery (the opex capex sub-project).

1.3 Ofwat currently makes extensive use of comparators within the regulatory process. For example, comparisons are made to:

(a) assess costs for both opex and capex;

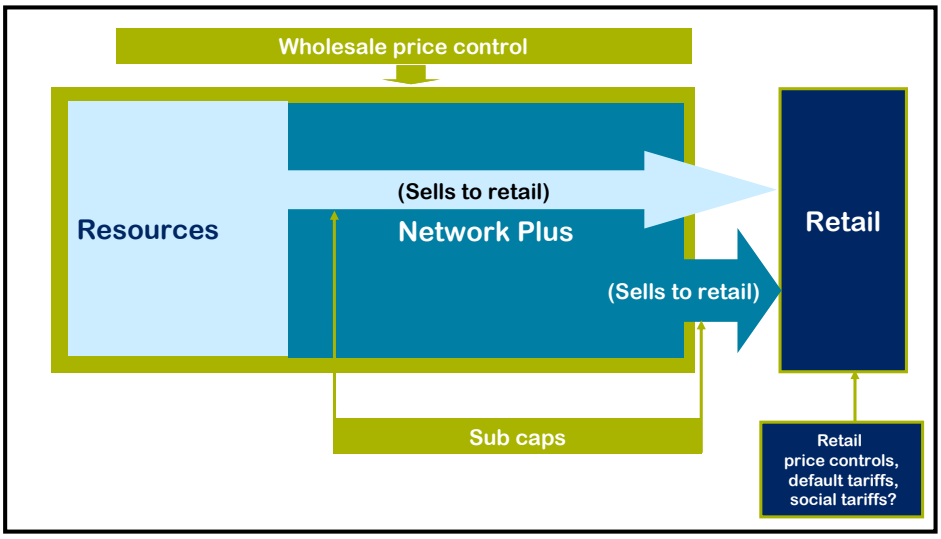
(b) assess the effect of mergers;

(c) compare levels of customer service, financial performance and network activity; and

(d) assess industry best practice.

1.4 Within the opex capex sub-project, Ofwat has an objective to explore different approaches to the use of comparators. The objective of this study is to focus on how Ofwat and other regulators use comparators, identify areas for improvement or expansion, and to offer alternative approaches that can be applied under different scenarios for the structure of the industry in the future.

1.5 Ofwat provided Europe Economics with a possible preliminary model of how it might set price limits in the future (shown in the diagram below). Under this model of potential market reform, Ofwat would set fully separate price limits or indicative prices for retail water and sewerage services. For the remaining "wholesale" business, Ofwat could set sub price limits that are separate but not necessarily binding e.g. for water resources, and for network plus (water and sewerage). The resources business would focus on providing water resources efficiently including managing abstraction licences. The network plus business unit would provide most of the water and sewage services that the companies currently provide. The network plus unit would include system operation, the functions of which would be network optimisation, fair access to assets, long-term planning and investment co-ordination, and connections.



Scope of the Report

1.6 This report presents and analyses different approaches to the use of comparators and how they have been applied in different markets in order to provide Ofwat with a reference tool to guide it in developing its approach to regulation. In particular, we provide a review of how Ofwat and other regulators, both in England and Wales and internationally, use comparators; and the value of these comparisons in Ofwat's regulatory approach given the work required to implement these approaches and any constraints involved, and taking account of potential market reform.

1.7 In addition to the use that Ofwat currently makes of comparisons, we consider the use of comparators by the following regulators: Ofgem, the Office of Rail Regulation (ORR), Ofcom, the Civil Aviation Authority (CAA), the National Water Commission (NWC) in Australia, the Australian Energy Regulator (AER), the Dutch Office of Energy Regulation (Energiekamer), and the Australian Competition and Consumer Commission (ACCC).

1.8 We conducted detailed desk research focusing on regulatory documents published by these regulators. In addition, we carried out interviews with the majority of these regulators to provide insight into regulatory experience with the use of comparators that may not have been obtainable from published documents.

1.9 In order to provide a useful classification of the many different ways in which comparators can be used, we have considered different approaches along three dimensions of using comparators:

(a) the different aspects of performance that are being compared;

(b) the way in which the comparisons are carried out; and

(c) how the results of the comparisons are used.

1.10 The discussion of each different approach to the use of comparators is structured in the same way, with a brief description of the approach, some examples of how it has been applied, an appraisal of the advantages and disadvantages of the approach, and a discussion of the applicability of the approach to Ofwat taking into account the impact of potential market reform.

1.11 This report is intended to be a reference tool to guide Ofwat in developing its approach to regulation. Where an example of the use of comparators is relevant to more than one approach to comparisons, the example has been included in all the relevant sections so that the reader does not have to cross-refer to an example elsewhere in the report.

Structure of the report

1.12 The report is structured as follows:

(a) Section 2 provides a brief overview of the different ways in which comparators are used by Ofwat and the other regulators considered in this study;

(b) Section 3 considers comparisons of different aspects of performance;

(c) Section 4 considers different techniques that are used to make comparisons;

(d) Section 5 considers different uses of the results of comparisons;

(e) Section 6 provides an overview of the data that Ofwat currently collects and identifies areas for expansion using this data; and

(f) Section 7 provides some recommendations for the use of comparators in the future.

2 OVERVIEW OF REGULATORY PRECEDENTS

2.1 In this Section, in addition to the use of comparators by Ofwat, we provide an overview of the use of comparators by the following UK regulators: Ofgem, the Office of Rail Regulation, the Civil Aviation Authority and Ofcom. In addition, we provide some examples of comparisons made by some international regulators, namely: the National Water Commission in Australia; the Australian Energy Regulator; the Dutch Office of Energy Regulation; and the Australian Competition and Consumer Commission (telecoms).

Summary of Use of Comparators by Regulators

Ofwat

2.2 Ofwat makes extensive use of comparators in the regulatory process, both within price controls and to inform policy development for future price controls.

2.3 A major use of comparators is to inform the relative efficiency of firms' costs for both operating expenditure (opex) and capital expenditure (capex), and to assess the scope for improvement in opex and capex. Using company data collected through the June returns, Ofwat has undertaken regression analysis to monitor annual performance of firms' relative efficiency on operating expenditure. At the price review, the results of the regression analysis using Corrected Ordinary Least Squares (COLS) were used to calculate the "catch-up" efficiency rate for the water (and sewerage) companies. At price reviews, Ofwat also looked at the scope for continuing efficiency (frontier shift) in the industry by comparison with other sectors and markets. Additionally, when making interim determinations of K (IDoKs) Ofwat uses both qualitative and quantitative comparisons to challenge companies' applications and determine the costs reasonably attributable to relevant items. In terms of capex, Ofwat carries out unit cost benchmarking analysis in its cost base approach to derive assessments of capital efficiency for inclusion in the Capital Expenditure Incentive Scheme (CIS).

2.4 Ofwat previously used comparisons between firms in the Overall Performance Assessment (OPA) to provide incentives to firms to improve their standards of quality of service. The comparative assessment used graduated performance bands set around mean performance for a variety of indicators. A company that scored well on the OPA was allowed to charge its customers slightly more, while downward adjustments to price limits were made for those companies that did not perform as well. Since April 2010, Ofwat has been using the Service Incentive Mechanism (SIM) which comprises a quantitative indicator that measures complaints and unwanted contacts, and a qualitative indicator that measures how satisfied customers are with the quality of service they receive. The overall SIM score is produced by combining the two measures, with both having equal weighting.

2.5 An important element of price reviews is the cost of capital and financeability. Comparisons are used as a guide and sense-check against Ofwat's own assumptions

when determining the Weighted Average Cost of Capital (WACC). In addition, Ofwat also compares, amongst other things: the historic actual cost of debt; draft business plans (DBP) and final business plans (FBP) for companies, to compare their views on forward looking WACC; DBP and FBP dividend policies; and Market to Asset ratios (MARS) for listed companies.

2.6 Ofwat currently makes comparisons to monitor firms' environmental performance by collecting carbon accounting data in the June returns. Renewable energy generation values are also collected in the June returns, and comparisons are made to reveal differences in the uptake of renewables between companies. Further, *ad hoc* comparisons are used to monitor firms' adaptation to climate change risks.

2.7 Ofwat also makes use of international comparisons to inform areas of policy development. In particular, qualitative comparisons with international experience are used to develop future approaches to regulation; and, where possible, quantitative comparisons of international data are used to benchmark performance indicators.

Ofgem

2.8 Ofgem makes use of comparators in the regulatory process for gas and electricity, both within price controls and as a means of developing policy approaches.

2.9 Ofgem undertakes comparative benchmarking of network investment for electricity distribution firms whereby it reviews the distribution network operators' (DNOs') investment forecasts in light of its modelling and benchmarking work (where Data Envelopment Analysis (DEA) is used as a cross-check of corrected ordinary least squares results) and other evidence to form an overall view on the appropriate baseline level of costs. For electricity DNOs' operating expenditure, Ofgem uses time series regressions to benchmark separately asset replacement unit costs, indirect costs and network operating costs. Sense checks of the regression results are undertaken using previous DNO forecasts and their actual performance, and broader information on the quality of the data provided. Additional information is also incorporated into the benchmarking, such as allowing DNOs to remove costs from the general unit cost analysis where they could justify them as being atypical, and to remove costs associated with work which is not carried out by other DNOs.

2.10 Ofgem also uses comparisons in its analysis of gas distribution networks' (GDNs') operating expenditure efficiency. In the 2007 price review, Ofgem made use of regression analysis to assess the scope for efficiency savings by GDNs by benchmarking the efficiency of individual activities within direct and indirect operating cost areas where it was practical to do so. Benchmarking at an individual activity level was undertaken to increase the number of data points. These costs were then rolled forward to take account of the forecast number of repairs, Ofgem's assumptions on ongoing efficiencies, and real growth in the cost of contract labour, direct labour and materials.

2.11 The data needed for regression analysis for both gas and electricity distribution require a significant amount of adjustment to make them comparable (particularly to account for

accounting differences and the different ways in which companies captured costs), and to strip out non-cost elements. Ofgem has been working to improve the data quality by collecting data more regularly (similar to Ofwat's June Returns).

2.12 Ofgem uses comparisons across both gas and electricity distribution networks to encourage and incentivise quality of service. Ofgem collates and publishes quality of service information for Gas Distribution Networks (GDNs) in the form of a "balanced score card". This allows Ofgem to make comparisons of performance between GDNs, although no financial incentive is attached to the measure. The scorecard focuses on GDNs' performance across a number of key areas such as gas supply, gas safety, accuracy of pipe-line records, customer service and complaints.

2.13 Ofgem also has a discretionary reward scheme for GDNs, which aims to encourage and drive performance in areas that cannot be easily measured or incentivised through more mechanistic regimes (such as environmental impact reduction; network extensions and the promotion of gas safety). The scheme has a maximum total annual reward of £4 million available across all eight GDNs, and Ofgem compares submissions from GDNs in order to assess how to allocate the funding. For electricity distributors Ofgem introduced the Electricity Distribution Customer Service Reward in 2006, an initiative to recognise and reward distribution companies that demonstrate best practice for consumers in areas that cannot be easily measured or incentivised through more mechanistic regimes, such as initiatives relating to priority customer care and corporate social responsibility. Entries from distribution companies are judged by a multidisciplinary independent panel to assess which companies should be rewarded.

2.14 Ofgem also uses comparisons to allocate funding under specialist funding schemes, in particular the Low Carbon Network Fund. As part of the new price control arrangements that run from 1 April 2010 to 31 March 2015, the Fund will allow up to £500 million support to projects sponsored by the electricity distribution network operators to understand what they need to do to provide security of supply at value for money as Great Britain moves to a low-carbon economy. Projects must meet certain minimum criteria before they are evaluated by an independent expert panel, which will make recommendations as to which project should be awarded funding.

2.15 Ofgem places requirements on gas and electricity suppliers to provide comparable information to customers through bills and annual statements. This includes information on consumption compared with the previous year, projected costs and fuel mix disclosure. The requirements stipulate that the information provided to customers be standardised and comparable. The aim of the information requirements is to equip customers better to compare the charges and service quality of their supplier with other suppliers, and to facilitate switching where appropriate.

Office of Rail Regulation (ORR)

2.16 The Office of Rail Regulation (ORR) makes use of comparators within the price control in order to set the access charges for Network Rail and to identify best practice.

2.17 Cost efficiency benchmarking of Network Rail is a key part of the ORR's regulatory work which is used to establish the levels of access charges at periodic reviews. Since Network Rail is a single national monopoly, the ORR benchmarks the cost efficiency of Network Rail against international comparators, predominantly made up of west European rail infrastructure managers. The ORR conducts two complementary types of efficiency analysis: top-down econometric analysis and bottom-up engineering-based analysis.

2.18 For the econometric analysis, the ORR makes use of the "Lasting Infrastructure Cost Benchmarking" (LICB) dataset developed and maintained by the International Union of Railways (UIC) for 14 European rail infrastructure managers covering the period 1996 to 2008.

2.19 The ORR uses the bottom-up analysis as a cross-check and to better understand the "efficiency gap" calculated using the top-down approach. In this approach, Network Rail's efficiency is compared to four international comparators. The gap analysis work for the price review in 2008 included work by consultants which looked at individual technologies and working methods used by the infrastructure managers. This piece of work for the ORR included the development of two ideal network models, based on a set of standard network characteristics, to test the impact and scale of different maintenance and renewal practices.

2.20 As part of its work for the 2008 Periodic Review, the ORR conducted a one-off best practice study, comparing infrastructure managers in several countries in Europe, North America and Australia. The information was reviewed qualitatively by experts to assist in the assessment of Network Rail's expenditure plans and to enable a determination of the appropriate expenditure required.

2.21 The ORR uses comparators when estimating equity betas. It uses UK companies from other network industries (e.g. post, water) and also non-utility companies (e.g. big supermarkets) as comparators. Some comparisons of credit ratings with other companies (e.g. Deutschebahn and SNCF) are carried out.

Civil Aviation Authority (CAA)

2.22 The CAA makes use of comparators in its regulation of both the air traffic controller NATS and the three designated airports.

2.23 NATS is the only air traffic controller in the UK, and finding comparators with other UK companies is very difficult given the unique role and operation of the air traffic controller. International comparisons are also hard to find due to differences in reporting across countries. However, the quality and comparability of international data have increased through EU initiatives to encourage Member States to record and report data using similar metrics (such as total cost per flight and employment per flight).

2.24 The CAA uses comparators predominantly in assessing operating expenditure. This is done through bottom-up process-level benchmarking, whereby different aspects of NATS'

operating expenditure are considered separately. For example, unit costs of employment in different areas (e.g. finance, engineering) as well as back office costs are compared with costs for similar areas in other sectors.

2.25 The CAA does not use comparisons mechanistically in its regulatory processes for NATS, but rather to inform more general judgements about how efficient NATS is compared with other industries and assist in decisions whether to accept NATS' projections about the costs it would incur in the future.

2.26 The CAA makes greater use of comparators in airport regulation given the existence of comparator airports within the UK, although the significant differences across airports do limit this usage. Comparators are again mainly used in assessing operating expenditure, through the use of a similar benchmarking approach to that used in the regulation of NATS. The various aspects of the airport business are separated out, and unit costs compared across other airports and to costs in other sectors.

2.27 Comparing capital expenditure across airports is difficult as investment is lumpy and unit costs are not easy to identify. The CAA rather encourages companies to develop their own benchmarks and continually assess these.

2.28 During its price review process for airports, the CAA compares prices for domestic and international airports with those set for the three designated UK airports. This analysis does not feed directly into the price-setting process, and instead serves as contextual information to enable the CAA to see how the prices of the designated airports fit in with other airports. The analysis also provides background information for stakeholders.

2.29 The CAA obtains price data from external sources such as trade associations and industry trade bodies (rather than internal reviews). As these data are taken from publicly available sources, and given that they do not factor into price-setting decisions, the CAA does not undertake much assessment or adjustment of the data (e.g. in terms of checking for errors).

Ofcom

2.30 Ofcom uses comparisons in setting the wholesale broadband access control for BT Openreach. Ofcom uses a range of other comparisons for monitoring prices and other outcomes, as well as comparisons to inform consumers.

2.31 Ofcom commissioned a comparative efficiency assessment of BT Openreach in 2008. The focus of the assessment is on the activities of BT Openreach which are involved in providing wholesale line rental and unbundled local loop services. The assessment concentrated on these two services as Ofcom had to determine what future price controls should be applied to these services. The dataset used comprised data on costs, network size, and environmental and quality of service variables for approximately 70 US local exchange companies for the years 1999 to 2006. The results of the benchmarking inform an efficiency gap analysis that is used in the wholesale broadband access control. Ofcom

also commissioned a benchmarking study using a unit cost model of both opex and capex.

2.32 Ofcom compared Openreach's forecasts on unit and aggregate cost trends with costs for other European countries using data from European Commission reports. This is to assess whether the forecasts are well-founded and represent efficient provision of services.

2.33 Ofcom compares BT's prices relative to prices for similar products offered by incumbents in Europe, North America and Japan, using data from the European Commission and the Organisation for Economic Co-operation and Development (OECD). This is not pursuant to any particular regulation; rather, it is done for monitoring purposes and to assist regulatory thinking.

2.34 Ofcom began research in 2008 into the performance of UK fixed-line residential broadband connections, in respect of actual broadband speeds. Ofcom published reports in 2009 and 2010 comparing the performance of different service providers, and expects to publish further reports at roughly six-monthly intervals. The aim of the reports is to act as a reference source for consumers and other stakeholders.

2.35 In 2009, Ofcom commissioned a study to investigate the relationship between the level of mobile termination rates and certain market outcomes, particularly with regard to retail prices, usage and the take-up of mobile services. The aim of the study was to inform Ofcom in the context of the debate and contribute to possible policy development in the regulation of mobile termination rates.

2.36 Ofcom regulates leased-line services and used metrics to assess whether or not there is sufficient competition in the central London zone compared with other areas, as entry is more likely in metropolitan areas where there is a large volume of traffic.

2.37 Ofcom makes use of comparisons in cost of capital estimation in the determination of the equity risk premium and equity beta. Comparators are chosen that have similar capital intensities. Ofcom sometimes compares credit ratings for financeability assessments.

National Water Commission, Australia

2.38 The NWC was established in 2004 as a co-ordinating body for the National Water Initiative (NWI), an inter-state agreement to improve the way in which Australia manages its water resources. The NWC is not a regulatory agency, and water regulation is carried out separately by each jurisdiction (state).

2.39 One of the aims of the NWI is to improve the quality and transparency of reporting of water data by companies. To meet this aim the NWC has been publishing national performance reports for urban and rural water companies for the past few years. Reports for rural and urban companies are published separately given the large differences in the nature of the companies. Rural performance reports do not contain any comparisons across companies as these differ greatly according to the geographical area and the use

of water (e.g. crop irrigation; livestock); however, companies are presented and discussed separately.

2.40 Urban performance reports provide comparative information on urban water firms. At present the comparative information is not used for regulatory purposes by the NWC, although some states do use the information in the reports to assist them when they make their regulatory determinations. The NWC is considering developing its approach to comparisons of companies in the future. This will involve publishing ranges of "recommended" tariffs for different types of urban firms. This will not involve any ranking given the wide differences between companies.

2.41 The data for the reports are collected from water companies by the individual states and entered by each state into a central database managed by NWC. Data from rural companies are only collected from companies over a certain size to reduce the regulatory burden (if the costs of reporting are not more than 1 per cent of their total revenue), although companies under the threshold can still report on a voluntary basis. The NWC issues a handbook with guidelines on accounting and reporting methods to ensure that the data reported are as comparable as possible. Data are audited on a three-year cycle for each company to check for errors and improve robustness. There are still some issues relating to definitional interpretations and the use of different auditors that pose problems for the comparability of the data and the consistency with which it is audited.

Australian Energy Regulator (AER)

2.42 The Australian Energy Regulator (AER) is responsible for regulating electricity and gas networks in Australia. The use of comparators by the AER is relatively limited given the difficulties in comparing data between businesses. We outline below some examples of the use of comparators by the AER.

2.43 The AER carries out some benchmarking of costs for electricity distribution network service providers (DNSPs). However, the AER does not set revenue allowances on the basis of the benchmarking results; instead, the benchmarking results are used as a cross-check for bottom-up approaches to assessing the scope for efficiency improvements. The AER carries out unit cost comparisons for opex and capex (and recently they have carried out some regression analysis); however, there are limited data available because of the way in which each DNSP reports information in their audited accounts. In addition, benchmarking is difficult due to extreme geographical differences between the DNSPs. In particular, the weather and operating environments vary considerably from state to state.

2.44 The AER also produces a report which details the performance of gas distribution network service providers (DNSPs). The report compares financial performance, reliability of supply, network reliability and customer service. The purpose of these comparisons is to encourage competition between gas DNSPs by providing an incentive for DNSPs to improve performance relative to one another, and to provide customers with information about the services they are receiving.

2.45 Network businesses also have to report to the AER on an annual basis on the projects that have been undertaken under the banner of demand management. This allows the AER to assess the projects against various criteria for the purposes of the demand management incentive scheme in place, but it also allows information sharing between businesses and helps to identify best practice with regard to demand management.

The Office of Energy Regulation (Energiekamer), Netherlands

2.46 The Dutch Office of Energy Regulation (Energiekamer) has a yardstick approach in place for the regulation of gas and electricity networks. An interesting feature of the Dutch experience is that in order to ensure that the efficiency improvements are not made at the expense of the reliability of the network, the regulator couples quality regulation with yardstick regulation. This involves the benchmarking of total expenditure using panel data techniques. In establishing the Q factor for quality, the regulator compares the quality of a firm's network to the average quality of all electricity distribution networks in the Netherlands, and a monetary value is put on any deviation from the average quality. Network operators with a higher than average quality receive extra revenues through higher tariffs.

2.47 The regulator also uses international comparisons to benchmark costs for TenneT, the transmission system operator in the Netherlands. Benchmarking using unit-cost comparisons and DEA techniques are carried out to estimate two efficiency improvement parameters in the revenue cap for TenneT: the individual efficiency catch-up target and the expected annual productivity increase.

2.48 For both distribution and transmission activities, the regulator places a lot of weight on the results of the benchmarking exercise. The results are used mechanistically to determine the cost allowances for the firms.

Australian Competition and Consumer Commission (ACCC)

2.49 We have considered how the Australian Competition and Consumer Commission (ACCC) uses comparisons with regard to telecoms. We highlight below examples of the use of comparators by the ACCC in this area.

2.50 The ACCC carried out comparisons involving 14 other countries on access prices for the unconditioned local loop service when considering whether the Australian incumbent's (Telstra's) proposed monthly access charge for "Band 2" (which relates to metropolitan areas) was excessive. The ACCC also used other comparators such as the access provider's internal transfer price, the retail price, and cost model estimates.

2.51 The ACCC is in the process of reviewing the way in which prices are set in the communications sector for the Domestic Transmission Capacity Service (DCTS) provided by Telstra. This would involve benchmarking the prices of the DTCS with those for domestic, competitive routes using data from domestic studies of prices; international benchmarking reports; and prices calculated using route-based pricing models.

Summary Table of Regulatory Precedents

2.52 The table below summarises the examples of the use of comparators that are referenced in this report:

Regulator	**Sector**		**What is being compared**	**How are comparisons made**	**What are results used for**	**Are comparisons national or international**	**Are comparisons used as a substitute to competition or to support competition**
Energiekamer	Electricity	Yardstick competition - X factor and Q factor	Combination of costs and quality	Regression techniques; simple metrics	To set cost allowances; to underpin mechanistic performance incentive schemes	National	Substitute to competition
Energiekamer	Electricity and gas	Analysis of developments on the Dutch wholesale markets for gas and electricity	Competition	Simple metrics	To monitor behaviour	National and international	To support competition
Ofgem	Electricity and gas	Review of retail competition	Competition	Simple metrics	To inform policy development	National	To support competition
Ofwat	Water and sewerage	Development of retail market	Competition	Qualitative comparisons	To inform policy development	National and international	To support competition
Energiekamer	Electricity and gas	Distribution network companies - assessment of factors that may cause regional differences in costs	Costs	Regression techniques	To inform policy development	National	Substitute to competition
Energiekamer	Electricity	Cost efficiency of TenneT Transmission System Operator	Costs	DEA	To set cost allowances; to underpin mechanistic performance incentive schemes	International	Substitute to competition
Ofcom	Telecoms	Comparative efficiency of BT Openreach	Costs	DEA	To set cost allowances	International	Substitute to competition

Ofgem	Electricity	Electricity distribution companies' network investment	Costs	Regression techniques	To set cost allowances; to underpin mechanistic performance incentive schemes	National	Substitute to competition
Ofgem	Gas	Operating expenditure efficiency analysis	Costs	Regression techniques	To set cost allowances; to underpin mechanistic performance incentive schemes	National	Substitute to competition
Ofwat	Water and sewerage	Water and sewerage companies' capital efficiency	Costs	Simple metrics	To set cost allowances; to underpin mechanistic performance incentive schemes	National	Substitute to competition
Ofwat	Water and sewerage	Operating expenditure efficiency analysis	Costs	Regression techniques	To set cost allowances; to underpin mechanistic performance incentive schemes	National	Substitute to competition
Ofwat	Water and sewerage	Accounting separation	Costs	Simple metrics	To inform policy development	National	Substitute to competition
ORR	Rail	Network rail cost efficiency	Costs	Regression techniques; DEA; qualitative review alongside quantitative comparisons	To set cost allowances; to underpin mechanistic performance incentive schemes	International	Substitute to competition
Ofwat	Water and sewerage	Climate change assessment	Environmental performance	Simple metrics	To monitor other outcomes	National	Substitute to competition
Ofwat	Water and sewerage	Environment and water quality assessment	Environmental performance	Simple metrics	To monitor other outcomes; to identify best practice for companies; provision	National	To support competition

					of information		
Ofgem	Electricity	Low Carbon Network Fund	Environmental performance; security of supply; technology or processes	Qualitative comparisons	Allocating funding	National	Substitute to competition
Energiekamer	Electricity	Estimation of beta for Dutch grid managers	Financial performance	Simple metrics	To set cost allowances	International	Substitute to competition
Ofwat	Water and sewerage	Financial performance and expenditure comparative report	Financial performance	Simple metrics	To monitor other outcomes	National	Substitute to competition
ACCC	Telecoms	Data Transmission Capacity Service	Prices	Simple metrics	To set prices directly	National	Substitute to competition
ACCC	Telecoms	Telstra's unconditioned local loop	Prices	Simple metrics	To monitor prices	International	Substitute to competition
Ofcom	Telecoms	BT's leased lines	Prices	Simple metrics	To monitor prices	International	Substitute to competition
Ofcom	Telecoms	Mobile termination rates	Prices	Regression techniques	To inform policy development	International	Substitute to competition
Ofgem	Electricity and gas	Information provision under standard licence conditions	Prices	Requirement on companies to provide comparable information to customers	Provision of information	National	To support competition
Ofgem	Gas	Independent gas transporters relative price control	Prices	-	To set prices directly	National	Substitute to competition
Ofwat	Water and sewerage	Water companies customer charges	Prices	Simple metrics	To monitor prices	National	Substitute to competition
NWC	Water	Performance of urban	Quality of service	Simple metrics	Provision of	National	To support

		and rural water companies			information; to monitor other outcomes		competition
Ofcom	Telecoms	Performance of fixed-line broadband delivered to UK residential consumers	Quality of service	Simple metrics	Provision of information; to monitor other outcomes	National	To support competition
Ofgem	Gas	Quality of service comparisons for gas distribution networks	Quality of service	Simple metrics	Provision of information	National	To support competition
Ofgem	Electricity	Customer service reward scheme	Quality of service	Qualitative comparisons	To underpin discretionary performance award schemes; to identify best practice	National	To support competition
Ofwat	Water and sewerage	Water and sewerage companies - the Overall Performance Assessment and Service Incentive Mechanism	Quality of service	Simple metrics	Provision of information; to monitor behaviour; to underpin mechanistic performance incentive schemes	National	To support competition
Ofgem	Gas	Gas distribution discretionary reward scheme	Quality of service; environmental performance	Qualitative comparisons	To underpin discretionary performance award schemes	National	To support competition
AER	Gas	Victorian gas distribution business comparative performance	Quality of service; security of supply	Simple metrics	Provision of information	National	To support competition
Ofwat	Water and sewerage	Annual leakage performance and water efficiency	Security of supply	Simple metrics	To monitor other outcomes; to inform policy development	National and international	Substitute to competition
CAA	Air traffic services	Assessment of NERL's back-office	Technology or processes	Simple metrics	To set cost allowances	National	Substitute to competition

		costs					
ORR	Rail	Network rail cost efficiency gap analysis	Technology or processes	Simple metrics	To set cost allowances	International	Substitute to competition
ORR	Rail	International best practice study	Technology or processes	Qualitative comparisons	To identify best practice for companies	International	Substitute to competition

3 WHAT IS COMPARED?

3.1 Regulators can make use of comparators to assess various aspects of firms' behaviour and performance. In this section we consider comparisons of the following variables:

(a) prices;

(b) costs;

(c) quality of service;

(d) security of supply;

(e) environmental performance;

(f) financial performance;

(g) technology or processes; and

(h) some combinations of the above.

Prices

Description

3.2 Probably the most important reason to impose price regulation in some markets is the prevention of monopolistic behaviour and pricing by those companies that have market power.

3.3 Economic theory proves that, under certain conditions, in a competitive market where firms are "price takers" (i.e. cannot affect the price at which their product is sold), social welfare is maximised. However, when firms have market power (i.e. can choose the price at which their product is sold) prices will tend to be higher than in the competitive case and overall welfare will be reduced.

3.4 Network industries are characterised by high "sunk" costs, associated with the construction of the network, and firms operating such networks often have some degree of market power. Therefore regulators intervene in order to make sure that companies do not extract rent from consumers by charging excessive prices.

3.5 Comparing prices or charges levied by regulated companies with other companies can inform regulators of possible excessive pricing and provide a basis for further investigation or price controls. Price comparisons can also be used as a "sense check" to ensure that wider price controls are effective and result in the setting of reasonable prices.

3.6 Comparing prices can form part of lighter-touch, *ex post* regulation whereby charges are not set explicitly, and the regulator only monitors that the regulated companies' prices are in line with competitive levels. Price comparisons can also be of particular relevance to

cases in which the information available on the business is limited, and the costs of undertaking detailed efficiency studies to establish cost allowances and performance targets outweigh the potential benefits to consumers.

3.7 Comparators can also be used directly for setting price controls, by pegging price limits for a regulated firm to the prices charged by comparator firms. For instance, rather than carrying out a detailed price review for very small firms in a sector, a regulator might choose simply to peg their prices to those of larger firms in the sector that are subject to price regulation.

3.8 In addition to comparing the level of prices, comparisons can also be used to assess whether companies are applying an appropriate charging structure (e.g. in terms of how costs are allocated between different customer groups or the balance between fixed and variable charges).

3.9 Comparator companies can be other regulated firms, either domestic or international; unregulated firms within the same industry operating in a competitive market; or competitive firms operating in other (similar) industries or in other countries.

Practical examples

Ofwat: Customer Charges

3.10 Ofwat currently makes use of comparisons as part of its annual process to approve customer charges levied by water companies. This process ensures that companies stay within the price limits set, and that the charges meet certain conditions. Data are taken from company tariff structures, received through the charge schemes and as part of Ofwat's charge approval process.

3.11 Comparisons of charges across companies are used to inform Ofwat's view when companies propose changes to their charging structure. These comparisons enable Ofwat to develop a more comprehensive view of how the company's charges fit in with the rest of the industry. Where charges do not appear appropriate, Ofwat can challenge companies to justify their positions.

3.12 Straightforward techniques such as the use of graphs and tables, combined with qualitative judgement, are used to review the comparators and assess whether companies' proposed charges seem appropriate. Ofwat applies sense checks to ensure that the companies' data seem reasonable, and also adjusts the data when seasonal tariffs are used to ensure comparability with the rest of the companies.

3.13 Ofwat does not view these comparisons as robust and therefore does not apply them mechanistically. The comparators are used rather to inform Ofwat's view.

3.14 The use of comparators also enables Ofwat to highlight when companies' charges to firms outside the tariff basket (e.g. large users) are unsuitable (e.g. there appears to be price discrimination).

3.15 The use of comparators is beneficial in that it enables Ofwat selectively to place pressure on companies that are not complying with licence conditions. In particular, Licence Condition E requires that charges should not be unduly preferential or unduly discriminatory (i.e. there should be no unnecessary cross-subsidy between different types of customer). Ofwat can assess whether a company's charges for different customer types are in line with each other and challenge those that appear to be discriminatory. The analysis of comparators has also helped Ofwat to identify problems with tariffs and to ensure that the application of price limits is done in such a way as to result in stable patterns in bills.

3.16 Although Ofwat receives the tariff data directly from companies (through the charges approval process), such information is available in the public domain as companies are legally obliged to publish their charges structures, albeit in slightly less detail. There is therefore no great risk related to the availability of the comparators.

Ofcom: Monitoring of BT's leased lines charges

3.17 In its Business Connectivity Market Review in 2008, Ofcom undertook international benchmarking of BT's leased-line prices.[4] This entailed comparing the 2005 and 2006 prices of UK leased lines of different lengths and different bandwidths with those offered by incumbents in Europe, North America and Japan; and comparing 2006 leased-line prices in the UK with the OECD countries.

3.18 Ofcom sourced the data for all the countries within the comparison from two international reports published by the European Commission and the OECD — for reasons of comparability Ofcom did not use data provided directly by BT.

3.19 Ofcom highlighted that robust comparison of the incumbents' prices across countries was not possible, given the many varying factors that influence the price of leased lines other than the intensity of competition. These include factors affecting the retail cost base such as the level of competition in upstream markets, the level at which regulated wholesale charges are set, the prices of other inputs, and the particular tax treatments of the entity supplying the service. In addition, different ways in which firms approach cost recovery, and the fact that services offered may not be identical, further reduce the comparability of prices.

3.20 Ofcom highlighted that in theory BT's prices could be compared with those of competitors within the UK, but that lack of data from competitors (who tend to use bespoke pricing)

---

[4] Ofcom (2008) Business Connectivity Market Review
http://stakeholders.ofcom.org.uk/binaries/consultations/bcmr/summary/bcmr_pt3.pdf.
The review was carried out in accordance with the requirements of the regulatory framework for electronic communications, networks and services which came into force on 25 July 2003 and is aimed at reducing entry barriers and fostering effective competition to the benefit of consumers.

made it difficult to gain a view on representative competitor prices, and thus meaningful comparisons were not possible.

3.21 The aim of the comparisons was to provide an overview of how BT's prices compared with the prices of other countries' incumbents. Ofcom also thought that international benchmarking may provide grounds for further and more detailed analysis of certain market segments, as excessive pricing could be an indicator of significant market power.

ACCC: Domestic Transmission Capacity Service

3.22 The Australian Competition and Consumer Commission (ACCC) is in the process of reviewing the way in which prices are set in the communications sector for the Domestic Transmission Capacity Service (DTCS)[5] provided by Telstra. The 2010 position paper sets out the proposed approach.[6] This consists of benchmarking the prices of the DTCS with those for domestic, competitive routes.

3.23 Benchmarking of prices is viewed by the ACCC as more feasible than basing revenues on costs, given that reported cost data lacks the granularity required to assess the underlying costs of transmission services.[7] Prices in competitive areas and on competitive routes are seen to be broadly reflective of costs.[8] Benchmarking these prices could therefore provide a reference case on which to base DTCS prices, and could be implemented without significant changes to the regulatory accounts framework.

3.24 The ACCC would seek to confirm that such pricing on competitive routes is consistent with estimates of costs and prices from other sources (such as existing pricing models and other sources of pricing information), as an approach based on multiple sources of information would provide greater certainty for the industry. This approach would involve the following stages:

(a) obtaining extensive pricing information directly from service providers;

(b) analysis of pricing information to establish a range of prices for declared (regulated) and non-declared routes according to the basic cost drivers of distance and capacity;

(c) compare the newly established prices with other available transmission cost and price data; and

---

5 High capacity wholesale data services

6 ACCC: 'Domestic Transmission Capacity Service Pricing: An ACCC Position Paper on pricing the domestic transmission capacity service' November 2010 http://www.accc.gov.au/content/item.phtml?itemId=957773&nodeId=566e5cb5d7e79a7fdc17556a5a1f2eeb&fn=DTCS%20pricing%20position%20paper%20Nov%202010%20FINAL.pdf

7 In order to gather this level of data the ACCC envisages significant changes to the regulatory accounts framework would be required.

8 As opposed to international prices of other regulated routes

(d) determine a range of recurring and non-recurring prices and charges for declared transmission services.

3.25 The information sources would come from domestic studies of prices; international benchmarking reports; and prices calculated using route-based pricing models. These sources would together provide a range of prices to compare, inform and confirm the ACCC's considerations, with appropriate regard given to any differences between pricing sources.

ACCC: International benchmarks of Unconditioned Local Loop Service Band 2 charges[9]

3.26 In its decision on Telstra's undertaking in respect of the unconditional local loop service (ULLS), the ACCC made use of international benchmarks to assess whether Telstra's monthly charge was reasonable.

3.27 The ACCC's approach to assessing access pricing was to consider whether the pricing is consistent with legislative criteria and thus:

(a) is based on the cost of providing the service;

(b) does not discriminate in a way which reduces efficient competition in dependent markets;

(c) is not inflated to reduce competition in dependent markets; and

(d) is not predatory.

3.28 When assessing whether the pricing is reasonable, the ACCC relied on international benchmarking as well as other comparators such as the access provider's internal transfer price, the retail price, and cost model estimates.

3.29 The ACCC used information on ULLS monthly charges in other countries provided in consultancy reports. Judgements were made using qualitative review of simple metrics (e.g. comparison tables and averages across countries). The data did not have to be cleaned or adjusted extensively, although some adjustments were made to take account of purchasing power parity and population density.

3.30 In the past the ACCC has placed less weight on international price comparisons due to the difficulty of finding an appropriate comparator for the low population density area of Band 4. However, as the 2008 review focused on Band 2 (with population density more comparable to other countries) the use of comparators was more feasible.

---

[9] ACCC 'Assessment of Telstra's Unconditioned Local Loop Service Band 2 monthly charge undertaking' April 2009 http://www.accc.gov.au/content/item.phtml?itemId=897661&nodeId=08fee6ff657250ab3d6215d37fa253c4&fn=Fn%20177%20-%20ACCC%20Final%20decision%20on%20ULLS.pdf

3.31 The results of the benchmarking exercise revealed significant discrepancies which indicated that Telstra's Proposed Monthly Charge was higher than that required by an efficient operator in other comparable countries to recover costs of supplying a ULLS. The use of international price comparisons also informed the ACCC's assessment of Telstra's underlying costs.

Analysis of approach

Pros

3.32 Comparing the prices of regulated firms with other firms in competitive markets or other jurisdictions can give regulators a good overview as to the reasonableness of the charges, and provide a basis for further and more detailed price regulation if necessary.

3.33 The use of price comparators can also be a useful tool, when comparing or assessing underlying costs or efficiency levels is not feasible due to a lack of detailed information or disproportionately high costs. Information on price levels is usually relatively straightforward to access. Price comparisons can also inform a regulator's assessment of a firm's underlying costs — if other providers are able to achieve a lower price level then their costs may be lower and levels of efficiency higher.

3.34 The use of comparators to set prices directly could be beneficial if the regulator did not think it necessary or feasible to carry out a detailed price review (for example, pegging the prices of small regulated companies to those of larger firms in the sector that are subject to price regulation).

3.35 Price comparisons can serve as an effective form of *ex post* regulation whereby prices are not set directly but monitored in a "lighter-touch" way to ensure that they do not exceed competitive levels.

3.36 Price comparisons can be used to assess whether companies are applying appropriate charging structures. In relation to this, comparing charges and prices for categories of customers can also help a regulator to assess whether regulated firms are undertaking discriminatory charging. This may be particularly useful when prices for certain customers are not regulated and firms may be incentivised to employ price discrimination as a form of cross-subsidisation.

Cons

3.37 Comparing only prices across firms will not take into account a possible range of underlying factors that may differ between firms and across countries. The results of comparisons that only use information on end charges may not therefore be robust.

3.38 In cases where charging structures include a large number of different tariffs, it may be difficult for the regulator to work out what to compare between companies. For instance, if different companies group customers in different ways for tariff purposes and/or apply charges for different things, then it may be difficult to identify like-for-like tariffs to compare

across companies. Even when these problems do not exist, it may be difficult for a regulator to work out whether overall one company is pricing at a higher level than another company, given that some tariffs may be higher and some may be lower. In such circumstances, regulators may wish either to compare total bills for a number of hypothetical customers, or to compare average revenue per customer.

Applicability to Ofwat

3.39 As described above, Ofwat currently makes use of price comparisons to monitor customer charges levied by water companies as part of its annual charges approval process. This provides Ofwat with an overview of the reasonableness of the charges and a basis for challenging companies where charges seem inappropriate. For customers in the tariff basket, this process effectively monitors the *structure* of charges, since the overall level of charges for these customers is determined separately at price reviews.

3.40 The data required for price comparisons are likely to be relatively straightforward to access and use. Most companies are obliged to publish charge structures, avoiding the necessity of requiring complicated reporting frameworks. Indeed, Ofwat's Customer Charges team has suggested that, although the price information it receives through the price approval process is somewhat more detailed than that published by companies, its use of comparators would still be possible were the latter form of information all that was available.

3.41 However, given the wide range of underlying factors that could influence prices, it is likely that the use of price comparisons could only form a part of wider price control processes (such as reasonableness checks), and would not be robust enough to set prices directly. The exception to this might be setting price limits for new appointments and variations (NAVs), where Ofwat compares the existing appointee's charge scheme with the applicant's proposed charges scheme to ensure that customers will not pay a higher price for water and sewerage services on average than they would have done if the existing appointee supplied them.[10]

3.42 In light of potential market reform and possible increasing competition in the contestable sections of the value chain, the use of price comparators could be a useful means of introducing lighter-touch regulation. In particular, once competition had developed sufficiently Ofwat might remove formal price limits for firms operating in these parts of the value chain, but use price comparisons for monitoring purposes. For example, this approach could be applied in the sludge treatment and disposal segment of the value chain if it were to become contestable. Entry of new firms would also increase the number of comparators and could give Ofwat a more comprehensive picture of whether prices charged by incumbents were either excessive or predatory.

---

[10] Ofwat: New Appointments and Variations – a statement of our policy
http://www.ofwat.gov.uk/competition/inset/pap_pos110228navpolicy.pdf

3.43 It may also be that price comparators could become more refined if used for more narrowly defined segments of the supply chain. The less capital-intensive segments of the supply chain may be more conducive to the use of price comparators as there could be fewer underlying factors influencing costs and thus prices. That said, prices in the less capital-intensive parts (e.g. retail) will factor in wholesale prices covering all the upstream costs and thus these underlying factors would still have an influence.

Costs

Description

3.44 A problem that is connected with the general issue of information asymmetry between the regulator and the regulated companies is that of assessing the efficient level of costs that a company should be allowed to recover from its customers.

3.45 Companies are more knowledgeable than regulators about the specific costs they face in their environment but, at the same time, have an incentive to overstate them. By overstating costs and persuading the regulator to set higher price limits, companies can earn higher profits.

3.46 An assessment of an efficient level of costs can be made at the company level during a price review period, or for a specific project.

3.47 Regulators will often make use of comparisons to assess the efficient level of costs and the scope for improvement. Regulators will typically benchmark operating expenditure, capital expenditure or total expenditure. There are two main ways in which comparisons can be used to assess the scope for efficiency improvements in an industry: "bottom-up" approaches and "top-down" approaches. A bottom-up analysis involves consideration of the costs and scope for efficiency improvement in individual processes and in so doing may use process-level benchmarks. By contrast, a top-down analysis considers costs at the firm level and focuses on the total efficiency improvements that have been achieved, or may be expected, in comparator companies (or comparator industries) as a basis for judging the scope for efficiency improvements.

Practical examples

Ofwat: Assessment of capital efficiency[11]

3.48 In PR09, Ofwat assessed the relative catch-up efficiency of each company in the delivery and procurement of capital works through a unit cost benchmarking approach known as the cost base.[12] Ofwat compared domestic company standardised unit cost data against

[11] Setting price limits for 2010-15: Framework and approach
http://www.ofwat.gov.uk/pricereview/pap_pos_pr09method080327.pdf

[12] Ofwat – PR09: Final determinations on price limits; Understanding the costs of delivery and our assumptions for future expenditure
http://www.ofwat.gov.uk/pricereview/pr09phase3/det_pr09_finalchap4.pdf

a fixed cost, to derive assessments of capital efficiency for both maintenance and enhancement expenditure for inclusion in their Capital Expenditure Incentive Scheme (CIS).

3.49 Ofwat engaged specialist consultants both for engineering expertise and for auditing the data. Ensuring that the data were comparable and had been compiled in accordance with the specified information requirements was a significant aspect to this work; and involved a lengthy query process with the companies, resulting in a significant number of data changes for various reasons. To account for regional cost differences in construction prices and salaries, Ofwat made use of information provided to the Office of National Statistics by the Building Cost Information Service (BCIS).

3.50 Whilst gathering more comparative data points from each company could have helped to improve the reliability of the results obtained, this would need to be balanced against an increased regulatory burden. In addition, international comparators and/or comparators from other sectors could also enhance the analysis, although there are issues surrounding data comparability.

3.51 An advantage of this approach is its simplicity, and hence the ease with which companies understood the analysis and could replicate Ofwat's assessments. Ofwat states that the analysis has not only delivered lower bills for customers through challenges to projections of future capital expenditure, but has helped focus company attention on improving their capital procurement processes.

Ofwat: Operating expenditure efficiency analysis[13]

3.52 Ofwat currently makes use of comparators for annual monitoring of water and sewerage companies' relative efficiency on operating expenditure. At PR09, Ofwat used its assessment of efficiency in the base year to calculate the catch-up efficiency rate to be applied to companies' operating expenditure included in price limits.

3.53 This approach used a Corrected Ordinary Least Squares (COLS) model to assess the relative efficiencies of companies' operating expenditure. Ofwat carried out the modelling at a functional level and then each of the models was combined at a service level. The benchmark company for each service is chosen carefully to ensure that, amongst other things, the cost structure of the benchmark company is representative of the industry.

3.54 At the level of the combined model, Ofwat made post-modelling adjustments to ensure consistent comparisons by taking into account differences in operating circumstances that cannot be included in the modelling. These included, for example, atypical costs, regional salaries and opex-capex interactions. In addition, at the combined model stage, Ofwat

[13] Ofwat: Final determinations on price limits, PR09
http://www.ofwat.gov.uk/pricereview/pr09phase3/prs_web_pr09fd

reduced the percentage residuals by 10 per cent for water and by 20 per cent for sewerage to account for the possibility of stochastic error.

3.55 The models used company data collected through the June returns in order to carry out the relative efficiency modelling. Ofwat spent a considerable amount of time querying companies in order to clean the data. The quality of the data is very important, because the inclusion of a company as a benchmark will affect all the other companies' relative efficiency results; therefore, the inclusion of poor data will potentially skew all the results. To this end, Ofwat has criteria that a company must satisfy in order for it to be used as a benchmark company.

3.56 The use of regression techniques for comparative analysis of operating expenditure efficiency is useful because it allows Ofwat to make a quantitative assessment of the scope of efficiency gains that can be achieved by water and sewerage companies. The use of comparisons in this context also provides companies with an incentive to efficiently manage their operating expenditure.

Ofgem: Comparative benchmarking of network investment and operational costs[14]

3.57 As part of the Electricity Distribution Price Control Review 5 (DPCR5), Ofgem assessed the efficient level of network investment and operational costs for April 2010 to March 2015. The approach to cost assessment consisted of four steps:

- review the distribution network operators' (DNOs') forecasts;
- carry out modelling and benchmarking work;
- consider evidence on why the DNOs' forecast volumes or costs differ from Ofgem's benchmarks; and
- form an overall view on the appropriate baseline level of costs from DPCR5, taking this and wider evidence into account.

3.58 Ofgem performed different cost analysis for network investment and operational activity costs and ran a range of time series regressions for Operational Costs, using four years' data which allowed more reliable estimates of efficiency. Ofgem benchmarked asset replacement unit costs, indirect costs[15] and network operating costs separately. Ofgem considered the specific data variability of the data for each of these costs in setting the

---

[14] Electricity Distribution Price Control Review Final Proposals - Allowed revenue - Cost assessment, Decision Document, December 2009 http://www.ofgem.gov.uk/Networks/ElecDist/PriceCntrls/DPCR5/Documents1/FP_3_Cost%20Assessment%20with%20SS%20comments.pdf

[15] As noted in Ofgem's Electricity Distribution Price Control Review Final Proposals, indirect costs include "indirect closely associated with network costs" and business support. http://www.ofgem.gov.uk/Networks/ElecDist/PriceCntrls/DPCR5/Documents1/FP_3_Cost%20Assessment%20with%20SS%20comments.pdf)

benchmark. For example, when benchmarking asset replacement unit costs, an adjusted median was used, whereas network operating costs were benchmarked using the upper third. Ofgem allowed the DNOs to remove costs from the general unit cost analysis where they could justify them as being atypical or costs associated with work which is not carried out by other DNOs. Additionally, Ofgem had to make adjustments where there were boundary issues between separately defined unit costs. Large projects (i.e. exceeding £15m) were reviewed separately.

3.59 Ofgem performed sense checks using previous DNO forecasts and their actual performance, and broader information on the quality of the data provided. After four years of annual regulatory reporting and adaptations made to the business plan questionnaires, the data Ofgem receives are now more robust. Ofgem reached its final decisions after several rounds of interaction with the DNOs and other stakeholders, and placed a high degree of confidence in the results of its benchmarking.

ORR: International cost efficiency benchmarking of Network Rail[16]

3.60 Since Network Rail is a single national monopoly, ORR benchmarks the cost efficiency of Network Rail against international comparators, predominantly made up of west European rail infrastructure managers. The assessment is used to establish the levels of access charges at periodic reviews, and, as such, it is a key part of ORR's regulatory work.

3.61 The ORR conducts two complementary types of efficiency analysis: top-down econometric analysis and bottom-up engineering based analysis. The ORR uses the bottom-up work as a cross-check and to better understand the "efficiency gap" calculated using the top-down approach. The regression analysis compares total expenditure (maintenance and renewal costs) since there are some boundary issues between opex and capex in the rail industry definitions. Comparing total expenditure allows for international comparisons to be made.

3.62 The dataset used for the econometric analysis is the "lasting infrastructure cost benchmarking" (LICB) dataset sourced from the International Union of Railways, which covers 14 European rail infrastructure managers from 1996 to 2008. Since all the data are from one source, the data are in a common format, so no major adjustments are necessary. The ORR cross-checks the data from year to year, to ensure there are no human inputting errors. The ORR is confident in the dataset which allows it to place a large weight on the results obtained.

3.63 The econometric modelling results are dependent on the specific modelling assumptions, as well as the quality and comparability of the data. ORR chose Stochastic Frontier

[16] International cost efficiency benchmarking of Network Rail, September 2010
http://www.rail-reg.gov.uk/upload/pdf/econometric_update_2010_orr_benchmarking_report.pdf

Analysis (SFA) as the main technique to compare efficiency as it allows the best treatment of the wide variety of comparators. ORR conducts Data Envelopment Analysis (DEA) and Total Factor Productivity (TFP) cross-checks on the results of the SFA using the same international dataset. ORR also does some crude cross-checks using unit cost opex on a sub-set of the international comparators.

The Office of Energy Regulation (Energiekamer): Assessment of factors that may cause regional differences in costs[17]

3.64 The Dutch energy regulator commissioned work to investigate whether there were any factors which might cause regional differences in costs among gas and electricity distribution network companies. The regulator considered whether it was possible to measure the potential cost impact of any such factor in an objective and reliable way, and, where this was the case, the potential cost of the factor was estimated.

3.65 The regulator analysed data from 10 electricity companies and 12 gas companies. Companies agreed upon a list of possible factors and to provide data that were reviewed by independent auditors. Each company's reported average costs of the regional difference factor over the period 2000-2003 was calculated and expressed as a proportion of each company's standardised costs. Calculating average costs over the whole 2000-2003 period is a way of smoothing the variation in costs over time. The regulator also adjusted the data for inflation. Both opex and capex were considered. Costs were compared as a percentage of the company's standardised costs.

3.66 The regulator undertook regression analysis on some of the factors which might cause regional differences in costs. However, some of the auditors expressed concerns about the company data, and data which did not receive sufficient endorsement from the auditors were excluded from the analysis. This, coupled with companies failing to comply with the data requests, proved to be a problem for the regression analysis, since there was insufficient data for the analysis to be reliable.

3.67 As a cross-check, the regulator conducted "bottom-up" analysis for some regional differences. Cost information was provided by the companies to an external consultancy on the understanding that the data would remain confidential.

3.68 The regulator found that it was not possible to measure some costs objectively or reliably because they were so small and varied over time, which meant that it was difficult to determine whether the differences among companies reflected differences in management efficiency or significant underlying cost differences. Such costs included those associated with consumer write-offs and the diversion of cables or pipes to accommodate road works.

---

[17] Regional Differences in Gas and Electricity Companies, March 2006
http://www.energiekamer.nl/images/Addendum%20%20E%20Method%20Decision%20RNB%20E%20X-factor%20102106-89_tcm7-94489.pdf

Analysis of approach

Pros

3.69 The principal advantage of making cost comparisons in order to assess the efficient level of costs for a firm or an industry, is that it allows the regulator to form a view on the scope for efficiency improvements. The regulator can therefore introduce schemes within the price control, to incentivise firms to improve their performance relative to cost benchmarks which are realistic.

3.70 An advantage of top-down benchmarking is that a range of technical tools (such as statistical analysis and linear programming) is available and the results obtained from the analysis can be audited by external experts. An advantage of the "bottom-up" approach – that allows specific processes to be benchmarked – is that it has the potential to allow inter-industry comparisons, which may improve the number of comparators and therefore the reliability of the results. In a firm that conducts many processes, the bottom-up approach can help to ensure that the firm addresses efficiency across all its processes.

Cons

3.71 Although cost benchmarking is a common practice among regulators, it can be difficult to find appropriate comparators in single-firm regulated industries. In this case it may be necessary to make use of international comparisons, which can be problematic because firms in different countries may operate under different environmental conditions - making the specificities of the operating environment difficult to control in the benchmarking exercise.

3.72 Comparisons made across companies using bottom-up cost modelling are complicated where there are regional differences between companies and/or assets are non-standardised.

3.73 In the case of top-down approaches to cost benchmarking, firms have an incentive to overstate their costs in order to inflate the benchmark. This could be so cost-cutting measures never have to be achieved, or to make it easier for the firm to realise efficiency savings and reap the benefits of any cost-incentive structure in place. Where the top-down approach is used to compare firms within the same industry, this can allow for industry-wide inefficiencies to be perpetuated.

Applicability to Ofwat

3.74 A monopolist that is not subject to the threat of new entry may have limited incentives to reduce costs and pass these savings through to customers, so in this case cost benchmarking can be used to align the incentives of the firm with that of the customer. With regard to the contestable parts of the market, the new entry of firms, or the threat of new entry, should be sufficient to incentivise opex and capex efficiency by the incumbent firm, which would remove the need to use comparators in order to assess the scope for efficiency improvements. This is, however, only if the market is suitably contestable, so

that there is sufficient entry in these markets to generate the necessary competitive forces so that the market provides these incentives. Where there is uncertainty about the true contestability of the market, continued cost benchmarking could be appropriate at least for a transitional period, and entry into these markets would provide Ofwat with additional comparators which would make any cost comparisons more robust.

3.75 Given that there is unlikely to be entry in the network stage of the value chain, it is likely still to be necessary to make cost comparisons between regional networks in order to assess the scope for efficiency improvements and therefore create incentives for opex and capex efficiency.

3.76 If deregulation of water resources and sludge treatment and disposal were to take place, competitive forces in these parts of the value chain may mean cost benchmarking by Ofwat is not necessary. However, if there is not sufficient entry to generate the necessary competitive forces in these parts of the value chain, Ofwat may need to continue to carry out cost benchmarking exercises in order to create appropriate incentives for cost efficiency in these sectors. Separate price controls for the resource business would have the benefit of encouraging the creation and separate incentivisation of a resources business unit distinct from the network plus business unit. In this case, if there are different degrees of development of competition in different stages of the value chain, Ofwat could make use of cost comparisons to apply incentives with different degrees of power to reflect the extent to which different parts of the value chain need to be incentivised. Under a global "wholesale" price control, Ofwat could still carry out cost comparisons at the resource level in order to feed into the specific incentive scheme focused on more efficient water provision.

3.77 Cost comparisons could be carried out separately for the system operation functions in order to assess the scope for efficiency improvements with regard to system operation. However, initially the use of comparisons may be difficult as there would be no historic basis on which to assess cost efficiency, and it may be difficult to determine which factors should be controlled for in any benchmarking exercise.

Quality of Service

Description

3.78 Comparisons of quality of service can help regulators address the problem arising under incentive regulation, whereby regulated companies may have an incentive to reduce their costs at the expense of the quality of service they provide to their customers. In particular, if regulators introduce price limits without any requirements on the quality of service, companies may be able to achieve higher profits within these price limits if they reduce the quality of service they provide. This is a particular problem in those parts of the value chain where competition is unlikely to be possible and customers cannot switch to an alternative provider.

3.79 Quality benchmarking can be problematic for regulators to undertake because quality is a multi-faceted concept, and therefore benchmarking one single aspect of quality may lead firms to reduce levels of quality for other quality features not considered in the regulatory process. If the quality of a service can be reasonably well approximated by very few features, then regulators can assess these features separately; otherwise, some aggregation into a quality index might be preferred (although it may be difficult to choose a correct weighting scheme).

3.80 Although regulators have in general treated quality and cost benchmarking separately, in reality they are jointly determined by firms, given the trade-offs that there often are between cost and quality. This suggests that a joint treatment of costs and quality might also be considered as a potential approach. For example, an index of quality might be considered as an additional output variable and included in cost benchmarking procedures. (This approach is considered in more detail under the heading "Some Combinations of the Above", page 66.)

Practical examples

Ofwat: The Overall Performance Assessment (OPA) and Service Incentive Mechanism (SIM)[18]

3.81 Ofwat previously used the Overall Performance Assessment (OPA) to measure and incentivise good service to consumers. The OPA allowed Ofwat to compare the quality of the overall service the companies provide, and it also provided consumers with information on how their local water company was performing when compared with others across a range of specific measures. Ofwat used the OPA to take account of relative performance when setting limits on the prices the companies charge customers through their water bills.

3.82 The OPA made use of data on company performance. The key areas and contributing measures included were:

(a) water supply (low water pressure, unplanned interruptions to supply, and drinking water quality);

(b) security of supply (hosepipe restrictions, leakage, and performance against Ofwat's security of supply index);

(c) sewerage service (sewer flooding incidents and risk of sewer flooding);

(d) consumer service (written complaints, billing contacts, billing metered consumers, telephone answering, telephone access, services to consumers with special needs,

[18] Ofwat: Service and Delivery – performance of the water companies in England and Wales 2009-10 http://www.ofwat.gov.uk/regulating/reporting/rpt_los_2009-10.pdf

supply pipe repair policies, debt and revenue policies, complaint handling, compensation, and provision of information to consumers); and

(e) environmental impact (sewage treatment works, pollution incidents from water and sewerage activities, and sludge disposal).

3.83 Since April 2010, Ofwat has been using the Service Incentive Mechanism (SIM) which comprises:

(a) a quantitative indicator that measures complaints and unwanted contacts; and

(b) a qualitative indicator that measures how satisfied customers are with the quality of service they receive, based on a survey of consumers who have had direct contact with their water company.

3.84 The quantitative measure is a new approach, which has meant a change in the data that Ofwat collects. As with the OPA, Ofwat may publish league tables setting out information about performance against the new measures, allowing consumers and other stakeholders to identify those companies that offer the best and worst levels of service.

Ofgem: Quality of Service Scorecard for Gas Distribution Networks

3.85 Ofgem collates and publishes quality of service information for Gas Distribution Networks (GDNs) in the form of a "balanced score card". This allows Ofgem to make comparisons of performance between GDNs. It focuses on the performance of GDNs across a number of key areas, and those measures which are most valuable to consumers and to GDNs.

3.86 The score card contains information for the following indicators:[19]

(a) gas supply – number of unplanned interruptions per 100 customers, average duration of interruptions, and accuracy of data submitted;

(b) gas safety – per cent of gas emergencies attended within prescribed timescales;

(c) accuracy of pipe-line records – number of undigitised mains pipe-line records;

(d) customer service – customer satisfaction survey results for repair, replacement, emergencies and connections;

(e) complaints – per cent of complaints responded to within prescribed timescales; and

[19] Ofgem, Gas Distribution Price Control Review, Final Proposals, 2007

(f) reinstatement – per cent of reinstatement jobs completed within prescribed timescales.

3.87 The different areas are not weighted to create an overall performance score for GDNs and there is no financial incentive attached to this measure.

Ofgem: Gas Distribution Networks Discretionary Reward Scheme[20]

3.88 In addition to the balanced score card, Ofgem also has a discretionary reward scheme for GDNs. The aim of the discretionary reward scheme is to encourage and drive performance in areas that cannot be easily measured or incentivised through more mechanistic regimes. The scheme has a maximum total annual reward of £4 million available across all eight GDNs and will cover three areas:

(a) initiatives which reduce the environmental impact of gas distribution, including those that reduce gas that is consumed within or lost from a transporter's system (shrinkage) but which may not be rewarded through the shrinkage incentive and those that improve the measurement of shrinkage;

(b) initiatives which facilitate network extensions, particularly those that increase the affordability of network extensions for fuel-poor consumers; and

(c) schemes to promote gas safety, including awareness of carbon monoxide.

3.89 Ofgem compares submissions from GDNs in order to assess how to allocate the funding available under the discretionary reward scheme. For each of the three areas covered by the reward scheme, Ofgem has specified a number of minimum requirements which must be met by all submissions. Only those applications that meet all of the minimum requirements are eligible for a reward. Ofgem provides GDNs with guidance on the format of the submissions.

Ofcom: Comparing the service of internet service providers

3.90 Ofcom commissioned research in 2008 and 2009 to understand the performance of UK fixed-line residential broadband connections in order to ensure that consumers have the clearest possible information about broadband services.[21]

3.91 The focus of the report is on average download speed and how this varies by a range of variables, including geographical location, time of day, access technology and ISP package. The report presents the findings from the research which involved the collection and interpretation of over 18 million data points. Ofcom included comparative data for

---

[20] Ofgem: Decision report for 2009.10 Gas Discretionary Reward Scheme
http://www.ofgem.gov.uk/Pages/MoreInformation.aspx?docid=250&refer=Networks/GasDistr/QoS

[21] Ofcom, UK broadband speeds, May 2010: The performance of fixed-line broadband delivered to UK residential consumers
http://stakeholders.ofcom.org.uk/binaries/research/telecoms-research/bbspeeds2010/bbspeeds2010.pdf

those Internet Service Provider (ISP) packages for which sample size was large enough to make the analysis statistically meaningful.

3.92 Ofcom used statistical techniques to adjust the results to ensure that they are representative of the UK broadband population as a whole. This included weighting the results by rural/urban, geographic market definition and ISP. For the provider-specific comparisons, Ofcom normalised the data for DSL operators by distance from exchange; this was necessary in order to provide like-for-like comparisons of ISPs who have different customer profiles. The weightings applied were also validated by a market research company.

National Water Commission, Australia: National Performance Report[22]

3.93 The National Water Commission (NWC) produces annual performance reports comparing service quality (amongst other things) for urban water utilities and rural water service providers. Urban and rural water service providers are considered separately due to the differences in the nature of urban and rural water industries. Different performance-reporting models apply to urban and rural water delivery agencies.

3.94 The annual performance report for urban water companies contains data from 73 utilities from every State and Territory in Australia. The report presents comparative tables and charts with accompanying commentary and analysis. With regard to quality of service, the following indicators are considered:

(a) average duration of an unplanned interruption (minutes);

(b) total water and sewerage complaints (per 1,000 properties); and

(c) per cent of calls answered by an operator within 30 seconds (%).

3.95 Ensuring the integrity of data in the National Performance Report is considered by the NWC to be an essential element of the benchmarking process. To ensure that stringent data quality procedures and processes can be met, data contained in the report are "locked down" in November. In the event that data are subsequently found to be erroneous, the incorrect data are denoted with an asterisk, and the correct figures are reported in an erratum section of the report.

3.96 The annual performance report for rural water companies publishes comprehensive data for 12 rural water service providers across Australia. The threshold for including a rural water service provider is that the additional recurrent costs incurred by that organisation in relation to data collection, reporting and required audits are less than 1 per cent of the total revenue associated with the provision of rural water services. Where the recurrent

[22] NWC, National Performance Report
http://www.nwc.gov.au/www/html/2765-national-performance-report-2008-09---urban-water-utilities.asp?intSiteID=1

costs of reporting exceed this threshold, rural water service providers are not required to report; however, they are encouraged to do so in the interests of industry transparency.

3.97 Unlike the urban report which provides comparative tables as well as individual reports for each utility, the rural report only provides reports on individual company performance. With regard to quality of service, the following indicators are considered:

(a) water delivery as ordered;

(b) timeliness of gravity stock and domestic delivery;

(c) unavailability of pressurised stock and domestic network supply service;

(d) availability of surface drainage service;

(e) availability of sub-surface drainage service;

(f) rural water service delivery complaints;

(g) customer billing and account complaints; and

(h) total customer complaints.

Australian Energy Regulator: Victorian Gas Distribution Business Comparative Performance[23]

3.98 The Australian Energy Regulator (AER) produces a report which details the performance of the three gas distribution network service providers (DNSPs) in Victoria: Envestra, Multinet and SP AusNet. The report allows the quality of gas supply to be compared between the Victorian DNSPs. The report considers indicators related to the reliability of supply and customer service.

3.99 The purpose of these comparisons is to encourage competition between gas DNSPs by providing an incentive for DNSPs to improve performance relative to one another, and to provide customers with information about the services they are receiving.

3.100 Reliability of supply is a measure of the level of availability of gas supply to customers. The report considers performance indicators for the average customer's time off-supply, interruption frequency, number of outages on the supply network, and major supply interruption events. In reviewing gas supply reliability, AER looks at trends in performance over a period of time to take into account the fact that there can be significant short-term variations in reliability measures that are not directly related to changes in the condition of the gas supply network.

---

[23] AER, Victorian Gas Distribution Business Comparative Performance Report 2008 http://www.aer.gov.au/content/item.phtml?itemId=736841&nodeId=9757a716e48b9cbc22aa66d1f597d4b2&fn=Victorian%20DNSP%20gas%20comparative%20performance%20report.pdf

3.101 The levels of customer service achieved by the DNSPs are measured by:

(a) DNSPs' performance in responding to customer calls about serious incidents;

(b) meeting customers' appointments on time;

(c) making supply connections;

(d) maintaining supply reliability above the minimum reliability level; and

(e) the proportion of complaints received by the DNSPs, and received for full investigation by the Energy and Water Ombudsman (Victoria) (EWOV).

3.102 This comparative performance report is based on information provided by the DNSPs on network performance and customer-service statistics; and complaint information supplied by the Energy and Water Ombudsman (Victoria) (EWOV). All gas DNSPs are required to undertake an independent compliance audit in accordance with the Essential Services Commission of Victoria's (ESCV) Gas Industry Guideline. The audit report, prepared by the AER, concluded that overall businesses achieved a ±5 per cent or better accuracy with regard to the service performance indicators, which was deemed to be a reasonable level of accuracy by the AER.

Analysis of approach

Pros

3.103 A principal advantage of the use of comparators in this context is that it can help overcome the information asymmetry that exists between the regulator and the companies on the attainable quality of service and the costs of providing it.

3.104 Price limits often include incentive schemes for quality of service to provide firms with an incentive not to reduce their quality of service in order to achieve efficiency savings. An advantage of using comparators to provide incentives for quality of service, is that it allows incentives to be created for elements of quality for which the regulator does not have a robust view on what represents a good absolute level of performance. Incentive schemes based on relative quality of service can also be effective in isolating poor performers and encouraging these firms to adopt best practice.

3.105 This approach may be particularly useful in the context of a change in the framework because the regulator may not necessarily be aware of what a good quality score is when new quality measures are first implemented. Comparisons of quality of service can also be seen as imitating a competitive market better than absolute measures of quality of service, since in competitive markets quality will often be one of the dimensions on which firms compete with each other.

Cons

3.106 A difficulty that arises when using comparisons for quality of service is because quality is a multi-faceted concept. Therefore, it may be difficult for the regulator to identify the most important aspects of quality that should be compared; and what weighting, i.e. the level of importance, should be applied to each aspect. If comparisons include relatively unimportant aspects of quality or comparisons do not include important aspects of quality, the comparisons could end up distorting the firms' behaviour, which could potentially lead to worse outcomes for consumers. This problem could also arise if the regulator applies weights to different quality aspects which do not reflect consumer preferences.

3.107 Another disadvantage which may arise is that there may be less of an incentive for regulated firms to outperform the relative quality of service standard that must be achieved. Over-performance could lead to an upward adjustment of the benchmarked quality of service standard which would increase costs for the firm.

3.108 The way in which quality is measured may also lead to distorted behaviour as firms respond to the incentive scheme in ways which improve the measure of performance without necessarily improving underlying quality. For example, a measure of how many site visits happen within a certain number of days of a customer phoning to book a visit, may mean that when firms cannot book a visit within this timeframe they ask the consumer to phone back another time.

Applicability to Ofwat

3.109 As described above, Ofwat currently has a framework in place for the use of comparators with regard to quality of service in the form of the Service Incentive Mechanism (SIM) (and it previously used the Overall Performance Assessment). This framework allows Ofwat to make use of comparisons for elements of quality for which they do not have a robust view on what represents an absolute level of performance. The SIM provides reputational incentives to firms (and financial incentives in the form of price limit adjustments based on performance) and it also provides consumers with information on how their local water company is performing when compared with others in terms of quality of service.

3.110 The multi-dimensional nature of quality of service may mean that data are needed on a range of variables. These variables need to be measured in the same way by all the firms involved in order for the comparisons to be meaningful. It is important to capture the right variables to prevent firms from reducing the level of quality they provide on features that are not considered in the process. In particular, it is necessary to measure performance against quality criteria that are important, and that the appropriate weighting is applied to these criteria. This may involve, for example, customer surveys to establish what aspects of quality are most important to consumers. It is also important to balance the regulatory burden of information provision against the value that is placed on incremental quality of service improvements.

3.111 If implemented correctly, comparisons of quality of service can provide the regulator with information on attainable quality of service and the costs of providing this standard of service. Information on relative quality of service can also help the regulator to establish industry best practice. Quality of service comparisons are particularly useful when the regulator wishes to create incentives to improve standards for elements of quality for which the regulator does not have a robust view on what represents a good absolute level of performance.

3.112 In the context of potential market reform, quality of service comparisons will continue to be a valuable approach to providing incentives to companies to improve their service standards whether they are employed in separate price controls or a global "wholesale" price control. If separate price controls are introduced, relative quality of service incentive schemes would help Ofwat to establish what levels of quality of service are attainable at different stages of the value chain, provided there are enough comparators. Similarly, comparing levels of quality of service will also be a useful approach for the system operation functions within the network plus business.

3.113 In addition, this is a useful transitional tool as competition develops in different stages of the value chain because comparisons can also be seen as imitating a competitive market, since in competitive markets firms will compete with each other on quality dimensions as well as other aspects such as price. Comparisons of quality of service may also be useful if the regulatory framework moves to one which is outcomes-based.

Security of Supply

Description

3.114 At the most generic level, security of supply refers to the ability to continue to supply customers in the future, even if unforeseen events were to occur. When a commodity is being provided over a network (as in the gas, electricity and water sectors), security of supply has at least two aspects:

(a) a sufficient supply of the commodity being transported over the network to ensure that customer demand can be met; and

(b) sufficient capacity in the network to ensure that the commodity can be delivered to customers.

3.115 In the water sector, the term "security of supply" is generally used in relation to the first of these aspects (i.e. a sufficient supply of water relative to demand), although network capacity is also referred to (for example, supply interruptions were included in the Overall Performance Assessment).

3.116 In any sector, measuring security of supply will typically involve projecting future demand and supply, and assessing whether there is sufficient "headroom" in future supply to ensure demand can continue to be met even in the event of unexpected developments that temporarily reduce the level of supply. For example, in the water sector companies

plan to meet a given level of service such as a one in ten year hosepipe ban. These levels of service are specific to individual companies.

3.117 A potential supply-demand deficit can arise for a number of reasons, including growth in demand or sources of supply reaching the end of their useful life. Where a supply-demand deficit is predicted in the future, actions can be taken to resolve the issue either on the supply side (e.g. investment in new sources of supply; or schemes to use existing sources more efficiently) or on the demand side (e.g. demand reduction schemes).

3.118 Comparators can be used to assess firms' performance with regard to security of supply. On the supply side, this might involve comparisons of leakage performance between firms or comparisons of investment plans to meet predicted future demand. On the demand side, the regulator may, for example, make comparisons between firms' demand management programmes.

Practical examples

Ofwat: Annual leakage performance and water efficiency

3.119 The water companies calculate their sustainable economic levels of leakage (SELLs) and propose a leakage target. If Ofwat agrees then the SELL becomes the leakage target. Ofwat assesses the consistency of companies' annual leakage reporting with respect to annual leakage performance, in order to ensure that the way in which companies report leakage performance is consistent with how they derive their SELLs. By comparing leakage reporting between companies and over time, Ofwat assesses how reliable certain components of the water balance are, and also whether companies are using appropriate assumptions in defining and measuring their leakage targets.

3.120 Ofwat also uses comparators for other aspects of security of supply, such as comparing neighbouring companies' per capita consumption to verify that other components in the company's water balance are realistic.

3.121 Ofwat does not routinely compare leakage performance (either between companies or internationally), but does monitor SELLs to ensure that each company's leakage performance is efficient in the context of its own specific economic conditions. For some areas Ofwat uses data from other sectors for example, in its cost-benefit models of metering, Ofwat has used information from the energy sector on the financial and carbon costs of saving hot water.

3.122 Companies provide data relating to water efficiency (yield, costs and consumer engagement) for collation and analysis in the Waterwise Evidence. Evidence Base reports are published on the Waterwise website. This evidence base will help inform Ofwat's assumptions about water savings which are used in water efficiency targets. The main aim of the evidence base, however, is to provide a better understanding of the cost and effectiveness of water efficiency interventions to help water companies choose the optimal approach to balancing supply and demand.

3.123 The comparators are used either to make qualitative comparisons or to compare simple metrics (e.g. unit costs). A minimal amount of data cleaning is required, and Ofwat does very little in the way of adjusting or normalising the data.

3.124 Ofwat makes use of Reporters[24] to check companies' figures and estimates to highlight any anomalies. This enables Ofwat to assess how reliable the data are and thus identify the extent to which it can be confident in using them.

3.125 The use of comparators in this area allows Ofwat to improve its judgement on companies' claims, and enables Ofwat to take an overarching view on the costs of maintaining a supply-demand balance. It also informs Ofwat policy. In particular, the use of comparators (predominantly within-company comparators over time) has enabled Ofwat to monitor more effectively how companies perform against their leakage targets.

3.126 Some of the data used by Ofwat in its comparisons are provided through evidence from company commentaries,[25] although these data must be corroborated by official sources for Ofwat to be able to use them in regulatory decisions. The loss of these commentaries will thus have some impact on the use of the data. For example, the data will be of less use if Ofwat is not informed of how the methodology used by the company in deriving them has changed over time.

3.127 Ofwat also considers evidence as one source of evidence on which it makes "local" comparisons (i.e. information from neighbouring companies), such as judging whether extreme weather has contributed to a company's failure to meet its leakage target. However, as mentioned, this evidence would be confirmed against official sources, and Ofwat is unlikely to be solely reliant on the company as a source of information.

Ofwat: Sewerage – supply/demand balance

3.128 As part of PR09, Ofwat made use of comparator information related to the provision of sewage treatment capacity to meet demand. It also used comparator information in assessing the costs that Ofwat could expect companies to recover from third parties such as house builders. With regard to sewer flooding, Ofwat considered using an assessment between companies for sewer flooding, but in the end focussed on allowing all schemes that were cost beneficial because of the high importance that customers placed on this area.

3.129 Ofwat used a relative unit cost analysis for increasing sewage treatment capacity across the industry for three different sized groups of treatment works. Ofwat allowed unit costs to vary from the industry average according to the strength of companies' plans. No unit

---

[24] Ofwat requires each water company in England and Wales to appoint an independent professional (Reporter) to examine, test and give an opinion on the regulatory information provided by the company to Ofwat.

[25] This is being reviewed by Ofwat as part of its review of regulatory compliance

cost was allowed to vary by more than 50 per cent. Ofwat considered this relatively straightforward and no data cleansing was required.

3.130 With regard to sewerage supply demand, Ofwat examined company data on unit costs of providing capacity and capped future unit costs at past unit costs unless there was sufficient evidence to support changes in costs. However, in this case comparisons were made within companies as opposed to across companies. The availability of company information over time is an important input for Ofwat in setting a baseline of costs for the delivery of capacity for each company. Although the data were used mechanistically they did require a significant amount of cleaning.

Australian Energy Regulator: Reliability of Supply

3.131 The Australian Energy Regulator (AER) publishes a Comparative Performance Report for the three gas distribution network service providers (DNSPs) in Victoria: Envestra, Multinet and SP AusNet. This report allows the comparison of, among other things, network reliability and quality of gas supply of the three DNSPs.[26]

3.132 Comparison of a number of key performance indicators are made between the three DNSPs:

(a) planned and unplanned supply interruption (frequency per customer and duration);

(b) number of reported and repaired gas leaks;

(c) mains damage (incidents per customer and incident per km of distribution mains).

3.133 Comparisons are made through the use of simple metrics and qualitative review. The data are received from a number of sources, including company regulatory accounts, company information on network performance, and information from external organisations such as Energy Safe Victoria and the Energy and Water Ombudsman. Changes in the way these key performance indicators have been measured over time has reduced the AER's ability to make comparisons over time.

3.134 The comparability of the data are also influenced by the way in which they are collected. For example, DNSPs carry out leakage surveys to identify and repair leaks. There is sufficient variation in the surveys across DSNPs to mean that the data collected have little comparative value.

3.135 The aim of collecting and publishing data on comparators is to stimulate competition between the gas DNSPs and provide them with an incentive to improve their performance

[26] AER (2010): 'Victorian Gas Distribution Business Comparative Performance Report 2008' http://www.aer.gov.au/content/item.phtml?itemId=736841&nodeId=9757a716e48b9cbc22aa66d1f597d4b2&fn=Victorian%20DNSP%20gas%20comparative%20performance%20report.pdf

relative to one another, as well as to provide customers with information about the services they are receiving.

Analysis of approach

Pros

3.136 Comparing companies' performance with regard to security of supply by, for example, by comparing leakage performance or water efficiency across companies, can allow the regulator to introduce incentive schemes to encourage better performance and therefore reduce the likelihood of supply-demand deficits.

3.137 The use of comparators also allows the regulator to assess what represents a good absolute level of performance for specific aspects of security of supply. For example, the optimal leakage level will not be zero because the cost of reducing leakage to zero is likely to outweigh the benefits. Comparisons of leakage performance can allow the regulator to form a view on the extent to which leakage levels can be reduced, although sustainable economic levels of leakage will vary across companies.

3.138 Regulated companies will typically have more information than the regulator with regard to what investments are needed to reduce or avoid supply-demand deficits, and the costs of these investments. As such, firms may have an incentive to over-estimate capex requirements, allowing them to benefit from under-spending their capex allowances once the price control has been set. The use of comparators may alleviate this problem to some extent by providing the regulator with an indication of the relative need for investments to ensure security of supply, and the efficient cost of these investments.

3.139 Companies will also have more information than the regulator about some of the factors influencing supply security (such as leakage), and where they are left to define and measure these factors the use of comparisons (particularly within each company over time) can help the regulator assess whether the assumptions companies use are appropriate and consistent.

Cons

3.140 Although comparisons of companies' investment plans with regard to ensuring security of supply may provide the regulator with information on the relative need for, and cost of, these investments, it may be difficult to make these comparisons because of idiosyncrasies in the nature of the investments.

3.141 If the regulator's aim is to promote cost efficiency among firms, then the use of comparators for a limited range of security of supply indicators (e.g. just for leakage) can create distorted incentives for companies to reduce costs in these areas in preference to reducing other costs, which could lead to less efficient overall business plans.

3.142 As an example of this, if comparisons are used to underpin demand management incentive schemes, there is a risk that firms may be encouraged to implement demand

management schemes even if supply-side investments may be more cost efficient. The converse may be true if comparisons are made in a way which promotes supply-side solutions (e.g. if inadequate account were to be taken of the potential impact of demand management schemes when projecting the future supply-demand balance).

3.143 Regulators that collect comparative data by means of performance indicators may be at a disadvantage where these indicators are designed and measured externally (e.g. through another government department). Changes in the structure of indicators will reduce the comparability of the data over time, and regulators will need to be aware of such changes when they occur. Comparison of data over time may be particularly important for security of supply issues, as these are related to changes in factors that also change over time, such as demand, population growth, or weather patterns.

Applicability to Ofwat

3.144 Ofwat currently makes use of comparators to ensure security of supply, such as to monitor annual leakage performance between companies and to verify companies' claims with regard to the demand and supply of water. Ofwat uses comparators for other aspects of security of supply, such as comparing neighbouring companies' *per capita* consumption to verify that other components in the company's water balance are realistic.

3.145 Ofwat also compared performance against security of supply targets as part of the Overall Performance Assessment.

3.146 Security of supply will relate to both supply-side and demand-side management. Therefore, data are required on a range of variables and these variables need to be measured and presented consistently by all the companies in order for comparisons to be meaningful. For example, when monitoring annual leakage performance, Ofwat uses comparators to assess how reliable certain components of the water balance are, and this helps Ofwat to decide whether companies report leakage in a way that is consistent.

3.147 The use of comparators can provide Ofwat with information on potential supply-demand deficits and the costs of avoiding these deficits. Comparisons of elements of security of supply can also help to identify industry best practice, and implement incentive schemes to encourage all firms to move towards this level of best practice.

3.148 Potential market reforms imply that market prices might play a role in guaranteeing security of supply, in place of (or alongside) current forward planning processes. In particular, in a competitive market, prices would be expected to rise when the commodity is in short supply thus stimulating additional supply and giving customers an incentive to reduce demand.

3.149 Ofwat may still need to make use of incentive schemes for firms in the contestable parts of the value chain to promote the efficient management of supply and demand. Comparators may be particularly useful to help Ofwat assess how the management of security of supply has changed across firms with the development of competition, and to determine appropriate measures that take account of these changes.

3.150 If competition does not develop sufficiently in the contestable parts of the value chain, comparisons could still be used as a means to scrutinise companies' business plans with regard to the capex required to ensure security of supply. Comparisons could still be used in this way whether separate price controls for resources and network plus are introduced, or if a global "wholesale" price control is introduced.

3.151 However, the system operation functions within the network plus business could potentially change the way in which comparisons related to security of supply are used. The system operator functions include balancing supply and demand of water on the system and long-term planning and investment co-ordination. This could be seen as analogous to "central despatch" in the electricity sector (the system in place in the UK in the early years following electricity privatisation), whereby the System Operator (SO) alone is responsible for the balancing of supply and demand. In this context, it may be useful to compare the ways in which the system operation functions in each network plus business unit optimise the network, and how long-term planning and investment co-ordination is undertaken to ensure security of supply. For example, comparisons could be used to provide financial incentives to minimise the costs of maintaining balance.

3.152 An alternative model to that proposed in the Ofwat's preliminary model for potential market reform, would be to incentivise water suppliers to contract with upstream companies for water used by their customers in the first instance. Under this model, the system operator functions are to carry out residual balancing (the current market arrangements in the GB electricity sector) whereby the system operator maintains the balance between supply and demand to the extent that this balance is not, or is not expected to be, maintained by suppliers' own actions. In this case, Ofwat might compare the prices at which companies take residual balancing actions and the number of residual balancing trades undertaken, in order to assist with the design of incentives. Comparisons could be valuable in this instance to inform the design of system operator incentives, particularly given the lack of historical data on these functions.

3.153 Under a residual balancing approach where water suppliers balance supply and demand in the first instance, a regime is needed for "punishing" suppliers who turn out *ex post* to be out of balance (i.e. their customers have used either more or less than the amount they have contracted for). In the energy sector, for instance, there are cash-out incentives for energy suppliers to remain in balance. In this case, the use of comparisons could be helpful in establishing appropriate levels of "balance" (i.e. whether there is an acceptable level of imbalance, below which firms would not be punished) as well as helping the industry by identifying best practice from firms that achieve good levels of balance.

3.154 Comparisons could be used to create incentives for efficient demand management. For example, firms could be rewarded under incentive schemes for innovative water efficiency programmes.

Environmental Performance

Description

3.155 Environmental resources are often not traded in competitive markets, and there is usually an incentive to overuse them in comparison to what would be socially desirable. Regulators can make use of comparisons between firms or industries in order to assess performance with regard to environmental impacts. These impacts may relate to greenhouse gas emissions, reflecting the potential problems arising as a result of climate change. They may also relate to other environmental issues — for example, the quality of water discharged from sewage plants into rivers, the use of renewable energy, or noise pollution.

3.156 Environmental regulation may originate from regulatory bodies other than the economic regulator responsible for setting price controls. However, where such standards require significant investment, this would normally be allowed for if some form of price control is in place, and is thus still relevant to price-setting regulators.

Practical examples

Ofwat: Use of comparative data in climate change assessment

3.157 Ofwat currently uses comparative data for three climate change purposes, namely carbon accounting, renewable energy and climate change adaptation. In all cases company data are used.

3.158 Ofwat collects carbon-accounting data in the June return, which includes comparative intensity ratios that record the carbon emissions per MI of water delivered or water discharged from sewage works. Comparing this information across firms enables Ofwat to assess what the main drivers of carbon emissions are for companies (in this case, the use of grid electricity and sewerage process emissions), and which of these drivers the companies are able to influence. Identifying these drivers required Ofwat to change its carbon accounting requirements, so that data on emissions were broken down into their source areas and were thus more meaningful.

3.159 This information is currently used for annual monitoring purposes, and is published in the Service and Delivery report which sets out Ofwat's analysis of how companies perform relative to each other. The publication of this information encourages companies to integrate greenhouse gas emissions management into their business procedures, and provides customers with an opportunity to identify and put pressure on companies underperforming in these areas.[27] Ofwat does not currently use this information directly in price reviews, but in the development of their approach for incentivising low carbon

[27] Ofwat (2010): 'Service and delivery – performance of the water companies in England and Wales 2009-10'

sectors it foresees a greater use of comparators, such as using comparative carbon information as a benchmark to reveal the scope for emissions reductions among firms.

3.160 Ofwat collects renewable energy generation data in the June returns. Ofwat uses these to reveal the uptake of renewables, and they also act as a proxy for whether AMP5 outputs are being met.[28] The comparisons are also used to identify the main sources of renewable energy (in this case the treatment of sludge) and to guide Ofwat's future policies.[29]

3.161 Ofwat also uses comparative data that do not immediately relate to climate change (such as serviceability indicators, level of service data, and SOSI data).[30] These data can act as a proxy for how prepared companies are for future climate change, and how well they would be able to cope with future events. The use of this type of information will become increasingly important as the need to understand and monitor climate change adaption and vulnerability grows.[31] Ofwat envisages that, with developments in this area, its use of comparative data for the measurement of adaption action and vulnerability will increase. Ofwat has also begun to track links between weather and company service by comparing service data with weather data (available from the Met Office).

3.162 Ofwat uses climate change comparators in a qualitative way to reveal company action and differences between companies, rather than mechanistically in regulatory processes.

3.163 Ofwat has highlighted the need to assess carefully the quality of the data to ensure that it is suitably robust and comparable, given the relatively short period over which climate change information has been collected (three years). It is possible that refinements to the way in which companies collect information could improve the usefulness of the data (for example, Ofwat overhauled its carbon accounting requirements for the 2009/10 June return to identify sources of carbon emissions in line with national Defra guidance on carbon accounting).

Ofwat: Use of comparative data in environment and water quality assessment

3.164 In addition to its work on climate change objectives, Ofwat currently uses comparisons of a range of environmental indicators and activities, such as pollution incidents and discharge consent compliance, based on company data. Whilst oversight of environmental performance is in general led by the Environment Agency, these comparisons help Ofwat identify the industry's best and worst performers, and contribute to company rankings which are discussed at annual company environmental performance meetings. The information also helps the Environment Agency (and Ofwat) identify whether and where any regulatory action is needed.

---

28 Assessment Management Plan 2010 - 2015
29 Ofwat (2010): 'Service and delivery – performance of the water companies in England and Wales 2009-10'
30 Security of Supply Index
31 This need is currently driven by the UK Government's climate change adaption sub-committee.

3.165 Ofwat also currently uses comparative data for price-setting purposes. Comparisons between companies' cost base data identify the relative efficiency of companies with regard to environmental enhancements, and inform decisions as to the scope for applying assumptions about efficiency catch-up to cost forecasts in companies' business plans.

3.166 In addition, Ofwat also uses comparisons between unit costs of environmental functions (such as provision of phosphorus reduction, pollution event-duration monitoring or provision of first-time sewerage) to determine appropriate caps on costs when setting price limits. This is done in areas where outputs are typically achieved by similar means (e.g. the same treatment process) and there is relatively little scope for explanatory factors to result in significant variance from the average unit cost, thus making comparability relatively high. Where different processes are used to achieve the same output, this will result in different unit costs. As some companies may be constrained in their choice of process by existing infrastructure, unit costs may not be comparable in these instances. In these circumstances Ofwat does not make use of comparators.

3.167 In general, Ofwat uses comparative data mechanistically given the focus on areas with high comparability. Ofwat used normalisation where necessary to account for company-specific factors to ensure a level playing field – for example, Ofwat made adjustments for company size when comparing pollution incident numbers. This requires data to be collected to enable Ofwat to split incident rates by asset type (such as sewer length, pumping station, and combined sewage overflow) and then to account for the incidents per company asset.

3.168 Ofwat has found the use of comparative competition for environmental and water quality issues to be an effective tool in improving companies' asset management and delivery of service. This is related more generally to the use of comparators in incentive schemes, which is discussed in Section 5.

Analysis of approach

Pros

3.169 Comparisons of environmental performance can be used to inform mandatory environmental standards that must be achieved by the regulated firms. This ensures that a minimum standard is delivered. The comparisons could also be used to create incentives for companies to achieve specific environmental objectives that, if left to the companies themselves, would not receive high priority in their decision-making process.

3.170 The use of comparators can help the regulator form a view on what environmental standards firms could be achieving, and potentially impose more challenging efficiencies than would otherwise be possible.

3.171 The requirement itself for companies to collect environmental data and the publication of environmental comparisons can focus company attention on these issues, and lead to raised awareness and more concerted efforts at improvement and efficiency - even in the absence of explicit regulation. For example, companies may employ carbon specialists

and develop internal teams to focus on environmental issues, such as developing business plans to reduce emissions.

3.172 Technical innovation and best practice are particularly relevant in the area of environmental performance (particularly relating to climate change), where many challenges and mitigation efforts are relatively new. The use of comparators can identify and promote the existence of new technologies or innovative processes.

Cons

3.173 Comparisons of environmental performance may be problematic because different issues are likely to be relevant in different regions of the country (or in different countries and industries, in the case of cross-country or cross-sectoral comparisons). For example, both available environmental resources (e.g. renewable energy resources) and the severity of environmental impacts (e.g. the existence of sensitive eco-systems) may vary in different parts of the country.

3.174 Environmental factors are often difficult to measure, making comparisons difficult. A further complicating factor is that many environmental challenges have only recently been identified, and understanding of the measurement and interpretation of indicators can be underdeveloped.

3.175 Although comparisons may help the regulator to create targets to incentivise firms to improve their environmental performance, this may involve complex calculations on the regulator's part. If the level is set too low or too high this will distort the firms' incentives to achieve the environmental objectives in question.

3.176 In relation to climate change and the abatement of greenhouse gases, particularly carbon dioxide, comparing environmental performance across firms may encourage the reduction of carbon emissions even though it may in fact be more cost-effective for carbon dioxide to be abated in other sectors. In the water sector, this may not be a concern for Ofwat, as the companies have a much larger incentive to reduce their carbon emissions in the form of the government's Carbon Reduction Commitment.[32]

3.177 Specific elements of environmental data, particularly those relating to carbon emissions, are associated with different levels of uncertainty (for example, emissions from some processes are much better understood and valued than emissions generated by other processes). The reliability of data therefore needs to be carefully considered before use.

Applicability to Ofwat

3.178 Ofwat may want to incentivise companies to achieve specific environmental objectives that, if left to the companies themselves, would not be particularly important in their

decision-making processes. This could potentially apply to all stages of the value chain, although environmental impacts may be greater for resources, treatment and network activities than for retailing.

3.179 The assessment of environmental performance may overlap with other objectives such as the balancing of supply and demand, and it may thus be possible to make use of the data and information collected for comparisons across more than one dimension.

3.180 To the extent that environmental issues such as climate change affect customers' decisions (e.g. because business customers wish to demonstrate their own environmental credentials), water and sewerage companies may begin to compete on their environmental performance. The information published by Ofwat could support such competition – indeed, Ofwat currently includes some environmental performance indicators in the Service and Delivery Report which is published with the public in mind.[33]

3.181 In a competitive market it is unlikely that environmental externalities will be fully reflected in pricing. It may therefore be necessary to impose common requirements on all competing businesses, either through regulation or legislation. The use of comparators could be valuable in this context as it could help inform what these common standards should be, particularly in the case of new technologies and innovation where there may be more unknowns.

3.182 Vertical disaggregation of the industry may also facilitate refinement of the use of environmental performance comparisons. For example, emissions and renewable energy issues (which are mainly related to sewerage operations) may be most relevant to the network plus section of the value chain, and focusing comparisons of these variables on this part of the value chain may enable more targeted information collection which could potentially result in more detailed and comparable data. This may not only impact the work of Ofwat but also the work of other regulators.

Financial Performance

Description

3.183 Under the Water Act 2003, two of Ofwat's statutory duties are:

> to further the consumer objective;
>
> to secure that companies holding appointments…are able (in particular, by securing reasonable returns on their capital) to finance the proper carrying out of those functions.[34]

---

[32] http://www.decc.gov.uk/en/content/cms/what_we_do/lc_uk/crc/crc.aspx

[33] The publication of this information is being reviewed by Ofwat as part of its review of regulatory compliance.

[34] Water Act 2003 http://www.legislation.gov.uk/ukpga/2003/37/part/2

3.184 Regulators can compare companies' actual financing structures and some aspects of actual financing costs (e.g. the actual cost of debt) to assist in developing an estimate of the Weighted Average Cost of Capital (WACC). A cost of capital allowance which is too low may result in the regulated entity being unable to finance new investment and consumers paying too little relative to the cost of the service. A cost of capital that is too high results in consumers paying more than is necessary.

3.185 Financeability refers to the need for the regulatory regime to enable an efficiently operated company to finance its activities. If a regulator gives inadequate attention to this when setting the cost of capital, it may lead to cash-flow problems for the firm and difficulties operating the business. Several regulators specify that the companies they regulate should maintain investment grade credit ratings as a licence condition. Credit ratings are based on a number of factors, including key financial ratios such as cash interest cover and gearing. If a company's price limits do not allow it to maintain adequate cash flows, this could result in deterioration in its financial ratios and possibly a credit rating downgrade. A downgrade would tend to increase in the cost of raising finance for a company. At price determinations, regulators have typically undertaken modelling to ensure that their proposed price limits are consistent with companies maintaining key financial ratios, and hence reducing the risk of credit rating downgrade.

3.186 When setting the WACC and testing financeability at price reviews, looking at financial information for comparators might be useful for the following (among other things):

(a) Estimating the equity and asset beta (i.e. by estimating betas for comparator companies). This is particularly useful for companies that have no listed equity.

(b) Estimating the debt premium, by looking at spreads on bonds of comparator companies or industries.

(c) Estimating what allowance (if any) should be made for embedded debt. For instance, in circumstances where a company has high embedded debt costs, comparisons could be used to determine whether this debt was efficiently taken out (i.e. by examining whether other companies also took out similar debt) or whether it represented poor financial decision-making by the company concerned.

(d) Determining an appropriate notional gearing level to assume (e.g. based on average or typical gearing levels across the industry).

(e) Developing assumptions for notional balance sheets to use in financial modelling (e.g. what proportion of index-linked debt to assume).

(f) Developing assumptions on best practice financial policies to assume for the purpose of financial modelling (e.g. on liquidity).

3.187 On-going financial comparisons might be useful to monitor company performance and financial robustness. For example, if one company started to exhibit stressed financial ratios whereas the rest of the industry did not, then the regulator might wish to investigate

further, given the potential consequences for consumers of a company being in financial distress. Comparisons might look at the following (among other things):

- profitability measures (e.g. return on capital, profit margin);
- gearing;
- credit rating;
- financial ratios used by the credit rating agencies.

Practical examples

Ofwat: Financial performance and expenditure comparative report[35]

3.188 Ofwat has published an annual comparative report on the financial performance and expenditure of the regulated water and sewerage companies and water-only companies in England and Wales. The report examines the operating profits, cash flows, opex and capex for each company. Six small companies, which have a combined turnover of less than £3 million, are not included in the report.

3.189 The information is based on information in the companies' June returns and regulatory accounts that each company submits to Ofwat. The regulatory accounts include an independent accountant's audit report.

3.190 The 2009-2010 report includes data for the accounting years 2004-2005 to 2009-2010. The information is provided on a current cost basis. Prior-year information is rebased to 2009-2010 prices using the Retail Price Index (RPI). The information is presented in tables containing each of the companies' data by indicator across the five-year period, for ease of comparison.

3.191 As part of Ofwat's accounting separation project, each company must now report costs and asset values for the following nine separate business units:

- water resources;
- raw water distribution;
- water treatment;
- treated water distribution;
- sewerage collection;

[35] Ofwat: Financial performance and expenditure comparative report http://www.ofwat.gov.uk/regulating/reporting/rpt_fpe_2009-10.pdf

- sewerage treatment;
- sludge treatment;
- sludge disposal;
- retail.

3.192 It will be possible in the future to use this information to make comparisons on performance at an individual business unit level, although accounting separation is an on-going project and data requirements might change.

The Office of Energy Regulation (Energiekamer): Estimation of beta[36]

3.193 In the WACC calculation, the "beta" reflects the extent to which the value of the shares of a company is linked to the value of the total equity market, and is a measure of the riskiness of the company.

3.194 Since Dutch grid managers are not listed on the stock exchange, it is not possible to calculate the beta on the basis of observed market data. Instead, the Board of Directors of the Netherlands Competition Authority (hereinafter "the Board") constructs a reference group, which contains companies with a similar risk profile; and which undertake, as far as possible, activities corresponding to the regulated activities of the Dutch regional grid managers.

3.195 The Board decided that, given the comparable risks and similarities in the regulatory system between electricity grid managers and gas network managers, the reference group could consist of both types of firm.

3.196 Another criterion used by the regulator to determine the inclusion of a company in the reference basket is the liquidity of their shares, since shares that are illiquid are unlikely to provide reliable estimates. The regulator also took into account the comparability of the regulatory system.

3.197 The resulting reference group included 14 companies: 1 from Argentina, 2 from Australia, 2 from Canada, 1 from Spain, 4 from the UK and 4 from the USA.

3.198 The regulator then determined the equity beta of the reference group using the median of the equity betas of the companies in the group. Two methods are used for calculating the beta to ensure that the estimates are less sensitive to the choice of data frequency and the period. The first method of calculation determines the beta on the basis of daily

[36] Addendum C to the method decision, Method decision in relation to the X factor and the volume parameters of regional grid managers for the third regulatory period, 2006
http://www.energiekamer.nl/images/Addendum%20C%20Method%20Decision%20RNB%20E%20X-factor%20102106-89_tcm7-94487.pdf

returns during the past two years, and the second method determines the beta on the basis of weekly returns for the past five years.

Analysis of approach

Pros

3.199 Financial comparisons can assist regulators in ensuring that price limits enable regulated firms to finance their functions. This is achieved through the regulators' use of comparisons to assist in determining the WACC and assessing financeability, and also through on-going financial comparisons which may help to identify any companies that are in danger of financial distress.

3.200 The use of comparisons may be particularly important for regulators setting the WACC for regulated entities which do not have any listed equity, and perhaps do no listed bonds either.

3.201 More generally, the use of comparisons allows the regulator to do financeability analysis based on notional assumptions (perhaps based on typical practice across the industry) rather than using companies' actual financial decisions, thus helping to ensure that shareholders, not customers, bear the consequences and risks if companies choose to adopt atypical financial structures (e.g. very high levels of gearing).

3.202 In the absence of financial comparisons between companies, the possibility exists for regulatory gaming by the companies. For example, companies may increase their gearing to stress financial ratios in the expectation that the regulator will provide a financeability adjustment.

3.203 More generally, making financial comparisons helps ensure financial assumptions at price reviews are based on best practice (e.g. on liquidity policies), such that customers do not pay for any inefficient financial management.

Cons

3.204 In setting the WACC, if comparators used are from other sectors or if international companies are used in the reference group, then issues of comparability arise. For instance, in determining the equity beta, it is important that the reference companies have comparable risk profiles to the regulated entities under consideration. It may not be the case that companies in other sectors and from other countries face equivalent risks, and hence their betas, bond spreads etc. may not be comparable.

3.205 Specific firms may also face specific financial issues which are not faced by comparator firms, even if those comparators are from the same industry and country. For example, a small firm with a large capex programme may face greater financeability issues than other firms in the same industry.

Applicability to Ofwat

3.206 Ofwat is likely to continue to have to determine the WACC and assess financeability for monopoly parts of the value chain (e.g. networks), and also for other parts of the value chain in the transitional period before competition has developed sufficiently for regulation to be removed. Use of financial comparisons may therefore continue to play a role in determining the WACC and carrying out financial modelling for the purpose of testing financeability.

3.207 Comparators from other sectors may be useful at price reviews when assessing the asset beta and debt premium, given only a small number of water companies are now listed. However, comparability issues need to be borne in mind.

3.208 Under the potential market reforms, use of comparisons for setting the WACC at price reviews will no longer be relevant for sectors of the value chain which are contestable once competition has developed sufficiently for competition to replace regulation.

3.209 In the long run, on-going monitoring of financial robustness may also not be relevant for these parts of the value chain, given that reliance on markets and competition might be taken as implying greater acceptance that firms would be subject to market discipline and hence allowed to go bankrupt if they get into difficulties.

3.210 However, the opposite may be true in the short run. In particular, given the concerns that critics have about the cost of finance and financeability issues under any changes to market structure, Ofwat might wish to make enhanced use of financial comparisons to monitor financial outcomes very closely for the first few years of potential market reform. This would allow it to check whether market reform was leading to any problems, either to rebut criticism if no problems emerged or else to adjust the way in which market reform is approached if problems do materialise. Given the real-time nature of financial markets, annual monitoring is unlikely to be sufficient for this purpose, and hence Ofwat might need to monitor some financial variables much more frequently during this period (even if publication of comparative information only takes place once a year). Frequent monitoring is likely to be most feasible for those financial variables which can be calculated from financial market data without requiring accounting information from the companies.

Technology or Processes

Description

3.211 Comparisons of technology or processes involve the regulator taking a disaggregated approach to comparisons of firms' activities, through looking at particular technologies or processes involved in the delivery of a service, rather than comparing the business as a whole.

3.212 The use of certain technologies and processes is likely to differ amongst companies within an industry, although some technologies and processes are likely to be similar for

those companies carrying out comparable activities. Comparisons between firms employing similar processes can help the regulator to establish the relative efficiency of a firm with regard to a particular process. Comparisons of technology or processes can be made between companies in the same sector, whether within the same country or internationally. In addition, specific processes can be compared across different sectors provided the processes are suitably comparable.

3.213 Comparisons of technology and processes are commonly used by regulators in a "bottom-up" approach to assessing cost efficiency. A bottom-up analysis involves consideration of the costs and scope for efficiency improvement in individual processes, which can include using process-level benchmarks. This work may be used to set the efficient level of costs for firms during a price review period. The bottom-up analysis may also be used as a complement to other work streams, for instance to provide information about any "efficiency gap", and to explore factors behind any difference in performance which could be explained by reasons other than inefficiency on the part of the company's management.

Practical examples

ORR: Gap analysis[37]

3.214 To complement its econometric-based cost-efficiency work, the ORR uses process comparisons in order to understand the cost-efficiency gap between Network Rail and its peers. The ORR sees this as an important strand of work, since the econometric analysis does not explain the reasons for the efficiency gap and because there are uncertainties associated with the econometric analysis. The gap analysis allows the ORR not only to validate the gap, but also to determine if it is entirely due to inefficiency or whether there are other factors at work which are outside the control of Network Rail management.

3.215 The gap analysis work for the price review in 2008 included work by consultants which looked at individual technologies and working methods used by infrastructure managers in other countries. This piece of work for the ORR included the development of two ideal network models, based on a set of standard network characteristics, to test the impact and scale of different maintenance and renewal practices. There were also four international study visits to identify good engineering practice, and a range of different approaches to asset management practice.

3.216 The ORR also sent its own engineers to visit infrastructure managers in several countries to research the approaches taken to asset management, although this evidence was more anecdotal, and the ORR intends in future to use more formalised partnerships with rail organisations to share data.

---

[37] Relative Infrastructure Managers' Efficiency, RailKonsult 2010, http://www.rail-reg.gov.uk/upload/pdf/econometric_update_2010_railkonsult_paper.pdf

CAA: Assessment of NERL's back-office costs[38]

3.217 NATS (En Route) plc (NERL) provides en route air traffic services in the UK. The CAA is the economic regulator of NERL. As part of the price controls review in 2011, the CAA commissioned external consultants to undertake an assessment of NERL's back-office costs, namely finance, information solutions, human resources and facilities management. The aim was to determine the relative efficiency of NERL's back-office costs, and the approach taken was to benchmark NERL relative to comparable firms and industries.

3.218 A significant element of the CAA's work was to assess the validity and consistency of the data. The CAA sent a data request to NERL, and data from the PwC's global best practices benchmarking tool and IPD were assessed for comparability with NERL and used where appropriate. In assessing the costs of regulation, the CAA used the four UK-regulated gas distribution companies because: their average turnover is close to NERL's, they are also regulated by an independent UK regulatory authority, they also face five-yearly price controls, and the dataset was the most recent available at the time the analysis was undertaken.

3.219 The results are framed within the context of the CAA's position that NERL's efficiency should be at least above the median company. A function at NERL is deemed to be "relatively efficient" if the function is efficient relative to the benchmark.

3.220 Although part of this exercise puts figures on the cost savings which could be achieved by NERL under "low" and "high" savings scenarios, it is acknowledged that there may be reasons why NERL is unable to achieve these. It is possible that constraints at NERL do not allow such savings to be achieved (for example, with regard to pensions), and it is also possible that differences in comparability between datasets lead to inaccuracies.

Analysis of approach

Pros

3.221 Bottom-up analysis, where technologies and processes are compared, is a useful complement to top-down efficiency work since it can help to confirm the robustness of the top-down analysis. This validation role is particularly useful where econometric analysis is undertaken which feeds directly into price controls.

3.222 If it is possible to identify similar processes in other sectors, comparisons of this process can be made across different sectors which allow for a larger basket of comparators. This can make the conclusions drawn from the benchmarking exercise more reliable and can help to highlight inefficiencies specific to the regulated firms.

---

[38] Assessment of NERL's back-office costs, LECG 2009
http://www.caa.co.uk/docs/5/LECG_report_on_Backoffice_costs.pdf

3.223 These types of comparisons allow the determination of best practice within the industry, or of a specific process or technology where inter-industry comparisons are made. The results of these comparisons can be used by the regulator to incentivise regulated entities to adopt more efficient technologies and/or processes. If the results of the comparisons are published, this information can also help firms to identify areas in which improvements can be made to their own processes based on the processes employed by other firms.

Cons

3.224 Comparability may be an issue, particularly where certain technologies or processes are sector-specific. Including comparators from other countries, which can increase the number of comparators, may not resolve this issue since there could be country-specific factors at work.

3.225 Comparisons of the use of certain technologies or processes may only be possible at a high level and in a qualitative manner. Where this is the case, putting any figures on the benefits of the technologies or processes may not be possible, and so there could be difficulties in integrating these types of comparisons into other strands of work in order to draw meaningful conclusions.

Applicability to Ofwat

3.226 Ofwat does not currently carry out any process-level benchmarking. However, it may be possible for Ofwat to make use of the disaggregated functional expenditure data it collects (or data gathered through the work on accounting separation) to carry out benchmarking of costs at a more granular level. (Ofwat is currently looking at the service definitions under different accounting separation business units and at the feasibility of bottom-up cost modelling.) Alternatively, a more standard approach to bottom-up cost benchmarking could be employed, whereby external consultants review the structure and accounts of the water companies, and provide an assessment of whether or not the different activities undertaken are being performed efficiently. Process benchmarking may also be useful where new requirements have developed, for example, in relation to climate-change mitigation and adaptation activities.

3.227 Implementing separate sub price controls for the resources and network plus parts of the value chain may make comparisons of technology or processes easier, because the processes and technologies employed are likely to be very specific to different parts of the value chain. With separate price controls, it may therefore be more straightforward to provide incentives to improve efficiency or to adopt best practice. It would still be possible to carry out process-level benchmarking within a global “wholesale” price control; however, it may be more difficult to create incentives that apply to specific processes at a particular stage of the value chain.

3.228 If entry into the contestable parts of the value chain occurs, there will be more suitable comparators available, and, where comparisons of technologies and processes are published, this may be useful information to the industry, particularly with regard to the adoption of new technologies. However, if competition develops sufficiently in these

markets there may be less need to make use of comparisons of technology or processes, since firms will have a strong incentive to seek out best practice for themselves.

3.229 Ofwat does not envisage a requirement for functionally separate system operators in advance of the next round of price controls – functions identified as relating to system operation will instead be part of the network plus business. Nonetheless, it may be possible for Ofwat to carry out cross-sector or international comparisons of processes or technology, given the specificities of the processes involved in system operation. This may be particularly useful as a transitional approach to the future establishment of system operation services to help establish benchmarks for efficiency of certain processes and best practice.

Some Combinations of the Above

Description

3.230 Although regulators often make use of comparisons of different aspects of firm performance in isolation, in reality, many aspects of performance are jointly determined by firms, given the trade-offs that often exist between these different elements. In particular, where firms are incentivised to achieve cost efficiency savings, there may be a subsequent reduction in the firms' performance with regard to aspects such as quality or environmental performance, which may lead to socially sub-optimal outcomes.

3.231 To address the trade-offs between different aspects of firm performance, the regulator may regulate each aspect separately; or, alternatively, the regulator could implement an approach in which comparisons are used to assess jointly different aspects of performance. For example, a potential approach is the joint treatment of costs and quality in benchmarking exercises, which has the advantage that the regulator does not need to have a separate cost allowance for achieving quality levels, since quality has been incorporated into its assessment of costs.

Practical examples

The Office of Energy Regulation (Energiekamer): Yardstick competition - X factor and Q factor

3.232 In 2004, the Dutch energy regulator (formerly DTe) enacted a system of yardstick competition for electricity companies where the X-factor used in the "RPI-X" formula is based on the average efficiency improvement of the sector.[39] An interesting feature of the Dutch experience is that in order to ensure that the efficiency improvements are not made at the expense of the reliability of the network, quality regulation is coupled with yardstick

[39] See DTe, 2002, Yardstick Competition Regional Electricity Network Companies, Second Regulatory Period available at http://www.energiekamer.nl/images/12_7171_tcm7-5590.pdf

regulation.[40] The regulation was intended to incentivise improvements in reliability of grid services, and to provide an incentive for network operators to invest in asset replacements.

3.233 The formula for the allowed revenues is therefore AR' = (1+CPI±X+Q) AR, where AR is the allowed revenues, CPI is the consumer price index, X is the efficiency factor and Q is the quality factor. Hence, the allowed revenues in any given period (AR') are calculated on the basis of the allowed revenues in the previous period adjusted to take into account the X factor and the quality factor (Q) in addition to inflation.

3.234 In order to set the Q factor, the regulator needs to know the cost of quality investments and the valuation of quality by end users. The network operators supply the former information using a format prescribed by legislation, whilst the regulator commissioned an external consultancy to undertake a large scale study on customers' valuation of continuity of supply to inform the latter. The study involved more than 12,000 households and 2,500 small businesses.

3.235 The regulator initially proposed a complex methodology for valuing continuity of supply. For instance, the value of the continuity of supply was differentiated for each day of the week as well as for each season, and was different for households and small businesses. However, Network Operators questioned the administrative burden of implementing such a methodology, and given that the other differentiations had a relatively small effect on the revenues of the operators, ultimately continuity of supply was only valued separately for households and small businesses.

3.236 In establishing the Q factor, the regulator compared the quality of a firm's network to the average quality of all electricity distribution networks in the Netherlands, and a monetary value is put on any deviation from the average quality. Network operators with a quality higher than average receive extra revenues through higher tariffs. The regulator set the value of Q equal to zero for the second regulatory period (2004–2006) due to a lack of data on quality for the first regulatory period (2000–2003).[41]

3.237 The regulator therefore attempted to incorporate incentives for companies to make their own assessment of the optimal balance between reliability and efficiency. A company which invests in the reliability of its network will have higher costs, which, all else being equal, will result in lower profits than for a company that does not invest. On the other hand, the company is allowed by the regulator to get higher revenues in that part of the regulatory model relating to quality.

---

[40] See Hesselingand Sari, 2006 The introduction of quality regulation of electricity distribution in The Netherlands, available at http://www.nmanet.nl/Images/2007-5-The%20introduction%20of%20quality%20regulation%20of%20electricity%20distribution%20in%20The%20Netherlands%20-%20Dennis%20Hesseling%20en%20Mahir%20Sari_tcm16-116542.pdf

[41] http://inderscience.metapress.com/media/cmw755ttxl1qnjykklby/contributions/y/1/q/6/y1q67xv36r04t729.pdf

3.238 If the regulator has correctly assessed the value that consumers place on improvements in quality, this regulatory approach should give network companies an incentive to choose the level of quality where the marginal cost of an additional investment in quality is equal to the value of the additional quality to end users. This will be the level of quality that optimises social welfare.

3.239 The model used by the Dutch regulator also attempts to eliminate "historic inefficiencies" by including in the yardstick (for both prices and quality) only companies that achieved a given efficiency limit in previous regulatory periods. The companies that do not enter the determination of the yardstick are given targets on the basis of average improvements.

Analysis of approach

Pros

3.240 The principal advantage of the joint treatment of different aspects of performance when using comparisons is that it can help to address the trade-offs that might exist between them. This approach will be most useful when comparing aspects of performance that are jointly determined by firms, particularly where the firm is incentivised to minimise costs. In particular, this approach can allow the regulator to incorporate aspects such as the levels of quality of service into its assessment of the efficient level of costs.

3.241 The use of comparators in this way can also help to alleviate the information asymmetry between firms and the regulator. Comparisons of different variables that are jointly determined by the firm can provide the regulator with information on the way in which increasing performance with respect to one variable impacts on another variable. For example, the joint treatment of quality of service and costs will provide the regulator with information on the extent to which increasing quality of service levels will increase costs.

3.242 If, as in the example given above, the marginal reward for an increase in quality is set equal to the value that society places on such an improvement, the regulated companies will be incentivised to choose the socially optimal level of quality. However, it should be noted that this feature relates to whether the marginal reward for quality is set at an appropriate level and not to the use of comparators *per se.* (In other words, the same result could be achieved by a non-comparative quality incentive scheme, provided that the marginal reward for quality was set at a correct level.)

Cons

3.243 In practice, this approach is best implemented for variables for which it is possible to make quantitative comparisons. It is more difficult to provide an assessment of the trade-offs that exist between different aspects of performance based on comparisons of qualitative information, and a degree of subjectivity may enter the procedure.

3.244 Such an approach can be problematic because different aspects of performance may be difficult to compare in the same way; and where comparisons can be made across different dimensions, it may be difficult to apply appropriate weights to different aspects of

performance. If inappropriate weights are applied, this may bias the comparisons towards one particular variable, e.g. cost rather than quality, which could distort the firms' incentives. For example, if surveys of consumers are used to assign values to aspects of quality, there is a danger that the survey results may mis-measure consumer valuations (e.g. through survey bias). Indeed, it is notoriously difficult to obtain accurate estimates of consumers' willingness to pay and there is the potential for consumer preferences changing over time.

3.245 Since comparisons can only be made if the variables in question can be compared in the same way, it may be necessary for the regulator to "clean" existing data, or for the regulator to collect new information, in order to adopt this approach. There is also an issue of potential time lags between when an action is or is not taken, and its effect on the variables being compared (e.g. time lags between when costs are incurred to improve quality and when the quality improvements materialise).

Applicability to Ofwat

3.246 Although Ofwat makes extensive use of comparisons within its regulatory framework, it is usually the case that comparisons are made across a single dimension. In some instances, however, adjustments are made to the results of one comparison exercise (e.g. allowed revenues derived from an assessment of efficient costs) to take account of the results of another comparison exercise (e.g. quality comparisons). For example, at PR09, Ofwat's incentive mechanisms included a performance-related adjustment to prices: a company that scored well on the OPA would be allowed to charge its customers slightly more, while those that did not perform as well would have to charge slightly less.

3.247 Given the data that are collected by Ofwat at present, (which are currently under review) it may be possible for Ofwat to implement an approach in which an index of quality (based on the quality variables that are measured at present) is considered as an additional output variable and included in the operating expenditure benchmarking procedure. In this way, aspects of quality would be incorporated into Ofwat's assessment of firms' operating costs. Introducing a quality indicator is especially effective where the indicator can be easily and reliably measured, is widely accepted within the industry and by consumers, and has a relatively low administrative burden on the firms. Such an approach would potentially be more difficult for aspects such as environmental performance given the manner of the dimensions that are involved.

3.248 If potential market reform is successful, there may be less need for comparisons of this nature for contestable parts of the value chain, because firms will compete on dimensions such as quality as well as price. However, in the absence of sufficient competition, the joint treatment of costs and other elements - such as quality of service - could still be a useful way of incentivising firms to adopt the optimal trade-off between costs and quality of service.

3.249 This approach could be adopted whether separate price controls are implemented or whether a global "wholesale" price control is in place. Under separate price controls,

Ofwat may more readily be able to identify the different trade-offs that exist between cost and other variables (such as quality of service) at the different stages of the value chain, provided there are enough comparators. Such an approach could also, in principle, be implemented for the system operation functions within the network plus business unit.

4 HOW ARE COMPARISONS MADE?

4.1 Having considered different variables that the regulator might compare, we now discuss different techniques and approaches that can be used to make these comparisons. In particular, comparisons may make use of quantitative techniques, qualitative review, or both.

4.2 The use of a particular technique is likely to be dependent on what variables are being compared and the number of comparators that are available. Certain approaches may be more appropriate, given the data that are available and the extent to which the data can be compared. For example, in the absence of domestic comparators, it may be necessary to use international comparators - which may limit the nature of the comparisons that can be made if the operating environments of the different firms are particularly diverse.

4.3 In this section we present seven different techniques that can be used by regulators to make comparisons. They are:

(a) qualitative comparisons;

(b) simple metrics;

(c) index numbers;

(d) regression techniques;

(e) Data Envelopment Analysis (DEA);

(f) qualitative review alongside quantitative comparisons; and

(g) requirement on companies to provide comparable information to customers.

Qualitative Comparisons

4.4 Comparisons between companies can be qualitative rather than quantitative. These kinds of comparisons can take a number of different forms and can be used for different purposes.

4.5 One approach is for the regulator to collect qualitative information from the companies and make comparisons based on this information. Such comparisons could have a range of potential uses, such as:

(a) Identifying differences between companies, perhaps to assist the regulator in identifying which explanatory variables to use in subsequent quantitative comparisons and/or to interpret the results of quantitative comparisons (see later discussion of "Qualitative Review Alongside Quantitative Comparisons").

(b) Identifying what represents typical practice by the industry (e.g. to inform assumptions when setting price limits).

(c) Identifying what represents best practice by the industry. This might require either expert input to identify which of the practices being pursued by the different firms represents best practice; or comparison with quantitative data to see which practice is associated with the best outcome.

(d) Producing a ranking of companies, by using expert judgment to interpret the qualitative information. For example, the regulator may compare company practices in a particular area (e.g. sustainability) and use its expert judgment to produce a scoreboard for how well it perceives companies are performing, or to identify top-performing companies.

4.6 Qualitative comparisons can also be based on information supplied by some party other than the firms themselves. For example, a customer organisation might compare certain aspects of firm performance (e.g. with regard to how easy it is for customers to understand information on bills) in order to produce a comparative qualitative assessment. Similarly, focus groups could be used to collect qualitative views from customers on the performance of different firms.

Description

Practical examples

ORR: International best practice study[42]

4.7 As part of its work for the 2008 Periodic Review, the ORR sent its engineers to visit infrastructure managers in several countries in Europe, North America and Australia. The aim was to seek information that would help in the assessment of Network Rail's expenditure plans and to enable a determination of the appropriate expenditure required.

4.8 The ORR highlighted that comparisons across countries are difficult given the range of varying underlying factors. As such, the fact-finding tour did not represent a formal benchmarking exercise, but rather provided an opportunity to identify areas of international best practice where Network Rail could either apply lessons or undertake further investigation into opportunities to improve its own business processes.

4.9 The evidence gathered was anecdotal. Once the evidence had been gathered it was organised under five main themes that reflected the key elements of best practice to asset

[42] ORR (2008) 'ORR Best Practice Study: A report on the programme of international visits carried out by ORR between July – October 2007'
http://www.rail-reg.gov.uk/upload/pdf/wbps-rail-summary-reprt2.pdf

management: strategy and policy, asset life cycle processes, delivery, technology and equipment, and people issues.

4.10 The information collected during the visits allowed for qualitative comparisons to be made. The ORR made a number of recommendations to Network Rail in areas where it felt that Network Rail could benefit from adopting international best practice. The ORR also used the exercise to challenge Network Rail to consider how it could improve in line with international examples.

4.11 The ORR plans to build upon the initial visit programme in the future and to carry out more focused investigations of issues that it has identified as being of potential value.

Ofgem: Electricity Distribution Customer Service Reward Scheme[43]

4.12 In 2006 Ofgem introduced the Electricity Distribution Customer Service Reward scheme, an initiative to encourage better customer service in areas that cannot be easily measured or incentivised through more mechanistic regimes, by recognising and rewarding distribution companies that demonstrate innovation and creativity.

4.13 The Distribution Network Operators (DNOs) may submit entries to Ofgem. A total reward of £1 million is available across the chosen categories. The focus may be altered each period, although the scheme focuses on three broad categories:

(a) priority customer care initiatives;

(b) initiatives relating to corporate social responsibility; and

(c) wider communication strategies.

4.14 Entries from distribution companies are judged by a multidisciplinary independent panel of experts appointed by Ofgem. In 2008-2009 the panel included representatives from Age Concern, Consumer Focus, the Centre for Management Under Regulation (CMUR), the Fuel Poverty Advisory Group and the Royal National Institute for the Blind (RNIB).

4.15 The panel of judges has noted that many companies demonstrate that they have implemented best-practice initiatives identified from previous years' schemes. This fulfils the overall aim of the scheme to raise levels of service through the adoption of best practice.

[43] Report on the Electricity Distribution Customer Service Reward Scheme 2008/09 http://www.ofgem.gov.uk/Networks/ElecDist/QualofServ/CustServRewSch/Documents1/Decision%20Report%20for%202008-09%20Electricity%20Distribution%20Customer%20Service%20Reward%20Scheme.pdf

Analysis of approach

Pros

4.16 This technique is a very flexible approach to the use of comparators. The comparisons can be used in a range of applications.

4.17 When using quantitative techniques to make comparisons, it can often be difficult to account for certain factors that cannot be measured easily or to take account of imprecision in the data. Qualitative comparisons can act as a sense check on the results of the quantitative techniques employed. This approach can help to minimise the extent to which the final conclusions drawn from data comparisons are subject to error.

4.18 Qualitative comparisons can also be applied in areas where quantitative comparisons are not feasible. This may allow regulators to apply incentives in areas that cannot be easily measured or incentivised by setting quantitative targets that the firms must achieve.

4.19 Further, qualitative comparisons can highlight examples of good practice to firms which may help to increase standards within the industry. Best practice can be identified in a wide range of areas, since international and inter-industry comparisons can be more readily made, as the limitations of the data can be taken into account more easily than they can in quantitative work. This allows for a wider evidence-base to be used in identifying best practice.

Cons

4.20 The principal drawback of qualitative comparisons is that some discretion is required in the application of the results of the comparisons. This may leave the regulator open to disagreements from stakeholders on the grounds of the subjectivity of the conclusions drawn.

4.21 Where results of qualitative comparisons are used to inform incentive schemes, the discretionary nature of decisions based on qualitative review can mean that there is less clarity with regard to what must be achieved by a firm in order to be rewarded, and also less clarity for the regulator.

4.22 Qualitative comparisons can allow the regulator to identify and promote best practice within the industry. However, if companies are simply made aware of best practice without being incentivised to adopt it, then this may not be sufficient to change entrenched practices.

Applicability to Ofwat

Data issues

4.23 Although qualitative comparisons do not, by definition, require the collection of quantitative data, Ofwat may still need to collect qualitative information either from the companies or from third parties.

4.24 Generally it might be expected that qualitative information may be easier for companies to provide than quantitative data, since no measurement processes need to be put in place. However, the extent to which this applies in practice will depend on the specific type of qualitative information that Ofwat requests.

Potential value of comparisons

4.25 Making qualitative comparisons may be useful to Ofwat in a number of areas. It is also a potentially useful approach in the context of reducing the burden on companies of regulatory compliance.

4.26 Ofwat can use such comparisons to investigate differences between companies, helping to prepare the ground for quantitative comparisons (e.g. by informing the choice of explanatory variables) and/or to interpret results from quantitative comparisons.

4.27 Qualitative comparisons may be particularly useful if the regulator wishes to encourage best practice in areas that cannot be easily measured or incentivised through specific targets that the firms must achieve. Regulators can compare and incentivise such aspects of performance as sustainability, which can discourage firms from seeking cost efficiency savings at the expense of less easily quantifiable aspects of performance.

4.28 More generally, Ofwat can use qualitative comparisons to identify typical or best practice, both for the purpose of informing its assumptions when setting price limits and/or to encourage the dissemination of best practice across the industry through information provision.

Impact of potential market reform

4.29 Potential market reform has the prospect of changing the way the industry operates, potentially leading to new industry structures, new management processes, and possibly even the application of new engineering solutions.

4.30 In this context, qualitative comparisons may help to identify and disseminate best practice in terms of how firms operate in the new framework. Qualitative comparisons could help to identify which approach works best, enabling best practice to be identified and disseminated more quickly than if each firm had to discover the best approach working in isolation. This may be a particularly useful approach for the system operation functions of the network business, as there may be an element of “learning by doing” as different

network plus businesses try different approaches to carrying out their system operation functions.

4.31 Qualitative comparisons could also have a role to play in underpinning continued use of quantitative comparisons. In particular, the potential changes in the way in which the industry operates and is regulated may mean that some of the assumptions underlying existing quantitative comparisons (e.g. which variables are key drivers of costs) may no longer hold true. Qualitative comparisons could help Ofwat to update (or at least, to test the continued applicability of) some of the assumptions underlying its quantitative models.

Simple Metrics

Description

4.32 Simple metrics is a broad term which we are using in this context to refer to a range of simple techniques that are used to help compare quantitative data. Simple metrics can include:

(a) *Comparison tables*. The data are presented in a consistent format in columns and rows.

(b) *Graphical representation of the data*. Presenting the data in a visual way allows for an easier comparison of the data. The distribution of the data can be assessed, relationships between variables can be investigated (for example, looking at correlation and trends), and outliers in the data can be readily identified.

(c) *Simple statistical techniques* such as calculating the mean, median and standard deviation of the set of comparators, calculating confidence intervals and conducting t-tests on the data.[44]

4.33 Simple metrics are used in a range of different applications and are often used in conjunction with other techniques, such as regression analysis and qualitative review by experts. A few interesting examples of the application of such metrics are given below.

[44] The mean (formally the arithmetic mean) is defined as the sum of 'n' terms divided by 'n'. The median is the middle value of a set of values (where the values are arranged in ascending order). The standard deviation is a measure of the variation of the data from the mean. A low standard deviation indicates that the data are close to the mean, whilst a high standard deviation indicates that the data have more variability and are spread over a larger range of values. A confidence interval is a range around the sample estimate in which the population estimate is expected to fall with a specified degree of confidence (usually 95 per cent of the time or 90 per cent of the time). Confidence intervals are commonly reported in tables or graphs along with point estimates of the same parameters, to show the reliability of the estimates. T-tests can be used to test hypotheses on the data, given certain assumptions; they can be used to test whether certain values are significantly different from each other.

Practical examples

Ofwat: Models for capital expenditure[45]

4.34 During the last price review, Ofwat used the cost base comparative tool to assess the relative catch-up efficiency of companies in procuring and delivering capital projects. The results adjusted Ofwat's baseline expenditure in the Capital Expenditure Incentive Scheme (CIS). This unit cost benchmarking analysis compared company estimates of standardised unit costs (standard costs) for a representative range of capital projects.[46]

4.35 For each standard cost, Ofwat:

(a) looked at the data distribution;

(b) identified a fixed cost for comparison (based on the median value); and

(c) measured how far above or below this fixed cost each company's standard cost is.

4.36 Each company provided Ofwat with draft and final audited estimates for the standard costs based on, as far as possible, its own current and previous capital works programmes. Considerable effort was required to ensure that the cost base data were comparable and consistent with the specified information requirements. This involves a focused independent audit and review of the estimates by specialist consultants.

Ofgem: Quality of service Scorecard for Gas Distribution Networks[47]

4.37 In Ofgem's final proposals for the gas distribution price control review in 2007, Ofgem was of the view that making information available to the public incentivises management teams to focus on quality of service. With this aim in mind, Ofgem produces a "balanced score card" for the Gas Distribution Networks (GDNs). The scorecard takes the form of a table with two columns: activity and performance measure.

4.38 The score card contains information for the following indicators:

(a) gas supply – number of unplanned interruptions per 100 customers, average duration of interruptions, and accuracy of data submitted;

(b) gas safety – percentage of gas emergencies attended within prescribed timescales;

(c) accuracy of pipe-line records;

---

45 Setting price limits for 2010-15: Framework and approach
http://www.ofwat.gov.uk/pricereview/pap_pos_pr09method080327.pdf

46 Standard costs refer to the estimated capital cost of a specific "idealised" work item or project.

47 Gas Distribution Price Control Review, Final Proposals, 2007
http://www.ofgem.gov.uk/Networks/GasDistr/GDPCR7-13/Documents1/final%20proposals.pdf

(d) customer service – customer satisfaction survey results for repair, replacement, emergencies and connections;

(e) complaints – percentage of complaints responded to within prescribed timescales; and

(f) reinstatement – percentage of reinstatement jobs completed within prescribed timescales.

4.39 The different areas are not weighted to create an overall performance score for GDNs and there is no financial incentive attached to this measure.

4.40 The intention is that the collation of data in the same format for each GDN will allow for meaningful comparisons of performance between GDNs.

Ofcom: Monitoring BT's leased line charges [48]

4.41 In order to monitor BT's prices and assess if they are excessive, Ofcom uses international benchmarking. Ofcom compares the level of UK prices with the prices of leased lines for countries in the EC and beyond.

4.42 Ofcom notes that BT's prices could in principle be compared to its competitors, but data limitations make this approach infeasible. Ofcom would need to know the prices that both BT and its competitors charge in the retail market, but the only prices that are readily accessible are BT's published prices. Other Communications Providers (OCPs) tend to use bespoke pricing, making it difficult for Ofcom to form a view on a representative set of OCP prices.

4.43 Ofcom uses data from a report by the European Commission to compare the prices of leased lines of different lengths and different bandwidths offered by incumbents in Europe, North America and Japan. The prices are compared using simple charts with price along the y-axis and countries along the x-axis, along with an EU24 average price line. Prices are converted into a single currency using market exchange rates. The charts allow for general comments about BT's relative position compared to comparators in the other countries.

4.44 Ofcom also uses an OECD study to compare leased line prices in the UK with those of other OECD members as a cross-check on the conclusions drawn from the European Commission study.

---

[48] Business Connectivity Market Review, 2008
http://stakeholders.ofcom.org.uk/binaries/consultations/bcmr/summary/bcmr_pt3.pdf.
See also: http://stakeholders.ofcom.org.uk/consultations/bcmr/

4.45 Making use of data from previous studies means Ofcom has no data issues to contend with, in terms of either finding or cleaning the data. However, the short-coming of this is that Ofcom is not able to manipulate the data, even if it wanted to. For instance, in making these international comparisons, there are many factors for which it may be useful to adjust in order to make the comparisons more robust. Ofcom acknowledges that factors affecting prices may include:

(a) intensity of competition in a market;

(b) factors affecting the retail cost base, such as the level of competition in upstream markets;

(c) the level at which regulated wholesale charges are set;

(d) the prices of other inputs;

(e) the particular tax treatments of the entity supplying the service;

(f) entities' differing approaches to cost recovery;

(g) the services whose prices are being compared are not identical; and

(h) the fact that some incumbents may price their circuits differently with varying, often unpublished, discount structures.

ACCC: International benchmarks of Unconditioned Local Loop Service Band 2 charges[49]

4.46 The ACCC carried out international comparisons on access prices for the unconditioned local loop service (ULLS) when considering whether Telstra's (the incumbent's) proposed monthly access charge for "Band 2" (which relates to metropolitan areas) was excessive.

4.47 The ACCC considered charges in 14 other countries. ACCC compared raw charges and charges adjusted for purchasing power parity (PPP). The incumbent's proposed charge was compared to each of the comparators and compared to the average of this group. The draft decision also considered, at a high level, the effect of the density of the population, in the sense of which direction this should affect the charges (on the basis that charges would be expected to be lower in a more densely populated area).

4.48 From this comparison, the ACCC concluded that there was a "significant discrepancy" between the Proposed Monthly Charge and international benchmarks.

[49] ACCC draft decision on Telstra's ULLS Undertaking
http://www.accc.gov.au/content/index.phtml/itemId/848843

4.49 The ACCC received comments regarding the above approach being insufficient to draw valid conclusions. In its final decision, the ACCC commissioned an external consultancy (Ovum) to consider six adjustment factors: general regulatory framework, population density, land use, copper prices, loop length, and pricing structure.

4.50 Each of these adjustments was considered separately. For all of the adjustment factors, Ovum undertook broad comparisons by creating tables and charting the data with a line of best fit (for example, a chart of charges versus population per square kilometre). Conclusions were then drawn based on the position on Telstra on the chart.

4.51 Ovum makes the general comment that data are not easily available for comparative purposes. For example, they were unable to investigate land use because reliable data was not available.

Australian Energy Regulator: Victorian Gas Distribution Business Comparative Performance[50]

4.52 The Australian Energy Regulator (AER) produces a report which details the performance of the three gas distribution network service providers (DNSPs) in Victoria: Envestra, Multinet and SP AusNet. The report includes indicators related to the reliability of supply and customer service.

4.53 The purpose of these comparisons is to encourage competition between gas DNSPs by providing an incentive for DNSPs to improve performance relative to one another, and to provide customers with information about the services they are receiving.

4.54 Reliability of supply is a measure of the level of availability of gas supply to customers. The report considers performance indicators for the average customer's time off-supply, interruption frequency, number of outages on the supply network and major supply interruption events. The data are presented in the form of bar charts, with the indicator along the y-axis and data for the DNSPs along the x-axis. Historical data for each DNSP are included on the chart to look at trends for each DNSP across time, to take into account the fact that there can be significant short-term variations in reliability measures that are not directly related to changes in the condition of the gas supply network.

4.55 DNSPs are required to operate under the Guaranteed Service Level (GSL) payment scheme. This scheme requires the DNSP to make a payment to the customer if their performance falls below a certain threshold. For example, for appointments, the DNSP should arrive for an appointment with a residential customer within 15 minutes of the scheduled time, and if this threshold is not met then the GSL payment is $50 per event. The scheme intends to encourage DNSPs to improve their services. Current and historical data on the number of customer payments and the amount paid by each DNSP

[50] AER, Victorian Gas Distribution Business Comparative Performance Report 2008 http://www.aer.gov.au/content/item.phtml?itemId=736841&nodeId=9757a716e48b9cbc22aa66d1f597d4b2&fn=Victorian%20DNSP%20gas%20comparative%20performance%20report.pdf

are included in a table. Total GSL payments through time by the DNSPs are also plotted on a line chart.

4.56 The number of complaints is also assessed using simple metrics. A bar chart is used to compare the number of complaints received per 1,000 customers across DNSPs, which includes current and historical data. A line chart is used to compare complaints received for full investigation across the DNSPs through time.

4.57 This comparative performance report is based on information provided by the DNSPs on network performance and customer-service statistics, and complaint information supplied by the Energy and Water Ombudsman (Victoria) (EWOV). All gas DNSPs are required to undertake an independent compliance audit in accordance with the Essential Services Commission of Victoria's (ESCV) Gas Industry Guideline. The audit report, prepared by the AER, concluded that overall businesses achieved a ±5 per cent or better accuracy with regard to the service performance indicators, which was deemed to be a reasonable level of accuracy by the AER.

Analysis of approach

Pros

4.58 One of the key advantages of using simple metrics is that, because they are less complex than some other techniques, they are more transparent and easy for stakeholders to interpret, understand and replicate.

4.59 The simplicity of this technique also means that there is little difficulty in implementation, and there is generally no need for specialist training or the commissioning of specialist consultants.

4.60 Using simple metrics allows for relatively straightforward sense-checking of the data, which can be used to determine whether further analysis needs to be undertaken.

Cons

4.61 Whereas the simplicity of these approaches is an advantage on the one hand, the downside is that they may be too simplistic to be relied on in many circumstances. In particular, it may be difficult to account for factors outside the firms' control when comparing performance using simple metrics.

4.62 Although simple to implement in practice, significant effort may be required by the regulator to clean the data in order to make them comparable. In cases where it is not possible to normalise the data, it may not be possible to make meaningful comparisons using simple metrics.

Applicability to Ofwat

Data issues

1.2 The extent of any data issues arising when using simple metrics will depend on what is being compared, the type of simple metric used to make the comparison, and the weight the regulator intends to place on the results. For example, the use of unit cost comparisons to assess the relative efficiency of firms' capital expenditure may require significant effort to ensure that the data are comparable, since the regulator has to be confident that companies have compiled their costs in a way which is consistent with often quite detailed information requirements. By contrast, a table presenting the results from a customer satisfaction survey administered by the regulator, for example, may require little cleaning of data.

Potential value of comparisons

4.63 Simple metrics can be used to make useful comparisons in a wide range of areas, and hence are likely to be of significant value to Ofwat. However, the results will sometimes need to be interpreted with caution; and further, more detailed analysis may sometimes be required.

4.64 Simple metrics are low in complexity relative to other more rigorous quantitative techniques, allowing for comparisons to be made which are transparent and easy for stakeholders to interpret and understand. The simplicity of this technique also means that there is generally no need for specialist training or the commissioning of specialist consultants. However, the burden of regulatory compliance would not necessarily be lower for water and sewerage companies than would be the case if the data provided were used for more rigorous quantitative techniques.

4.65 The use of simple metrics can act as a useful sense-check on results obtained from more technical quantitative techniques (e.g. the use of regressions for top-down benchmarking of operating expenditure). Hence, Ofwat could make use of such comparisons to sense-check results, and consequently to determine whether further analysis needs to be undertaken.

Impact of potential market reform

4.66 For parts of the value chain opened to competition, comparisons using simple metrics may play a useful role in a lighter-touch approach to regulation as competition develops. For example, this could be the case in sludge treatment and disposal where there may be no price regulation, and in other stages of the value chain if competition developed to the stage where formal price regulation could be removed. In these cases, simple comparisons (e.g. of price, quality, or customer complaints) could be used for the purpose of monitoring the behaviour of firms within the market. Such monitoring could be used to identify specific cases in which regulatory investigation and intervention may be appropriate (perhaps using Competition Act powers).

4.67 Separate price controls for resources and network plus (or non-binding separate price controls within a "wholesale" business price control) could allow Ofwat to employ simple metrics to make comparisons that reflect the nature and specificity of different stages of the value chain. The results of these comparisons could be used to create incentive schemes that are specific to each stage of the value chain. Simple metrics, such as unit cost comparisons for capital expenditure, could still be used by Ofwat under a global "wholesale" price control, but it may be more difficult to use the resulting information on relative efficiency to create differing incentives for capex efficiency improvements for different stages of the value chain. Under both options, care would still need to be taken to ensure that the data used are comparable in order for the comparisons to be meaningful.

4.68 If potential market reform leads to differences in the vertical disaggregation of firms, this may lead to an increase in the heterogeneity of firms (i.e. firms may have more varied business plans and operating practices). This would make comparisons using simple metrics more difficult to interpret, because it is difficult to take firm-specific factors into account when making simple comparisons.

4.69 Simple metrics may be a valuable technique when assessing the relative performance of the system operation functions within the network business, when a lack of historic data and limited understanding of the key drivers of performance may make more sophisticated comparisons difficult. More rigorous techniques could then potentially be used in the future.

Index numbers

Description

4.70 An index converts data into a convenient form for comparing the relative changes in a set of measurements through time, or for comparing levels of the variable being measured across companies, sectors or countries. Index numbers express the difference between measurements by designating one number as the "base" and expressing the other measurements relative to this. The numbers themselves have no meaning and no units; the numbers allow relative comparisons to be made between the measurements.

4.71 For example, a regulator could aggregate data on different aspects of company performance into an index where each company is assigned an overall value for its performance relative to the performance of the other companies in the comparator group. This can be used where there are data on several aspects of company performance in order to ease comparison for the regulator and the consumer.

4.72 Index number techniques are often carried out to compute productivity growth measures. They can be used for analysing the performance of individual economic units (for example, firms or sectors) across time or to compare productivity levels of different economic units at a single point in time. The most common index used in the empirical literature to assess total factor productivity (TFP) growth rates is the Tornqvist index which

measures the ratio of all outputs to all inputs, using revenue and cost shares as the output and input weights, respectively.

4.73 Multilateral indices are generally calculated in order to compare the total factor productivity of different economic units, taking account, to some extent, of the different "economic environments" firms operate in.

4.74 An established approach to measuring productivity changes in multi-input, multi-output contexts is to use Malmquist indices computed with data envelopment analysis (DEA). Panel data are required for this approach.[51] Malmquist indices allow a company's productivity change over time to be decomposed into a frontier shift (i.e. an industry-wide productivity change over time) and a catch-up effect (i.e. a company's productivity relative to other companies in the industry).

4.75 More generally, a range of indices can be used to aid comparisons. One can construct price indices in order to compare the relative prices charged. An index number can be constructed through weighting the prices offered to different customer groups by the size of the customer group. This can be done to construct a price index in order to track prices across countries through time – for example, by choosing one country as the base for comparison and calculating comparative price indices for the other countries. A price index could also be constructed across domestic companies, following a similar weighting process to take into account different customer groups.

4.76 Indices can be used to assess the extent of competition in a market. One such widely used index is the Herfindahl-Hirschman Index (HHI). The HHI is constructed using estimates of the concentration within industry, based on the sum of the squares of the percentage market shares of each player in the market. It can range from 0 to 10,000, with a very low number meaning the market contains a large number of very small firms, whilst 10,000 indicates the presence of a single monopolist.

4.77 In addition to the types of indices mentioned above, it is possible to construct a more subjective kind of index to measure almost anything. For example, one could construct a "liberalisation index" based on assessing how liberalised a market was against a number of different criteria, and weighting them to produce an overall index. Similarly, it is possible to construct indexes to compare other aspects of performance, such as security of supply and sustainability.

4.78 Some examples of the use of index numbers are presented below.

---

[51] Panel data refers to data on an economic variable that include both multiple economic units and multiple time periods, thus displaying both cross-sectional variation and time-series variation

Practical examples

Ofwat: Security of Supply performance[52]

4.79 Ofwat has used a security of supply index to assess each company's compliance with its duty to ensure the security of its water supplies. This index has also been used to assess water resource, leakage and demand management issues in a wider context, and to track changes in the service that companies offer to consumers over time.

4.80 The index is based on the difference between available headroom and target headroom. Ofwat defines headroom as the difference between the amount of water a company has available to supply (water available for use) and the volume of water it expects to introduce into its network (distribution input) to meet demand. Target headroom is the minimum buffer between supply and demand that a company should allow for in order to cater for specified uncertainties, such as a water resource producing less water than expected. Population figures for each zone are also taken into account.

4.81 The index results for all companies are presented in a table. Ofwat bands the security of supply index scores rather than presenting absolute values to emphasise that the index is an estimate of the company's security of supply based on a number of variables. The bands are as follows:

- A: no deficit against target headroom in any resource zone (index score 100);
- B: marginal deficit against target headroom (index score 90 to 99);
- C: significant deficit against target headroom (index score 50 to 89);
- D: large deficit against target headroom (index score below 50).

4.82 Along with the index band, the results are displayed using different shades of blue for each band (i.e. light blue for A and dark blue for D). Ofwat also assigns a rank to the companies based on planned level of services, with those in band A being assigned a rank of 1.

The Office of Energy Regulation (Energiekamer): Benchmarking TenneT[53]

4.83 TenneT is the transmission system operator (TSO) in the Netherlands. The Dutch Office of Energy Regulation (Energiekamer) commissioned a study to assess the cost efficiency of TenneT.

---

[52] Security of Supply 2006-07 report
http://www.ofwat.gov.uk/regulating/reporting/rpt_sos_2006-07secofsupplymain.pdf

[53] Agrell, Bogetoft, Project Stena, Benchmarking TenneT EHV/HV Final Results (2010)
http://www.energiekamer.nl/images/Report%20stena%20open%20final_tcm7-135477.pdf

4.84 The assessment of transmission operations consisted of benchmarking covering both the current cost efficiency level of TenneT and the cost efficiency development rate of comparable operators. The second part of this exercise, the dynamic efficiency analysis, estimated the frontier shift. Frontier shifts are sector-wide changes of the productivity level.

4.85 The authors undertook several investigations into the frontier shifts. Estimates of frontier shifts were conducted separately on each of the following datasets: European TSOs, 51 Norwegian Regional Transmission Operators (RTOs) for 2001-2004, and 139 US RTOs for 1994-2005. The methodology was based on the premise that the change in the level of the frontier is likely to be uniform, and also that the usual problems of structural comparability (e.g. validation of task base, asset base standards) are less important. In addition, the authors considered that since the datasets for Norwegian RTOs and US RTOs referred to entities in the same country, problems associated with making international comparisons would be eliminated.

4.86 The authors calculated the Malmquist Index for the Norwegian data and the US data. Country-specific factors were considered in interpreting the frontier shift and catch-up. For example, in the Norwegian case the authors considered that the fact that the RTOs had been under a high-powered regime for several years suggested that the frontier shift was not simply a transitional or a data quality phenomena.

4.87 Statistical validation of the US data showed poor consistency, so cleaning was necessary including the use of ratio filters (e.g. energy/peakload< 8760 h) and outlier detection and removal. Malmquist decomposition assumes constant return to scale, which means that the small and large units should be comparable. In this dataset, there was considerable variation in the size of networks and different models had to be run to check the validity of this assumption.

4.88 Malmquist indices were calculated for every unit and every subsequent pairs of years, e.g. from 1994 to 1995, from 1995 to 1996, and so on, up to 2005. The Malmquist index for every unit was decomposed into a frontier shift and catch-up. Averages were calculated across units, both in simple arithmetic form and in cost-weighted average form. The yearly changes were then averaged over the periods. Inflation also had to be carefully adjusted for in the estimation of frontier shift, using price indices from the US Bureau of Labor Statistics (the consumer price index and labour index). This work resulted in an interval estimate which encompassed the estimates from analysis conducted on the three datasets. This was then used to draw conclusions on the frontier shift in the electrical TSO and RTO industry, and therefore to inform the appropriate frontier shift for TenneT.

Analysis of approach

Pros

4.89 The use of index numbers to make comparisons can be a relatively simple and flexible technique.

4.90 It is possible to accommodate, at least in part, differences in the companies' operating environment (e.g. the area's population density) so that some companies are not unfairly penalised.

4.91 The robustness of index number theory does not rest on the availability of a large sample size, and it may therefore be particularly relevant when the regulator regulates only a few firms and decides not to use international comparators.

4.92 TFP growth rates in a sector can be easily compared to those in related sectors or the economy as a whole.

4.93 Malmquist indices can be used to decompose efficiency improvements into frontier shift and catch-up, unlike the Tornqvist index. They allow analysis to be carried out on TFP trends over time and on whether there is convergence towards the frontier.

4.94 Index number techniques can be used to cross check the results of DEA and regression analysis. This involves comparing the results of the multilateral indices of opex productivity with the efficiency scores of the DEA and regression models, to ascertain whether or not they tend to produce similar results in terms of efficiency levels and efficiency rankings. The comparison of the results produced by alternative methodologies can be useful in top-down benchmarking exercises as it adds further transparency and credibility to the process.

4.95 Constructing a price index in which the prices charged are weighted by the size of the customer groups can make comparisons easier where there are several customer groups. For example, in any one country some customer groups may be charged higher prices and other customer groups charged lower prices than in other countries. Constructing an index removes the problem of comparing a large number of individual results which could potentially lead to no clear conclusions about how prices compare overall. This also allows prices to be compared across countries through time which might be useful, for example, in assessing the impact of market reform.

Cons

4.96 The main drawback of the index number methodology is that it is a non-statistical technique, and so there is no possibility of conducting statistical inference using this approach nor is it possible to evaluate the uncertainty surrounding the results. It also does not control for all variables that might affect costs and, therefore, efficiency.

4.97 The disadvantages of using Malmquist indices include the need for panel data. There are also issues around assuming constant returns to scale. Further, the results can be sensitive to the choice of inputs and outputs.

4.98 There are several drawbacks to using price indices. There could be problems with ensuring the comparability of the prices compared – for example, because of different ways in which products and services are bundled. It may be difficult to ensure that the price information is accurate if firms frequently put together bespoke packages for

customers. Making international comparisons requires conversion of prices to a common currency, and different results will be obtained depending on whether market exchange rates or exchange rates based on Purchasing Power Parity (PPP) are used. When comparing prices across time, the choice of whether the exchange rate is taken at one particular point in time or smoothed over a longer time-period (e.g. averaged over a number of years) will also affect the results of the comparisons.

Applicability to Ofwat

Data issues

4.99 Different approaches to index numbers have quite varying data demands. For instance, constructing an index to make comparisons of a particular aspect of firm performance (e.g. security of supply) may only require a relatively small number of data points from water companies. However, using Malmquist indices requires panel data, and it may be harder both to gather this data and to ensure it is comparable. As discussed above, price indices may also raise data comparability issues and it may be resource intensive to gather and clean the data.

Potential value of comparisons

4.100 Indices can have a value in monitoring the market for aspects where relative performance of firms is the important issue. The flexibility of the approach lends itself to comparisons across a range of indicators.

4.101 Cross-checking the results obtained from DEA and regression analysis with other benchmarking techniques would add to the overall robustness of the results. In particular, index numbers are less sensitive to the small sample size problems that affect both DEA and regression analysis.

Impact of potential market reform

4.102 Using multilateral indices may be of value to Ofwat in future price reviews to inform frontier shift assumptions, potentially in conjunction with other techniques for assessing cost efficiency, such as bottom-up modelling, econometric regressions and/or DEA.

4.103 Indices could be used by Ofwat to monitor the performance of firms if potential market reform is implemented. For example, index methodologies could be constructed in order to compare the performance of firms in relation to quality of customer service, environmental performance or security of supply. Publishing this information could provide a reputational incentive for firms to improve their performance relative to their peers, particularly for firms operating in parts of the value chain opened to competition.

4.104 In the long term, multilateral indices could be used to examine the effect of introducing competition on productivity growth, and international comparisons may be of interest here depending on the data which are available.

4.105 Finally, the Herfindahl-Hirschman Index (HHI) could be used to assess changes in the level of competition in the market, as part of wider reviews of competition.

Regression Techniques

Description

4.106 Regression techniques can be used for benchmarking purposes in order to assess the efficient level of costs or to compare other aspects of performance. Regression analysis involves the use of certain statistical techniques to compare the performance of companies operating in the same market (or companies operating in similar markets), controlling for certain explanatory variables. These techniques have typically been used in the past to assess the relative cost efficiency of individual companies and to help to identify the scope for improvement which can then be reflected in the regulatory framework. However, regression techniques can in theory be used to compare outcomes across companies in relation to other aspects of performance.

4.107 Regression techniques define relationships between a dependent variable (e.g. the company's costs) and several explanatory variables which "explain" the costs, in order to derive the efficient level of costs; and, therefore, the scope for efficiency improvements.

(a) Ordinary Least Squares (OLS) techniques can be used to perform benchmarking that relates individual firm performance to the expected level of performance. This is done for each firm in the industry, and the difference between predicted costs and actual costs is interpreted as a measure of relative performance.

(b) Corrected Ordinary Least Squares (COLS) techniques involve shifting the line representing the relationship between actual performance and the explanatory variables towards the best performing company. This is based on the presumption that the best performing company defines efficient costs and on the assumption that the estimated OLS regression is still valid at the frontier, and that residuals only capture inefficiency and not random noise, omitted variables, functional form, or misspecification of the regression.

(c) A further technique that is widely used is Stochastic Frontier Analysis (SFA) which attempts to estimate an efficient production possibility frontier. In the context of technical efficiency, SFA estimates a production (or cost) function indicating the maximum attainable output (or minimum costs) given the particular inputs. This technique incorporates the possibility of measurement error or factors related to chance in the estimation, i.e. any lower performances can be traced back to random noise as well as inefficiency.

4.108 When using regression techniques, data for a single year can be used to assess how efficient one firm is compared to others. However, depending on the number of firms for which data are available, such analysis can have limitations with regard to accuracy and robustness. If data are available for a number of years, it is possible to create a data

panel which includes data for different companies over a number of years, and panel data regression techniques, which take account of time trends, can be employed.

4.109 It is not always necessary to choose between alternative techniques, since these techniques can be used alongside each other. However, it is important to note that different efficiency estimation methodologies can yield significantly different results in terms of both efficiency rankings and levels.

Practical examples

Ofwat: Operating expenditure efficiency analysis[54]

4.110 Ofwat has made use of comparators for annual monitoring of water companies' relative efficiency on operating expenditure. At price reviews, Ofwat has used its assessment of efficiency in the base year to calculate the catch-up efficiency rate to be applied to companies' operating expenditure included in price limits.

4.111 Ofwat used a Corrected Ordinary Least Squares (COLS) model to assess the relative efficiencies of companies' operating expenditure. Ofwat carried out the modelling at a functional level and then each of the models was combined at a service level. The benchmark company for each service is chosen carefully to ensure that the cost structure of the benchmark company is representative of the industry.

4.112 At the level of the combined model, Ofwat made post-modelling adjustments to ensure consistent comparisons by taking into account differences in operating circumstances that cannot be included in the modelling. These included, for example, atypical costs, regional salaries and opex-capex interactions. In addition, at the combined model stage, Ofwat reduced the percentage residuals by 10 per cent for water and by 20 per cent for sewerage to account for the possibility of stochastic error.

4.113 The models used company data collected through the June returns in order to carry out the relative efficiency modelling. Ofwat spent a considerable amount of time querying companies in order to clean the data. The quality of the data is very important because the inclusion of a company as a benchmark will affect all the other companies' relative efficiency results; therefore, the inclusion of poor data will potentially skew all the results. To this end, Ofwat has criteria that a company must satisfy in order for it to be used as a benchmark company.

4.114 The use of regression techniques for comparative analysis of operating expenditure efficiency is useful because it allows Ofwat to make a quantitative assessment of the scope of efficiency gains that can be achieved by water and sewerage companies. The

[54] Ofwat: Final determinations on price limits, PR09
http://www.ofwat.gov.uk/pricereview/pr09phase3/prs_web_pr09fd

use of comparisons in this context also provides companies with an incentive to efficiently manage their operating expenditure.

Ofgem: Operating expenditure efficiency analysis[55]

4.115 In the 2007 price review for gas distribution networks (GDNs), Ofgem made use of regression analysis to assess the scope for efficiency savings by GDNs. Following the sale of four of the GDNs by National Grid Gas in 2005, this was the first time that Ofgem has been able to make meaningful comparisons between GDNs.

4.116 Ofgem's overall approach was to assess the efficiency of the GDNs, by benchmarking the efficiency of individual activities within direct and indirect operating cost areas where it was practical to do so. Ofgem carried out more specific analysis for those areas where benchmarking was not practicable or if the benchmarking results were not considered to be robust. Ofgem's combined approach of making use of both disaggregated and top-down analysis means that the overall level of allowances are determined by the top-down analysis, but the detailed benchmarking determines the allocation of allowances between GDNs.

4.117 The main reason for carrying out the benchmarking at an individual activity level was to increase the number of data points. If the analysis of total operating costs had been carried out, only eight data points would have been available (or possibly four if ownership groups were used). In addition, given the timing of GDN sales, there would only have been two years of data that could be used to determine any trends.

4.118 The direct operating activities benchmarked were: work management, emergency, repair, maintenance, and other direct opex. The costs were benchmarked based on the upper quartile of performance, i.e. using the lower-cost GDNs. These costs were then rolled forward to take account of the forecast number of repairs, Ofgem's assumptions on ongoing efficiencies, and real growth in the cost of contract labour, direct labour and materials.

4.119 Ofgem recognised in their final proposals that a potential weakness of benchmarking at the upper quartile level of costs for each individual activity is that it creates a benchmark that is not currently achieved by any GDN. Ofgem addressed this issue by applying anuplift on their disaggregated cost forecasts, based on the average difference between Ofgem's disaggregated benchmarks and the top-down opex benchmarks based on the upper quartile level of performance.

---

[55] Ofgem: Gas Distribution Price Control Review, Final Proposals, 2007
http://www.ofgem.gov.uk/Networks/GasDistr/GDPCR7-13/Documents1/final%20proposals.pdf

ORR: International cost efficiency benchmarking of Network Rail[56]

4.120 Regression analysis is used by the ORR to assess the scope for Network Rail to improve its cost efficiency. The results are used to establish levels of access charges at a periodic review of Network Rail's outputs and access charges.

4.121 Network Rail is a single national monopoly, therefore the use of international benchmarking is necessary. This makes the benchmarking work more difficult, in particular to ensure that the comparisons are conducted on a like-for-like basis. The ORR uses the International Union of Railways' (UIC) "lasting infrastructure cost benchmarking" (LICB) dataset as input to the econometric analysis undertaken. This dataset comprises maintenance and renewals expenditure and other data for a total of 14 European rail infrastructure managers (of which we used 12), including Network Rail, for the period from 1996 to 2008.

4.122 The LICB dataset collects and provides data in a common format, therefore not much cleaning of the data is required. However, ORR performed its own checks and corrections by filling gaps in the data (mainly by interpolation) and omitting non-credible observations. In addition, in order to make the cost data comparable, ORR adjusted the data to a common currency using purchasing power parity (PPP) exchange rates and converted them into constant prices, deflated back to German currency at the base year (1996).

4.123 The default technique employed by ORR is stochastic frontier analysis (SFA). In addition, cross-checks were carried out using Corrected Ordinary Least Squares (COLS) and Data Envelopment Analysis (DEA). ORR tested a variety of cost-function models combining different cost drivers to explain total maintenance and renewal cost. The preferred explanatory model considers total maintenance and renewal expenditure (cash cost) to be explained by route km (network size), passenger train density (measured as passenger train km on the main line network), freight train density (measured as freight tonnage on the main line network), the proportion of single track on total track km, and a time variable to capture technological progress.

4.124 The preferred model is based on total maintenance and renewal cost. This is for the trade-offs between maintenance and renewals, and any accounting differences between countries in the way in which they record maintenance and renewal costs, to be taken into account.

4.125 In PR08, ORR recognised that the available data for the econometric analysis did not enable detailed explanation of all of the differences between Network Rail's cost base and that of its peers. Considerable effort was undertaken to understand from a qualitative and

[56] ORR: Annual efficiency and finance assessment of Network Rail 2009-10
http://www.rail-reg.gov.uk/upload/pdf/nr_efficiency_assessment_0910.pdf

quantitative perspective the factors driving the results, including engineering and statistical issues. The results of this work confirmed that the results of the international econometric benchmarking work were robust.

The Office of Energy Regulation (Energiekamer): Assessment of factors that may cause regional differences in costs[57]

4.126 In 2006, the Dutch energy regulator (formerly DTe) employed consultants to examine certain factors that may cause regional differences in costs among gas and electricity distribution network companies. The analysis used a two-stage approach:

(a) Step 1 sought to determine whether a regional difference could be significant on the basis of all the data (submitted by the companies), without considering whether to exclude certain data due to the lack of an endorsement from independent auditors or because of the failure to follow the instructions in the data requests.

(b) Step 2 looked at the potentially significant regional differences, and analysed the data submitted in compliance with the data requests, and which received appropriate endorsement from independent auditors.

4.127 The regional difference factors were divided into those that could be quantified separately and those that should be analysed together with a statistical analysis. The following regional differences were quantified separately: water crossings, distributed generation, salty air, taxes, road diversions, procurement of energy and capacity, consumer behaviour/write-offs, and adjusting the composite output for peak load. The companies provided either direct cost estimates, or information relevant to engineering inputs which were then used to estimate costs, for each of these factors. The following regional difference factors were analysed together (because it is difficult to isolate the impact of these regional differences on the total costs of the companies): connection density, soil quality and the degree of urbanisation.

4.128 In Step 1, the magnitude of potential regional differences was assessed. In Step 2, those factors that are potentially substantial were considered. Regression analysis was used to assess whether these regional differences were significant or not. The statistical analyses were limited to the data that independent auditors endorsed, and that complied with the instructions in the data request.

4.129 The report concluded that there are only two regional differences that can be determined reliably: water crossings and taxes. However, the report acknowledged that the poor quality of the data prevented conclusions being drawn as to whether some of the other potential factors were regional differences.

---

[57] Office of Energy Regulation (Netherlands): Regional Differences for Gas and Electricity Companies in the Netherlands, 2006 http://www.energiekamer.nl/images/Addendum%20%20E%20Method%20Decision%20RNB%20E%20X-factor%20102106-89_tcm7-94489.pdf

Analysis of approach

Pros

4.130 The principal advantage of using regression techniques to assess levels of performance and to provide an assessment of the scope for improvements in performance, is that they reveal information about the drivers of performance and provide a quantitative estimate of efficient performance levels. With regard to cost, the use of regression analysis allows costs to be separated from the impact of exogenous variables, so that the only the portion of costs potentially under the control of each firm is considered in determining the price cap.

4.131 Regression techniques also allow the regulator to distinguish between the effects that different variables have on performance. The regression coefficients, i.e. the results of the regression analysis, can be interpreted as the extent to which different variables act as drivers of performance.

4.132 A further advantage of SFA techniques is that noise in the data can be accounted for, thus reducing the impact of measurement error and omitted variables that might arise in an (C)OLS framework.

Cons

4.133 A major drawback of the application of regression techniques is that a large dataset is required in order to produce reliable results. This can be particularly difficult if the number of comparators available is limited; a trade-off can arise between including more comparators and the comparability of comparators because although additional comparators will increase the robustness of the results, these comparators may not necessarily be appropriate as benchmarks. The use of panel data could alleviate this problem; however, it would not eliminate it altogether.

4.134 Another disadvantage of regression techniques is that the results are often sensitive to the functional form of the models, and it may not always be straightforward to specify the functional form of the model. If the regulator has a sufficiently large sample of firms in the dataset, there are sufficiently flexible functional forms available, e.g. translog functions that should make functional form issues less important. A further drawback of COLS techniques is that the results are sensitive to the existence of outliers in the dataset, since the best performing company will act as the benchmark.

Applicability to Ofwat

Data issues

4.135 Ofwat has employed regression techniques to conduct operating expenditure efficiency analysis, and to a lesser extent to assess capital maintenance efficiency. Ofwat currently collects a considerable amount of data through the June returns, although at present all of this information is not used in the models. For example, data on functional expenditure

collected by Ofwat are broken down into several categories of cost to help Ofwat understand the allocation of costs and year-on-year cost changes; however, this information has not been used in the regression analysis. If benchmarking were carried out at a more granular level, Ofwat could potentially use these data in the regression analysis. The benefit of using a more granular approach is that Ofwat could implement an approach similar to a bottom-up approach in which each activity is benchmarked. However, this could also create problems, such as:

(a) variations in accounting conventions may be greater when data are considered at a more granular level, which will create noise in the estimation and raise the likelihood of introducing measurement error into the regression analysis;

(b) regression analysis carried out at a more granular level may also neglect cost synergies between different activities.

4.136 As mentioned above, a lot of time is spent querying the data in order to clean them (with regard to both operating expenditure and capital maintenance expenditure) which can be burdensome for the regulator and the companies.

Potential value of comparisons

4.137 Despite the burden involved in collecting and cleaning the data, the use of comparators in regression analysis is still a useful regulatory tool as it allows Ofwat to assess quantitatively the efficient level of costs by comparing the efficiency levels of water and sewerage companies. The use of this data in regression analysis makes use of the private information that the water companies have on their costs, and is thus capable of reducing the information asymmetry faced by the regulator and, provided the benchmark is not too lax, the incentive properties of a regulatory framework based on top-down benchmarking using regression techniques are good.

4.138 The results of the analysis also enable Ofwat effectively to challenge companies' business plans because the results of the regression analysis provide an overview of the relative efficiency of each company. At the PR09 Ofwat assessed that, up until 2009-2010, relative efficiency challenges on operating expenditure and capital expenditure have kept average annual bills £110 lower than they would have been otherwise.

4.139 Under the current merger regime all mergers between water companies with UK turnover of over £10 million are subject to mandatory reference by the OFT to the Competition Commission. If the changes to the merger regime proposed in the Cave Review are adopted by the UK Parliament and the Welsh Assembly, whereby retail-only mergers are removed from the requirement of automatic reference and the turnover threshold for other mergers is raised to £70 million, there will be less scrutiny of the impacts of a loss of comparators resulting from mergers. This less restrictive approach may result in an increase in the number of mergers taking place, and a subsequent decline in the number of comparators available to Ofwat. This may make the results of regression analysis less robust.

Impact of potential market reform

4.140 Comparative efficiency analysis for costs will potentially become less relevant for parts of the value chain opened to competition, particularly once competition has become established such that price regulation can be removed, as may be the case for sludge treatment and disposal. During the transition to fully competitive markets, comparative efficiency analysis may still be important. Potential market reform may lead to new entry into competitive parts of the value chain, and this may increase the robustness of regression techniques to assess efficiency as there will be more comparators available.

4.141 In terms of quantitative assessment, Ofwat's relative operating expenditure efficiency models are easily influenced by changes in industry structure and reporting, given that they are calculated at a functional level to begin with and then combined at the service level. Therefore, in the event of changes to industry structure as a result of potential market reform, Ofwat's approach to efficiency adjustments would potentially have to be reconsidered (or changed within the existing framework).

4.142 In particular, the separation of price limits for water resources and network plus may impact the way in which regression techniques are applied in order to assess efficiency (whether these separate price limits are binding or are used to inform indicative pricing within a "wholesale" price control); although there may be little change in the current approach if a global control for the "wholesale" business is adopted. The system operation functions, however, may require additional models to be developed given the nature of system operation compared with other parts of the value chain.

4.143 In principle, different industry structures might have an impact on the reliability of comparisons using regression techniques. If some companies vertically disintegrate as a result of the potential market reforms, there may be an increase in the heterogeneity of firms; and, therefore, an increase in the heterogeneity of the comparators which would reduce the comparability between data points used in the regression analysis. Radical changes in the industry structure might also prevent the application of panel data techniques for some time, since current and historic datasets may not be comparable.

Data Envelopment Analysis (DEA)

Description

4.144 Data envelopment analysis (DEA) is a technique that can be used for benchmarking purposes in order to assess the efficient level of costs and the scope for efficiency improvements, or to compare other aspects of performance.

4.145 DEA is a non-parametric technique[58] that uses linear programming[59] to calculate the efficient frontier of a sample. The firms that make up the frontier envelop the less efficient firms. DEA models can be input- or output-based, and can be specified as constant returns-to-scale or variable returns-to-scale. Output-based models maximise output given certain input factors, whereas input-based models minimise the input factors required to achieve a certain level of output.

4.146 DEA models calculate the efficient frontier given certain inputs and outputs. The choice of appropriate input and output variables is of key importance when using DEA techniques. The variables should reflect the main aspects of resource use in the activity concerned. Exogenous factors that are beyond the control of the firms in the sample which can affect their performance can also be taken into account (these are known as environmental variables).

4.147 There are a number of approaches to taking environmental variables into account. A simple approach is a two-stage procedure in which DEA is run using certain inputs and outputs in the first stage; and, in the second stage, the efficiency scores are regressed on environmental variables to separate them from the operating environment. A recent approach discussed in the academic literature is to conduct a three-stage procedure which combines DEA and regression analysis. In the first stage, efficiency is analysed using only inputs and outputs; in the second stage, Tobit regressions are used to explain the variation in input slacks indices (which show where excess inputs are being used) derived in the first stage of analysis using DEA; and finally, in the third stage, a DEA model is re-run adjusting the inputs for the impact of the environmental variables. A major advantage of this approach is that it allows the regulator to test for the importance of the environmental variables in question.[60]

Practical examples

Ofcom: The comparative efficiency of BT Openreach[61]

4.148 Ofcom commissioned consultants to carry out a comparative efficiency assessment of BT Openreach. In particular, the focus of the assessment is on those BT Openreach activities which are involved in providing wholesale line rental and unbundled local loop services. In order to assess the efficiency of Openreach, a benchmark dataset was used comprising data on costs, network size, environmental and quality of service variables for approximately 70 US local exchange companies (LECs) for the years 1999 to 2006.

---

58 Non-parametric techniques refer to approaches that do not rely on data belonging to any particular distribution.

59 Linear programming refers to the maximisation or minimisation of a linear function subject to linear constraints.

60 Renzetti and Dupont (2009) show using this approach that, in the water industry, firms' relative efficiency scores are changed substantially after accounting for environmental variables. Renzetti, and Dupont, Land Economics, 85, 4, 627-636, 2009

61 Ofcom: The Comparative Efficiency of BT Openreach, 2008
http://stakeholders.ofcom.org.uk/binaries/consultations/llcc/annexes/efficiency.pdf

4.149 The activities which Openreach performs are a subset of the BT network, and of the activities for which US LECs report their costs. It is therefore not possible to compile data for the LECs and the Openreach activities on a basis that allows direct comparisons to be made, because even the disaggregated cost information for the LECs includes a substantial number of items where the costs of operating the core network and access network are combined.

4.150 To address this issue, Ofcom analysed the efficiency of two Openreach "pseudo-companies". The first pseudo-company closely resembles the wholesale line rental and unbundled local loop services of Openreach.[62] The second pseudo-company adds back the identifiable costs of providing leased lines (excluding transmission equipment) in order to create an entity that more closely resembles the LECs after removing their switching and transmission equipment costs.

4.151 In addition to stochastic frontier analysis (and generalised least squares regressions), DEA was also used to measure the efficiency of both versions of Openreach. The DEA analysis was done using the same explanatory variables as the regression analysis, as the statistical validity of including these variables in a total costs model had already been established.

4.152 Using these variables, DEA was unable to find peers to compare against the total costs of either version of Openreach in 2006. This could have been for one of two reasons:

(a) it could be that the company is 100 per cent efficient; or

(b) DEA is unable to find comparable firms within the sample against which to assess the efficiency of the firm.

The Office of Energy Regulation (Energiekamer): Cost Efficiency of TenneT Transmission System Operator[63]

4.153 TenneT is the transmission system operator in the Netherlands. The Dutch Office of Energy Regulation (Energiekamer) commissioned benchmarking of transmission operation activities in order to estimate two efficiency improvement parameters in the revenue cap for TenneT: the individual efficiency catch-up target and the expected annual productivity increase. The benchmarking makes use of the e^{3}GRID study which has standardised information on electricity transmission grids in 19 countries.

4.154 In e^{3}GRID, two benchmarking techniques are used: unit cost comparisons and DEA. A shortcoming of the unit cost comparisons approach is that the use and location of the grid

---

62 Line cards are removed from the pseudo-company to allow a more direct comparison with the LECs. (A line card interfaces the telecommunication lines coming from the subscribers to the rest of the telecommunications access network.)

63 Project STENA, Benchmarking TenneT EHV/HV, Final Results, 2010
http://www.energiekamer.nl/images/Report%20stena%20open%20final_tcm7-135477.pdf

is not represented in the metrics. To address this issue, the DEA model has three cost drivers to explain cost differences better.

4.155 However, the regulator's preferred method for assessing the efficiency of TenneT is the unit cost approach due to a number of drawbacks with the DEA analysis. One of the cost drivers for the DEA in e^{3}GRID is density, calculated as population density. Since the Netherlands has the highest population density among the countries represented in the sample, the DEA method exaggerates the impact of this cost driver to explain any cost difference, unless a comparator is found. The regulator also employed statistical methods to detect any observations that are atypical, or observations that may unduly influence the estimation of the comparator firms' efficiency. This process leads to the further removal of observations, which in combination with the small dataset makes it more difficult to estimate, using DEA, the extra cost necessary to operate in a highly populated country. As such, the report uses the results of the DEA to validate the unit cost comparisons.

4.156 The regulator used four DEA models to analyse the efficiency of TenneT: two total expenditure models, a capex model and an opex model. The scores are presented as best-practice, best-of-three practice, and average practice. The best-practice results are sensitive to data on the best-performing firms, but are insensitive to poor data from inefficient firms. The average-practice results are robust to random errors in the unit data, but are sensitive to the inclusion of inefficient units.

Analysis of approach

Pros

4.157 The main advantage of DEA is that it is able to accommodate a multiplicity of inputs and outputs, and it is less reliant on the availability of a rich sample size. It is also useful because returns to scale can easily be taken into account when calculating efficiency, therefore allowing for increasing or decreasing efficiency depending on the size of the firms in the sample.[64]

4.158 A further advantage (compared to regression techniques) of DEA is that it only requires general production and distribution assumptions. Therefore, there is no need to specify a functional form for the production function. It is also not necessary to specify the distribution of inefficient deviations from the efficiency frontier.

Cons

4.159 Efficiency scores produced by DEA tend to be sensitive to the choice of input and output variables. Further, as the number of input and output variables increases, the number of efficient firms on the frontier also tends to increase.

[64] It is also possible to take into account returns to scale when using Stochastic Frontier Analysis (SFA), as it is possible to control for the scale of the operations.

4.160 Another disadvantage of DEA is that, unlike regression techniques, it does not provide a general relationship relating outputs and inputs. Also, DEA does not allow for stochastic factors and measurement errors. Recently developed DEA models (e.g. bootstrapped DEA) do have a statistical foundation and they are increasingly used to benchmark utilities; however, they are more complex to implement and perhaps less well understood than conventional non-statistical DEA models.

Applicability to Ofwat

Data issues

4.161 Although Ofwat has considered the use of DEA techniques for benchmarking purposes in the past, it does not currently employ such techniques. However, given the data that Ofwat collects on various outputs and the data collected on cost inputs, it would be possible for Ofwat to implement DEA. In particular, DEA could act as an alternative to the regression techniques used to assess operating expenditure efficiency, or as a cross-check of the results obtained from the regression analysis.

4.162 DEA could potentially be a useful tool to assess the scope for efficiency improvements in operating expenditure because DEA is, in general, less reliant on large sample sizes; however, DEA is also sensitive to the existence of very few comparators, especially if there are significant differences between the comparators. Significant effort may be required in order to clean the data and determine the appropriate inputs and outputs, but it is not clear that this would necessarily be more burdensome than the processes required to make data comparable for use in the regression analysis that is currently done.

Potential value of comparisons

4.163 DEA is potentially a useful benchmarking tool as it would not require Ofwat to specify a functional form for the model, as is currently required with the Corrected Ordinary Least Squares (COLS) approach, although it would not remove the issues around selecting appropriate inputs/outputs. In addition, it would allow Ofwat to account easily for returns to scale in the benchmarking process. It can also be argued that DEA is less reliant on a rich sample size given that it is a non-parametric technique; however, it has been shown that DEA is also sensitive to the existence of very few comparators, especially if there are significant differences between the comparators.

4.164 In addition to assessing the efficiency scores of firms in the water sector, if panel data are available DEA can also be used to build estimates of average technical change in the industry to inform regulatory assumptions on frontier shift.

4.165 DEA would also be a useful approach for determining best practice in the industry because the efficiency frontier is based on the most efficient firms in the sample. However, as more inputs and outputs are included in the analysis, more firms will tend to move to the frontier – making efficiency comparisons difficult. This may be a particular problem in the current vertically integrated structure of the industry, given the variety of inputs and outputs that are likely to be relevant at different stages of the value chain.

Impact of potential market reform

4.166 Comparative efficiency analysis for costs will potentially become less relevant for any parts of the value chain that are opened to competition, particularly if competition becomes sufficiently established such that price regulation can be removed.

4.167 However, comparative efficiency analysis may still be important during the transition to fully competitive markets, and DEA could have a role to play during this transitional period. In particular, if the government decides to ease merger restrictions for companies operating in potentially competitive parts of the value chain (e.g. retailing), then the number of comparators available for comparative efficiency analysis may decrease. In these circumstances, DEA analysis, which can potentially be done with fewer comparators, could be used in place of regression analysis when setting transitional price controls for incumbent companies in this part of the value chain. However, it should be noted that DEA is also sensitive to the existence of very few comparators, especially if the comparators are very different.[65]

4.168 Separate sub price controls for resources and network plus (or separate non-binding price controls within a "wholesale" price control) could allow Ofwat to employ DEA with different inputs and outputs to reflect the nature of different stages of the value chain. Such an approach could also be implemented under a global "wholesale" price control, but it may be more difficult to use the results to create differing incentives for efficiency improvements for different stages of the value chain. Under both options, care would still need to be taken in defining the relevant inputs and outputs to ensure that the efficiency frontier identifies the scope for improvement.

4.169 In principle, different industry structures might have an impact on the reliability of comparisons using DEA. If the potential market reforms lead to some companies choosing to vertically disintegrate, there may be an increase in the heterogeneity of firms, making the efficiency frontier more difficult to interpret.

4.170 DEA could potentially be used separately to assess the scope for efficiency improvements for the system operation functions carried out by the network plus business units. This might be a particularly useful approach because it may be difficult to specify a cost or production function for system operation given that this service has not been separately defined in the water sector before.

---

[65] It has been suggested that the minimum number of observations for DEA should be max[3*(n+m), m*n], where m is the number of outputs and n is the number of inputs. There are other more permissive rules of thumb; for example, the number of observations should be larger than 2*(n+m). See, for example: Cooper et al, 2007, Data envelopment analysis: a comprehensive text with models, applications and references.

Qualitative Review alongside Quantitative Comparisons

Description

4.171 The use of qualitative review when making comparisons is discussed earlier in this section. However, expert judgement can be applied more narrowly to the results of quantitative comparisons, such as cost efficiency analysis. In this case qualitative review by experts can be used to understand and apply the results of cost efficiency analysis, and this can be particularly relevant where the interpretation of the results is complex. Another example could be in the context of environmental performance, by comparing carbon emissions per litre of water alongside qualitative evidence as to why companies' performances against this measure differ from each other.

4.172 There are a number of quantitative comparisons that can be undertaken, such as top-down benchmarking using regression techniques; comparison of unit costs, prices or environmental indicators; or scrutiny of company plans. Where more than one technique has been applied to compare the efficiency of companies (or the same technique has been used with different data sets) qualitative review can be required to assess the different results and contribute to final decisions.

4.173 Qualitative review alongside quantitative comparisons may also be necessary, to account for other sources of information that could not be included in the original analysis and yet are still important in determining the level of efficiency across companies. This would include firm-specific factors or data that could not be used due to comparability or robustness issues.

4.174 Gap analysis is an example of qualitative review alongside cost-efficiency results, whereby experts make an assessment of the degree to which a firm falls behind the level of the efficiency benchmark. This can then feed into decisions about the appropriate level of cost reduction required of the firm and the appropriate mechanism for ensuring this.

4.175 Although qualitative review of qualitative comparisons does involve a higher degree of discretion than more mechanistic approaches and can be criticised for being too subjective, the fact that it is based on the results of quantitative analysis provides an objective starting point.

Practical examples

ORR: International cost efficiency benchmarking of Network Rail[66]

4.176 Regression analysis is used by the ORR to assess the scope for Network Rail to improve its cost efficiency. The results are used to establish levels of access charges at a periodic review of Network Rail's outputs.

4.177 Network Rail is a single national monopoly and thus the use of international benchmarking is necessary. This makes the benchmarking work more difficult, in particular to ensure that the comparisons are conducted on a like-for-like basis. The ORR uses the International Union of Railways' (UIC) "lasting infrastructure cost benchmarking" (LICB) dataset as input to the econometric analysis undertaken. This dataset comprises maintenance and renewals expenditure and other data for a total of 14 European rail infrastructure managers (of which 12 were used), including Network Rail, for the period from 1996 to 2008.

4.178 The preferred model is based on total maintenance and renewal cost. This takes account of the trade-offs between maintenance and renewals, and any accounting differences between countries in the way in which maintenance and renewal costs are recorded.

4.179 In PR08, the ORR recognised that the available data for the econometric analysis did not enable detailed explanation of all of the difference between Network Rail's cost base and that of its peers. Considerable effort was undertaken to understand from a qualitative and quantitative perspective the factors driving the results, which include technologies and working methods, network/infrastructure configuration, wage rate differentials, differences in geography, macroeconomic factors and differences in government policy.

4.180 In terms of qualitative review, the ORR commissioned expert consultants to review the harmonisation assumptions the UIC uses to account for country differences in its LICB dataset, and to undertake international visits to better understand engineering and asset management practice of other railways. The results of this work (as well as quantitative modelling work) confirmed that the results of ORR's international econometric benchmarking work were robust.

Analysis of approach

Pros

4.181 An advantage of undertaking qualitative review alongside quantitative results, is that important information which could not be included in the quantitative analysis can still be taken into consideration. This includes accounting for firm-specific information, or adjusting for weaknesses in the data. Using quantitative results mechanistically can at times be too broad-brush.

4.182 Qualitative judgement may be needed where different quantitative comparisons are used in the same area - for example, when comparing companies' performance against different environmental indicators to measure overall environmental performance. It may not be appropriate to emphasise one set of comparators over another, but instead to take all the information together to form an overall judgement. It will not necessarily be

---

[66] ORR: International cost efficiency benchmarking of Network Rail, 2010

possible to aggregate results into one measure, and so the qualitative judgement of experts will be required.

4.183 Qualitative review of efficiency results can be used to examine areas in which companies fall short of benchmarks, in order to determine whether this gap in measured performance is the result of differences in efficiency or is due to structural factors that need to be accounted for separately. Qualitative review can also identify opportunities for improving efficiency.

4.184 Qualitative review can also be used to test and select the appropriate quantitative technique or model to use, and to refine the model by identifying any shortcomings of the results.

Cons

4.185 Where qualitative review of efficiency results by experts is heavily used to make final decisions, this may leave the regulator open to disagreements with stakeholders on the grounds of the subjectivity of the conclusions drawn.

Applicability to Ofwat

Data issues

4.186 Whilst the qualitative review of quantitative comparisons does not involve the use of data, information to support the qualitative review will still need to be collected. Ofwat already collects a significant amount of information from companies through the June Returns and business plans at price reviews. This information also includes special factor claims submitted by companies. Depending on the area subject to qualitative review, additional information may need to be provided by companies.

Potential value of comparisons

4.187 Using qualitative review in conjunction with quantitative results will enable the results from different work streams (either different areas, or different techniques) to be drawn together and an overall decision made about (for example) what cost allowances environmental performance targets should be set. In addition, judgements as how to factor in firm-specific factors - or how to treat data issues - will ensure that final decisions are based on a wider range of information and not just that which is feasible to include into quantitative analysis.

Impact of potential market reform

4.188 As long as quantitative comparisons are used by Ofwat, qualitative review of these results would continue to have benefits.

4.189 If potential market reform leads to an increase in competition in the contestable parts of the value chain and it is possible for Ofwat to employ lighter-touch regulation, e.g. in the

non-household retail sector and the sludge treatment and disposal sectors, then it may be that regulatory assessment of efficient costs could be replaced with lighter-touch regulation (such as monitoring prices). The use of qualitative review alongside cost efficiency results may therefore no longer be as relevant. On the other hand, Ofwat may still undertake efficiency analysis and require some qualitative review in order to interpret and apply the results in a more transitional or lighter-touch regulatory framework.

4.190 If the regulation of the system operation functions in the network plus business entails the use of quantitative comparisons, then qualitative review of the results may be particularly useful whether the comparisons are made separately for the system operation functions or for the network businesses as a whole. The lack of historical data, or possible unfamiliarity of the issues relating to system operation, may increase Ofwat's reliance on additional qualitative information to reach decisions or inform policy development.

Requirement on Companies to Provide Comparable Information to Customers

Description

4.191 The use of comparators by regulators often involves a requirement on regulated companies to provide the regulator with information.[67] However, it may also be useful to require regulated companies to provide information directly to customers in a format that enables the customer to make comparisons across companies. In the absence of competition, this would be for information purposes only. However, once customers have been given the right to switch supplier, such information provision could potentially support customers in choosing between suppliers, thus helping to underpin effective retail competition.

4.192 The type of information provided could be wide-ranging. It could relate to the way tariffs and charges are structured (e.g. having the same unit of measurement across companies); or to performance indicators such as environmental efficiency or quality of service. Regulators often compile reports which include comparisons across companies,[68] and some of this information could be provided directly to customers by companies themselves rather than by the regulators.

4.193 The format in which the information is provided to customers could vary depending on what information is being provided. For example, information that is presented consistently by all companies could be provided to customers in their bills; or in the form of annual statements, or newsletters and booklets.

---

[67] Information can of course also be obtained through other sources.
[68] Such as Ofwat's Service and Delivery report

Practical examples

Ofgem: Information Provision under Standard Licence Conditions

4.194 The Standard Licence Conditions in the gas and electricity supply licence issued by Ofgem include a number of requirements for information that gas and electricity suppliers must include in bills and annual statements.[69] For gas and electricity bills this includes (among other things):

(a) comparison of consumption for the period covered by the bill with consumption for the corresponding period in the previous year;

(b) consumption for the previous 12 months;

(c) projected costs, in £'s, for the forthcoming 12 months, and setting out the charges used;

(d) information about the amount of gas supplied, including the basis for the calculation and any details of "adjustments made in relation to a temperature and pressure conversion factor";

(e) fuel mix disclosure — fuel sources used for generation and their environmental impact.

4.195 For electricity Annual Statements, the required information includes (among other things):

(a) consumption for the previous 12 months;

(b) projected costs, in £'s, for the forthcoming 12 months;

(c) tariff premiums or discounts compared to the standard direct debit tariff;

(d) principal terms and conditions of contract;

(e) a reminder of customers' right to switch "in a prominent position";

(f) where to seek impartial advice about changing supplier.

4.196 The requirements stipulate that the information provided to customers be standardised and comparable. For example, the requirement to disclose information about the fuel mix states that suppliers must disclose the fuel sources from which the electricity that it supplies has been generated, specifying the percentage of fuel mix for each fuel source.

---

[69] Ofgem 'Standard conditions of electricity supply licence 2010' http://epr.ofgem.gov.uk/document_fetch.php?documentid=15254

Suppliers must also disclose the environmental impact of the electricity in terms of grams of carbon dioxide emitted and radioactive waste produced per kWh.

4.197 The aim of the information requirements in bills and annual statements is to equip customers better to compare the charges and service quality of their supplier with other suppliers, and to facilitate switching where appropriate.

Analysis of approach

Pros

4.198 An advantage of requiring companies to provide comparable information to customers is that this enables customers to compare aspects such as cost and service quality across a number of providers. This in turn enables them to make more informed decisions about whether to switch providers, where this is possible, or to exert pressure on the company in areas where it is not performing as well as its competitors.

4.199 There is some evidence that the "sunshine regulatory model" - where the outcome of a benchmarking exercise is made publicly available so as to shame the least-performing entities and to acclaim the best-performing entities – leads to efficiency gains.[70]

4.200 Requiring companies to provide comparable information to customers could be particularly useful where a degree of competition already exists in the market, and where regulation is relatively light-touch. Having well-informed customers could further promote competition, and act as a check on any incentives that companies might otherwise have to charge higher costs or provide poor quality service.

4.201 This tool would also not involve significant levels of costs or resources for the regulator.

Cons

4.202 Requiring companies to provide customers with comparable information could impose significant costs on companies, particularly if specific research and/or publishing were required. Where such information is already provided (or at least collected) by regulators, (such as environmental performance published in annual reports which can be accessed by consumers), then these additional costs may be difficult to justify.

4.203 The benefit of this approach would also depend on the extent to which stakeholders took notice of the information and/or acted on it. The extent to which reputational incentives will affect firms' behaviour will depend upon the pressure exerted by customers, the media and city analysts, which may be less powerful in non-competitive industries.

[70] https://lirias.kuleuven.be/bitstream/123456789/200140/1/DPS0828.pdf

4.204 The comparability of the information provided to customers depends on companies following a common methodology in measuring and reporting the data. While the regulator can specify the methodology that companies must follow in order to address this issue, it may not be possible or desirable to specify every detail of how calculations should be performed. Further, some element of monitoring (and if necessary, enforcement action) by the regulator may be necessary to ensure companies comply with the specified methodology.

4.205 Finally, there may be cases in which there are legitimate reasons for differences between companies (e.g. optimal leakage levels may differ between water companies), and if customers do not understand these reasons then the provision of comparative information may distort their perceptions of how well different companies are performing.

Applicability to Ofwat

Data issues

4.206 Ofwat currently collects large volumes of data for the purpose of comparisons between the water companies, some of which could be made available to customers by the companies themselves to provide information on a basis that is consistent throughout the industry.

Potential value of comparisons

4.207 Providing comparable information to customers can provide reputational incentives for firms even in non-competitive industries via the pressure exerted by customers and other stakeholders – although the incentive may not be as strong as in a competitive-market structure. For those customers able to switch water or sewerage supplier, the ability to compare key pieces of information across companies could improve their ability to make such decisions, which in turn could increase competitive pressures upon companies. At present, only non-household customers being supplied over 50 Ml of water a year in England or 250 Ml a year in Wales are able to switch suppliers or make use of a new appointment under water-supply licensing. This is the statutory threshold requirement. In 2009, the Department of Environment, Food and Rural Affairs (Defra) commissioned a study into competition and innovation in water markets (the Cave Review)[71] which recommended that this threshold be reduced to five Ml per year as soon as practicable, and that there may be further benefits of abolishing the threshold on accompanying changes to the retail framework. Whilst the threshold still remains at this time it is possible that it will fall in the future, thus increasing the number of customers able to switch suppliers and the potential value of comparative information.

[71] Cave (2009) 'Independent Review of Competition and Innovation in Water Markets: Final report' http://www.defra.gov.uk/environment/quality/water/industry/cavereview/documents/cavereview-finalreport.pdf

Impact of potential market reform

4.208 Potential market reform may lead to increasing entry in contestable segments of the supply chain, so it may be that customers are able to switch providers and thus access to comparable information would have greater benefits. The Cave Review, commissioned by the UK Government, indicated that household customers will not be able to switch providers so the increase in switching is likely to be limited to non-household customers. This could be potentially valuable with default tariffs in place, because it could help customers assess the extent to which different suppliers are offering terms and conditions that are better than the default. However, the value of customer pressure in influencing firms' behaviour may only be significant if competition develops to a significant degree.

5 WHAT ARE RESULTS USED FOR?

5.1 The results of comparisons may be used in a variety of ways by the regulator; for example, results may be used to implement schemes that act as a substitute for competition (e.g. comparative efficiency analysis for network regulation) or to support competition (e.g. information league tables provided to customers).

5.2 The way in which the results are used will depend on the objective that the regulator is trying to achieve. The use of the results of comparisons may also depend on the variables that are being compared and the way in which the comparison has been made.

5.3 In this section we consider the following uses of the results of comparisons:

(a) to monitor prices;

(b) to monitor behaviour;

(c) to monitor other outcomes;

(d) to provide information;

(e) to set prices directly;

(f) to set cost allowances;

(g) to underpin mechanistic performance incentive schemes;

(h) to underpin discretionary performance award schemes;

(i) to allocate funding;

(j) to inform policy development; and

(k) to identify best practice for companies.

To Monitor Prices

Description

5.4 Monitoring of prices is frequently undertaken by regulators where markets are liberalised to some degree and in which some competition exists. In these cases the regulator often does not set all prices, and through monitoring the market the regulator is able to ensure that the market is operating efficiently and that there is no market abuse. Regulators can also make use of comparisons to monitor prices where the incumbent makes price proposals in order to draw inferences as to whether these are excessive or predatory.

5.5 Where price controls are used, regulators might use comparisons to monitor the structure of charges. If price limits are defined in terms of average revenue or for a basket of tariffs,

then so long as the firm keeps within the limits across its charges as a whole, it has some flexibility about the structure of its charges (i.e. how charges are structured between different customer groups, between fixed and variable tariff elements etc.). In this case, the regulator might use comparisons to assist in checking that the structure of charges was appropriate.

5.6 Where at least some segments of the market are competitive, the regulator could monitor prices using domestic comparators. International comparators can sometimes be used where this is infeasible.

5.7 In some markets, it may be necessary for the regulator to monitor prices on a continual basis in order to ensure that the market is functioning efficiently, whereas in other cases, periodic reviews will be all that is necessary. In some cases, investigation of prices will occur at the recommendation of another market participant, consumer or other stakeholder.

5.8 An important issue with using comparisons to monitor prices is that of data comparability. Monitoring of prices can pose significant data comparability issues, since there will be numerous factors which can affect the prices that firms charge, making inferences regarding excessive or predatory pricing difficult. Despite this, regulators can use comparisons to monitor prices as a broad check on the level of prices relative to others, which can act as a warning signal that further, more robust investigation into the functioning of the market may need to be undertaken.

5.9 Comparisons to monitor prices are generally conducted using simple metrics such as charts and tables, although qualitative review by experts is often also necessary to order to take account of the data issues discussed above.

Practical examples

Ofcom: Monitoring BT's leased line charges

5.10 In order to monitor BT's prices and assess if they are excessive, Ofcom uses international benchmarking. Ofcom compares the level of UK prices with the prices of leased lines for countries in the EC and beyond.

5.11 Ofcom notes that BT's prices could in principle be compared to its competitors, but data limitations make this approach unfeasible. Ofcom would need to know the prices that BT and its competitors charge in the retail market, but the only prices that are readily accessible are BT's published prices. Other Communications Providers (OCPs) tend to use bespoke pricing, making it difficult for Ofcom to form a view on a representative set of OCP prices.

5.12 Ofcom uses data from a report from the European Commission to compare the prices of leased lines of different lengths and different bandwidths offered by incumbents in Europe, North America and Japan. The prices are compared using simple charts of price along the y-axis against countries along the x-axis, along with a EU24 average price line.

Prices are assessed on a market exchange rate basis. The charts allow for general comments about BT's relative positioning compared to companies in the other countries.

5.13 Ofcom also uses an OECD study to compare leased-line prices in the UK against those of other OECD members as a cross-check on the conclusions drawn from the European Commission study.

5.14 Making use of data from previous studies means Ofcom has no data issues to contend with, in terms of either finding or cleaning the data. However, the short-coming of this is that Ofcom is not able to manipulate the data. For instance, in making these international comparisons, there are many factors which it may be useful to adjust for in order to make the comparisons more robust. Ofcom acknowledges that factors affecting prices may include:

- intensity of competition in a market;
- factors affecting the retail cost base, such as the level of competition in upstream markets;
- the level at which regulated wholesale charges are set;
- the prices of other inputs;
- the particular tax treatments of the entity supplying the service;
- entities' differing approaches to cost recovery;
- the services whose prices are being compared are not identical; and
- the fact that some incumbents may price their circuits differently with varying, often unpublished, discount structures.

ACCC: International benchmarks of Unconditioned Local Loop Service Band 2 charges

5.15 The ACCC carried out international comparisons on access prices for the unconditioned local loop service (ULLS) when considering whether Telstra's (the incumbent's) proposed monthly access charge for "Band 2" (which relates to metropolitan areas) was excessive.

5.16 The ACCC considered charges in 14 other countries. The ACCC compared raw charges and charges adjusted for purchasing power parity (PPP). The incumbent's proposed charge was compared to each of the comparators and compared to the average of this group. The draft decision also considered, at a high level, the effect of the density of the population, in the sense of identifying the direction in which this should affect the charges (on the basis that charges would be expected to be lower in a more dense area).

5.17 From this comparison, the ACCC concluded that there was a "significant discrepancy" between the Proposed Monthly Charge and international benchmarks.[72]

5.18 The ACCC received comments arguing that the above approach was insufficient to draw valid conclusions. In its final decision, the ACCC commissioned an external consultancy (Ovum) to consider six adjustment factors: general regulatory framework, population density, land use, copper prices, loop length, and pricing structure.

5.19 Each of these adjustments was considered separately. For all of the adjustment factors, Ovum undertook broad comparisons by creating tables and charting the data with a line of best fit (for example, a chart of charges versus population per square kilometre). Conclusions were then drawn based on the position of Telstra on the chart.

5.20 Ovum makes the general comment that data are not readily available for comparative purposes. For example, they were unable to investigate land use due to reliable data being unavailable.

Analysis of approach

Pros

5.21 Where it is possible to use comparisons to monitor prices in a market, the principal advantage is that it can allow the regulator to ensure that the market is functioning efficiently and that there is no abuse by the incumbent of its dominant position.

5.22 Such comparisons can allow a sense check on the prices charged and can alert the regulator to the need to undertake further investigations if there are significant discrepancies. Regulators may use the information gathered to instigate formal market investigations under the Competition Act, or to impose *ex post* sanctions on the firms. This could act as a strong deterrent to firms from charging excessive or predatory prices in the first instance.

5.23 Monitoring prices in the market can help to ensure that consumers' welfare is not being compromised. It can be seen as particularly important to ensure that vulnerable customers are not being charged excessively and are receiving a minimum level of service, and that the incumbent is not pricing in a predatory manner to drive new entrants out of the market.

5.24 In a contestable market where some degree of competition exists, informing consumers about prices can help to promote competition in the market, by reducing the cost to consumers of gathering this information. Where switching costs are not insurmountably high, the possibility of consumer switching can incentivise firms to price competitively.

---

[72] ACCC draft decision on Telstra's ULLS Undertaking
http://www.accc.gov.au/content/index.phtml/itemId/848843

Cons

5.25 Using comparisons in order to monitor prices does present some difficulties in terms of data comparability. Monitoring prices alone may not give a sufficiently accurate picture of the functioning of the market. For instance, lower prices may be associated with an unacceptably low level of service to consumers.

5.26 Where there are few domestic comparators to use in the assessment, international comparators can be used, but there may be numerous factors which must be taken into account in order to ensure the comparability of the data. Such factors can include differences in price levels within countries, different approaches to the bundling of charges by firms, differences in demographic make-up of consumers, and geographical factors. Some of these factors can be accounted for when comparing prices (for example, comparing prices adjusted for purchasing power parity instead of, or as well as, comparing prices on a market exchange rate basis), whereas data availability may mean that taking full account of other factors quantitatively is not possible.

5.27 Even where domestic comparators are available, issues can remain in that published prices may not be reflective of the actual prices charged – for example, if discounts and bespoke packages are commonplace offerings by the firms to their customers. Further, comparison of prices may be difficult due to differences in tariff structures between firms. This can make it a difficult task for the regulator to compare prices in the market sufficiently accurately and robustly.

5.28 Where competition has only recently been fostered within a market, additional factors may need to be taken into account. One instance of this could be if competitors are pricing lower than the incumbent in order to enter the market. In this case it cannot necessarily be inferred that the incumbent has market power, and caution may be needed in drawing conclusions from such comparisons.

5.29 Further, price comparisons within a market may not pick up all instances of anti-competitive behaviour. For instance, if a cartel were in operation then prices might be higher for all firms, and hence the existence of anti-competitive pricing in the market would not be picked up by comparing prices between firms. Similarly, if an incumbent with a dominant position were to engage in excessive pricing, then prices for new entrants might also be higher due to price leadership effects, in which case comparisons would again not pick up the existence of pricing problems in the market.

5.30 Some caution may be necessary when presenting the results of price comparisons to consumers. As an example, although informing consumers can promote competition within the industry, it may be misleading to consumers without further information regarding additional factors which could legitimately contribute to the prices paid by some consumers being higher than that paid by others. Further, the provision of price comparisons by the regulator may displace market provision of such information to consumers (e.g. by consumer organisations). In addition, if there is a cartel operating in

the market, then provision of price comparisons could aid the cartel in synchronizing prices.

Applicability to Ofwat

Data issues

5.31 Given the regional nature of the water and sewerage industry in England and Wales, there may be several factors that have an effect on the prices charged by different companies. It may be difficult to take these factors into account when comparing prices across different firms within the sector, thus making it difficult to draw conclusions from the monitoring of prices.

5.32 Similarly, if Ofwat were to make international comparisons of prices in order to monitor prices charged by water and sewerage companies in England and Wales *vis-à-vis* prices in other international markets, there are potentially significant data issues associated with making the comparisons and drawing valid conclusions. International comparisons may well require a large amount of additional data to be collected in order to take account of other factors at play. This may be time consuming, since there may be data availability issues and there could also be data compatibility issues with this additional explanatory data. However, without taking a broad view on the factors affecting prices, drawing any valid inferences from comparisons may not be possible.

Potential value of comparisons

5.33 Despite the data issues, making comparisons to monitor prices could allow Ofwat to carry out sense checks on the prices charged by water companies. It may be possible to carry out domestic comparisons in contestable parts of the value chain, or international comparisons could be made if suitable comparators are available.

5.34 Under the current regulatory framework, if the results of the comparisons were published by Ofwat, monitoring of prices could also help to encourage competition in the contestable part of the retail market by providing customers with information that may encourage them to switch to alternative cheaper suppliers. However, Ofwat would need to be aware that this might displace the provision of such pricing comparisons by the market.

Impact of potential market reform

5.35 The value of price comparisons and the weight that Ofwat will be able to place on them will depend upon whether comparators are available and to what degree idiosyncratic factors can be taken into account.

5.36 If potential market reform leads to the development of effective competition in contestable parts of the value chain (such as in the non-household retail segment, and in sludge treatment and disposal) then Ofwat might in due course be able to adopt a lighter-touch approach to regulation of these activities. This could involve the removal of formal price controls, with Ofwat monitoring the market instead.

5.37 Price comparisons across firms operating within the market could be used as part of such a monitoring exercise. However, due to the shortcomings of price comparisons discussed earlier, they are unlikely to be enough on their own. Hence, in addition to monitoring prices Ofwat would probably also wish to keep track of other market outcomes, and to carry out more detailed periodic analyses of the state of competition in the market.

5.38 Where such monitoring identified a problem with the market, Ofwat could carry out a more detailed investigation and take further regulatory action as appropriate. Such regulatory action might involve:

(a) adjusting the market rules, in the case of an overall problem with market functioning; and/or

(b) launching enforcement action (e.g. using consumer protection or Competition Act powers), in the case of any instances of anti-competitive conduct by specific firms.

5.39 Cross-country price comparisons are likely to be less useful for monitoring purposes, given the factors which may differ between countries. However, such comparisons could perhaps be used to help assess the overall impact of potential market reform relative to other countries where such policy changes have not been implemented.

To Monitor Behaviour

Description

5.40 Regulators may use comparators to monitor the behaviour of firms in the regulated industry with a view to ensuring the efficient functioning of the market. This could be part of tracking firms' progress towards targets set by the regulator, or as part of light-touch regulation to ensure that minimum standards are maintained in respect of a certain critical aspect of performance.

5.41 Using comparisons in order to monitor the behaviour of firms can allow the regulator to ensure that its price controls and incentive schemes are having the desired effect. The interactions of different incentive schemes may have perverse behavioural effects on firms, which make comparisons of firms in monitoring behaviour important in order to minimise any negative outcomes.

5.42 Incentives placed on firms by the regulator to achieve cost-efficiency savings may lead firms to achieve these savings at the expense of other aspects of performance, such as quality of service. Using comparators to monitor firm behaviour in such areas as quality of service or environmental performance allows the regulator to ensure that minimum standards are maintained. Comparisons over time of a certain outcome across companies can allow the regulator to identify whether particular firms are consistently underperforming.

5.43 The regulator may wish to monitor competition within the market, to ensure the market is operating efficiently and that there is no anti-competitive or abusive behaviour. The

regulator may monitor innovative developments in the sector, be it the introduction of new technologies or new business practices. The information gathered can help the regulator to identify certain aspects of performance to be addressed specifically in the next price review; for example, with the introduction of specific incentive schemes.

5.44 Firms' behaviour may be monitored on a periodic basis as part of the on-going oversight of the industry by the regulator. In addition, specific studies into the firm behaviour may be carried out on an *ad hoc* basis, potentially because of concerns raised by customers or other stakeholders.

Practical examples

Ofwat: Overall Performance Assessment (OPA) and Service Incentive Mechanism (SIM)[73]

5.45 Ofwat previously used the Overall Performance Assessment (OPA) to compare the quality of the overall service the companies provide, although since April 2010 Ofwat has been using the Service Incentive Mechanism (SIM).

5.46 The OPA combined reputational and financial incentives to encourage firms to improve the level of quality of service they provide to customers. The OPA allowed Ofwat to compare the quality of the overall service the companies provided, and it also supplied consumers with information on how their local water company was performing when compared with others across a range of specific measures. A company that scored well on the OPA was allowed to charge its customers slightly more, while those that did not perform as well had to charge slightly less. The OPA used both comparative and absolute assessments of company performance against a range of measures.

5.47 Similarly to the OPA, the new SIM will be used to inform decisions on price limit adjustments and to provide customers with comparative information on company performance.

5.48 The SIM comprises:

(a) a quantitative indicator that measures complaints and unwanted contacts; and

(b) a qualitative indicator that measures how satisfied customers are with the quality of the service they receive, based on a survey of consumers who have had direct contact with their water company.

5.49 Ofwat may publish league tables setting out information about performance against the new measures, allowing consumers and other stakeholders to identify those companies that offer the best and worst levels of service.

---

[73] Ofwat: Service and Delivery – performance of the water companies in England and Wales 2009-10 http://www.ofwat.gov.uk/regulating/reporting/rpt_los_2009-10.pdf

The Office of Energy Regulation (Energiekamer): Analysis of developments on the Dutch wholesale markets for gas and electricity[74]

5.50 One of the statutory duties of the Office of Energy Regulation of the Netherlands Competition Authority (NMa Energiekamer) is to monitor the wholesale markets for electricity and gas. The results of the yearly monitoring are used to investigate impediments to competition in the wholesale markets, and to formulate proposals for measures that the NMa or the Minister of Economic Affairs can take to improve the functioning of these markets.

5.51 The regulator compares observed developments with benchmarks of the ideal situation. Three main aspects considered are:

- access to and availability of infrastructure;
- degree of competition among players (among producers, buyers and traders);
- development of marketplaces.

5.52 Depending on data availability, the criteria applied are:

- development over time, both within the year itself and in comparison with the previous year;
- situation in other countries, in particular countries with which the Netherlands has cross-border connections, such as Germany, Belgium and the United Kingdom;
- deviation from critical values of specific key indicators, such as RSI,[75] mark-up and the degree of coverage of investments;
- generally accepted rules of thumb, such as the rule that a market is strongly concentrated if it has a Herfindahl-Hirschman Index (HHI) of more than 1,800.

5.53 The statutory basis of the monitoring gives the NMa the power to request the necessary data from the market parties. A survey of traders is also conducted and information sought from external sources.

---

[74] Netherlands Competition Authority – Office of Energy Regulation, Monitor Energy Markets 2007, Analysis of developments on the Dutch wholesale markets for gas and electricity
http://www.energiekamer.nl/images/Monitor_Energy_Markets_2007_tcm7-121050.pdf

[75] The RSI indicates the degree to which market parties are pivotal (indispensable, necessary). The more capacity is needed from a player in order to meet the market demand, given the capacity of the other producers, the greater this player's ability to influence market outcomes. With an RSI smaller than 1, the joint capacity of the other players is insufficient to meet market demand and the relevant market player is pivotal. The further below 1 the RSI value, the more capacity required from this player and the greater the degree of indispensability.

5.54 The report makes use of a large variety of data and as such there are challenges associated with this. The NMa Energiekamer performs tests on the data to assess their reliability and the data are excluded if they are considered insufficiently reliable. There are issues with data availability in several instances, which are sometimes overcome through the use of proxies. For example, physical hourly-production capacity of the gas fields was not available, so production capacity was defined as the peak production in the 2006-2007 period.

5.55 The data are analysed on the whole using simple metrics and qualitative review. Metrics such as charts, tables, rankings, averages, standard errors, confidence intervals and t-tests are used. The NMa Energiekamer also undertakes regression analysis with mark-up as the dependent variable; and scarcity, RSI and gas price as dependent variables.

5.56 In the conclusions to the report, the NMa Energiekamer identifies actions which are needed to improve the functioning of the gas market and the electricity market, respectively.

Analysis of approach

Pros

5.57 The principal reason for using comparators to monitor firms' behaviour is to help to ensure the efficient functioning of the market. The regulator can ensure that firms are meeting targets set by the regulator and that regulation is not causing perverse behaviour in the market. Monitoring firms' behaviour can be used to check that firms are not engaged in anti-competitive or abusive behaviour, and that consumers receive a minimum level of customer service. The information gathered can help the regulator to identify certain aspects of performance to be addressed specifically in the next price review.

5.58 Where the information gathered is published, this can provide firms with a reputational incentive to perform at the industry standard. This can encourage competition between firms and pressurise firms into improving their relative performance. The effectiveness of reputational incentives will, however, depend on the importance placed by firms on outperforming their peers.

5.59 Monitoring the behaviour of firms in the industry promotes transparency and can help in making informed policy decisions. The regulator can identify and disseminate best practice in the industry and promote this amongst firms.

Cons

5.60 Monitoring firm behaviour with the possibility of taking *ex post* action if adverse outcomes are identified may not be as effective as the use of *ex ante* regulation. The fear of regulatory intervention may act as a deterrent to poor performance; however, this may not be as strong as incentives provided through *ex ante* regulation. In addition, dealing with adverse outcomes *ex post* can sometimes be an inefficient solution, since the welfare loss will already have occurred. For example, in the period before regulatory intervention

takes effect, customers may experience poor service and be mis-sold products, competitors may be driven out of business, or irreversible environmental damage may be caused.

5.61 *Ex post* regulation also introduces regulatory uncertainty to the industry, which can deter investment and innovation within the industry since there will be greater uncertainty for firms regarding future regulatory developments.

5.62 Monitoring behaviour can allow the regulator to identify and promote best practice within the industry. However, if companies are simply made aware of best practice without being incentivised to adopt it, then this may not be sufficient to change entrenched practices.

Applicability to Ofwat

Data issues

5.63 The data requirements in order to monitor firm behaviour will depend on the specific aspects of firm behaviour which are monitored by Ofwat. Data for some comparisons may already be collected by Ofwat, whereas data for other comparisons (e.g. firm behaviour in contestable markets if market reforms are implemented) would require new data collection. This could potentially increase the burden of regulatory compliance for water and sewerage companies, and hence Ofwat would have to give consideration to what aspects of firms' behaviour would need to be monitored in addition to or instead of those areas in which data are already collected.

Potential value of comparisons

5.64 Monitoring the behaviour of firms allows the regulator to ensure the efficient functioning of the market; for example, through monitoring if firms are meeting targets and if there is any evidence of market abuse.

5.65 The information can provide the regulator with an overview of the industry performance and progress. It can help the regulator to identify certain aspects of performance to be specifically addressed in the next price review. However, although the fact that certain aspects of performance may be regulated in the future can be enough to incentivise firms to perform well, this may not be as strong as incentives provided through *ex ante* regulation.

5.66 Publishing information and "naming and shaming" poor performers can provide firms with a reputational incentive to perform at least to the industry standard. It can also help to encourage competition between firms and pressurise firms into improving their relative performance, especially where some competition exists in the market.

Impact of potential market reform

5.67 Monitoring behaviour may be especially important to Ofwat if there is market reform, since, given the unprecedented changes, it will be important to ensure that the market is performing efficiently. It may be important to monitor how any new incentive schemes are interacting. For example, if separate price controls are being used for the resources and network parts of the value chain, it may be necessary to monitor behaviour to ensure that this does not lead to perverse outcomes.

5.68 Monitoring behaviour could also be important with regard to abstraction. Abstraction charges currently do not closely reflect the relative impact that resource use has at different times and at different locations. This may create the potential for resource cost incentives to distort the use of water resources in the absence of improved abstraction cost signals. Monitoring firms' behaviour may enable the Environment Agency and Ofwat to identify whether such perverse resource use outcomes are occurring.

5.69 Where potential market reform leads to increased entry into the contestable segments of the value chain, and sufficient competition is established, less *ex ante* regulation may be appropriate. In this case, monitoring the behaviour of firms could be a way for Ofwat to combine a lighter-touch approach to regulation while ensuring that the market is performing efficiently.

5.70 With increased competition, reputational incentives are likely to provide stronger incentives to firms' behaviour as firms seek to outperform their peers at winning customers and increasing revenues. Publishing the information gathered through monitoring firms' behaviour can therefore help to increase competition between firms and exert pressure on poor performers.

To Monitor Other Outcomes

5.71 In addition to monitoring prices and the behaviour of firms (discussed in the previous two sub-sections), regulators can also make use of comparisons to monitor firms' performance in a range of other areas. For example, regulators may make comparisons of firms' environmental performance or quality of service. The outcomes which are compared are likely to depend on the specificities of the regulated industry.

5.72 The results of the comparisons could be used for a variety of reasons. Monitoring may be necessary to track firms' progress towards achieving certain objectives set by the regulator, and to ensure that minimum standards are maintained in respect of a certain critical aspect of performance. Comparisons over time of a certain outcome across companies can allow the regulator to identify whether particular firms are consistently underperforming.

5.73 The regulator may wish to monitor innovative developments in the sector, be it the introduction of new technologies or new business practices. This could be with a view to ensuring that appropriate assumptions about best practice are made when setting price

limits and/or to ensure that the regulatory framework does not inhibit the testing and dissemination of such innovation.

5.74 These outcomes may be monitored on a periodic basis as part of the on-going oversight of the industry by the regulator. In addition, specific studies into the firms' behaviour may be carried out on an ad hoc basis, potentially because of concerns raised by customers or other stakeholders.

Description

Practical examples

Ofwat: Annual leakage performance and water efficiency[76]

5.75 The water companies calculate their sustainable economic levels of leakage (SELLs) and propose a leakage target. If Ofwat agrees then the SELL becomes the leakage target. Ofwat assesses the consistency of companies' annual leakage reporting with respect to annual leakage performance, in order to ensure that the way in which companies report leakage performance is consistent with how they derive their SELLs. By comparing leakage reporting between companies and over time, Ofwat assesses how reliable certain components of the water balance are, and also whether companies are using appropriate assumptions in defining and measuring their leakage targets.

5.76 Ofwat also uses comparators for other aspects of security of supply, such as comparing neighbouring companies' per capita consumption to verify that other components in the company's water balance are realistic.

5.77 Ofwat does not routinely compare leakage performance (either between companies or internationally), but does monitor SELLs to ensure that each company's leakage performance is efficient in the context of its own specific economic conditions. For some areas Ofwat uses data from other sectors for example, in its cost-benefit models of metering, Ofwat has used information from the energy sector on the financial and carbon costs of saving hot water.

5.78 Companies provide data relating to water efficiency (yield, costs and consumer engagement) for collation and analysis in the Waterwise Evidence. Evidence Base reports are published on the Waterwise website. This evidence base will help inform Ofwat's assumptions about water savings which are used in water efficiency targets. The main aim of the evidence base, however, is to provide a better understanding of the cost and effectiveness of water efficiency interventions to help water companies choose the optimal approach to balancing supply and demand.

---

[76] Ofwat 'Water demand and supply policy' as part of PR09 Phase Two, November 2008. http://www.ofwat.gov.uk/pricereview/pr09phase2/pap_pos_pr09supdempol.pdf

5.79 The comparators are used either to make qualitative comparisons or to compare simple metrics (e.g. unit costs). A minimal amount of data cleaning is required, and Ofwat does very little in the way of adjusting or normalising the data.

5.80 Ofwat currently makes use of Reporters[77] to check companies' figures and estimates to highlight any anomalies. This enables Ofwat to assess how reliable the data are and thus identify the extent to which Ofwat can be confident in using them.

5.81 The use of comparators in this area has allowed Ofwat to improve its judgement on companies' claims and enabled Ofwat to take an overarching view on companies' costs. It has also informed Ofwat policy. In particular, the use of comparators (predominantly within-company comparators over time) has enabled Ofwat to monitor effectively companies' leakage performance against targets.

5.82 Some of the data used by Ofwat in its comparisons are provided through evidence from company commentaries,[78] although these data must be corroborated by official sources for Ofwat to be able to use them in regulatory decisions. The loss of these commentaries will thus have some impact on the use of the data, although Ofwat is unlikely to be solely reliant on company commentaries as a source of information.

National Water Commission, Australia: National Performance Report[79]

5.83 A key commitment in Australia's National Water Initiative is annually to benchmark water pricing and service quality of urban and rural water service providers in separate reports, independently and publicly. Urban and rural water service providers are considered separately due to the differences in the nature of urban and rural water industries. Different performance-reporting models apply to urban and rural water delivery agencies.

5.84 The report is the national source of information on the performance of rural water service providers, and is intended to provide information for government agencies, rural water service providers, customers and community stakeholders.

5.85 The annual performance report for urban water companies contains data from 73 utilities from every State and Territory in Australia, on 117 performance indicators. The report presents comparative tables and charts with accompanying commentary and analysis.

5.86 The data are grouped under the following headings:

(a) Water resources:

---

77 Ofwat requires each water company in England and Wales to appoint an independent professional (Reporter) to examine, test and give an opinion on the regulatory information provided by the company to Ofwat.

78 This is being reviewed by Ofwat as part of its review of regulatory compliance

79 NWC, National Performance Report 2008-09 - urban water service providers http://www.nwc.gov.au/www/html/2765-national-performance-report-2008-09---urban-water-utilities.asp?intSiteID=1

- The volumes of water abstracted to supply the firm's customers in the reporting period. It may also provide an indication of the diversity of supply sources, potential environmental issues, water treatment issues and a partial explanation for the relative operating and total cost of water of the utility compared to other utilities.
- The volumes of water supplied.
- Volume of sewage collected by the utility.
- Volume of recycled water supplied.

(b) Asset data:

- Number of water treatment plants providing full treatment. This indicator can also provide a partial explanation of a utility's relative operating cost and total cost. For example, a utility providing full treatment for most of its supply would have a significantly higher cost structure than one providing lesser treatment (e.g. disinfection only).
- Length of water mains and other properties. This provides an indication of the ease or difficulty of delivery of water to customers and is used as a normaliser for a number of other indicators. It is independent of source assets so as to facilitate comparison of water schemes.
- Sewerage assets.
- Recycled water treatment plants. This indicator can provide a partial explanation of relative operating and total costs.
- Water main breaks, water mains loss, and sewerage breaks.[80]

(c) Customers:

- Connected properties and population.
- Quality of service indicators.

(d) Environment;

- Number of treatment plants, sewerage treatment levels and compliance.

NWC, National Performance Report, 2008-09 - rural water service providers http://www.nwc.gov.au/www/html/2767-national-performance-report-2008-09---rural-water-service-providers.asp?intSiteID=1

[80] "Water mains breaks" refers to main breaks, bursts and leaks. "Water mains loss" refers to leakage and overflows from mains, service reservoirs and service connections. "Sewerage breaks" refers to a failure of the sewer which results in an interruption to the sewerage service.

- Greenhouse gas emissions.

(e) Pricing and finance.

5.87 Ensuring the integrity of data in the National Performance Report is considered to be an essential element of the benchmarking process by the NWC. To ensure that stringent data quality procedures and processes can be met, data contained in the report are "locked down" in November of each year. In the event that data are subsequently found to be erroneous, the incorrect data are denoted with an asterisk, and the correct figures are supplied in an erratum section of the report.

5.88 The annual performance report for rural water companies publishes comprehensive data for 12 rural water service providers across Australia. The threshold for including a rural water service provider is that the additional recurrent costs incurred by that organisation in relation to data collection, reporting and required audits are less than 1 per cent of the total revenue associated with the provision of rural water services. Where the recurrent costs of reporting exceed this threshold, rural water service providers are not required to report; however, they are encouraged to do so in the interests of industry transparency.

5.89 Unlike the urban report which provides comparative tables as well as individual reports for each utility, the rural report only provides reports on individual company performance.

5.90 Data collected have been collated in four sets:

(a) detailed characteristics: for example the number of rural water services provided, asset types, customer information, area covered;

(b) Customer Service indicators (e.g. number of complaints);

(c) environmental indicators: greenhouse gas emissions, environmental management;

(d) financial indicators.

Ofcom: Comparing the service of internet service providers[81]

5.91 Ofcom began research in 2008 into the performance of UK fixed-line residential broadband connections, in respect of actual broadband speeds. Ofcom commissioned the independent research in this area since there was previously limited robust research available. The aim of the reports (which have been published in 2009 and 2010) is to be a reference source for consumers and other stakeholders, to ensure that consumers have the clearest possible information about broadband services. Ofcom expects to publish further reports at approximately six-monthly intervals. In line with the aim of the reports,

[81] UK broadband speeds, May 2010: The performance of fixed-line broadband delivered to UK residential consumers http://stakeholders.ofcom.org.uk/binaries/research/telecoms-research/bbspeeds2010/bbspeeds2010.pdf

key technical terms and statistical concepts are explained and data are presented using simple metrics.

5.92 The focus of the report is on average download speed and how this varies by a range of variables, including: geographical location, time of day, access technology and Internet Service Provider (ISP) package. The report presents the findings from the research which involved the collection and interpretation of over 18 million data points. Ofcom included comparative data for those ISP packages for which sample size was large enough to make the analysis statistically meaningful.

5.93 Ofcom used statistical techniques to adjust the results to ensure that they are representative of the UK broadband population as a whole. This included weighting the results according to the rural/urban split, geographic market definition and ISP. For the provider-specific comparisons, Ofcom normalised the data for Digital Subscriber Line (DSL) operators by distance from exchange; this was necessary in order to provide like-for-like comparisons of ISPs who have different customer profiles. The weightings applied were also validated by a market research company.

Analysis of approach

Pros

5.94 Using comparators to monitor aspects of firms' performance allows the regulator to track firms' performance and monitor whether incentive schemes are inadvertently having perverse effects on the efficient functioning of the market. This allows the regulator the opportunity to address any negative outcomes at the next price review.

5.95 Comparisons over time of a certain outcome across companies can allow the regulator to identify whether particular firms are consistently underperforming.

5.96 Regulators may use such monitoring to assess the need for further regulation, particularly if there has been an uptake of new technologies or new business practices in the industry. For the firms, knowing that they may be regulated in a certain area in the future, may provide an incentive to ensure good performance in that area.

5.97 Comparisons which are published can provide firms with a reputational incentive to perform at the industry standard, encouraging competition between firms and pressurising firms into improving their relative performance. The effectiveness of reputational incentives will, however, depend on the importance placed by firms on outperforming their peers; in non-contestable markets firms may place less emphasis on their relative position within the industry for aspects of performance not subject to financial incentives.

5.98 Monitoring other outcomes can be a means for the regulator to identify best practice in the industry and promote this amongst firms.

Cons

5.99 Monitoring other outcomes opens up the possibility of taking *ex post* action if adverse outcomes are identified. However, the deterrent effect of *ex post* action may not be as effective as the use of *ex ante* regulation and can sometimes lead to inefficient outcomes for society, since the negative outcome will already have occurred. For example, customers may experience poor service and be mis-sold products, or irreversible environmental damage may have been caused.

5.100 *Ex post* regulation also introduces regulatory uncertainty into the industry, which can deter investment and innovation within the industry since there will be greater uncertainty for firms regarding future regulatory developments.

5.101 Monitoring behaviour can allow the regulator to identify and promote best practice within the industry. However, simply making companies aware of best practice without incentivising them to adopt it may not be sufficient to change entrenched practices.

Applicability to Ofwat

Data issues

5.102 The intensity of the data requirements will depend on the specific outcomes which are monitored by Ofwat. Data for some comparisons will already be collected by Ofwat, whereas data for other comparisons might require new data collection.

Potential value of comparisons

5.103 Monitoring certain outcomes will allow the regulator to assess how well firms are performing and also (in contestable parts of the value chain) how well the market as a whole is functioning. Using comparators to monitor outcomes can allow the regulator to assess whether incentive schemes are inadvertently having perverse effects on the efficient functioning of the sector.

5.104 These types of comparisons may be particularly valuable where significant changes take place in the industry, be it regulatory change and potential market reform, or the uptake of new technologies or business practices. The full impacts of changes on any industry are hard to predict, so careful monitoring may be necessary to ensure that the market functions efficiently. These comparisons can also help the regulator to identify certain aspects of performance to be addressed specifically in the next price review.

5.105 Publishing information, and “naming and shaming” poor performers, can provide firms with a reputational incentive to perform at least at the industry standard, and can help to encourage competition between firms and pressurise them into improving their relative performance, especially where some competition exists in the market.

Impact of potential market reform

5.106 Monitoring certain other outcomes of firms' performance may be especially important to Ofwat if there is market reform. Since it is difficult to predict the impacts of the potential reforms on all aspects of firms' performance, it may be necessary to monitor certain key aspects of performance to identify whether any problems materialise. Such monitoring may allow Ofwat to minimise perverse outcomes (e.g. by adjusting the framework for any market reforms in light of problems experienced, or by launching investigations into the behaviour of individual firms and taking enforcement action where appropriate).

5.107 If there are separate sub price controls for the resources and network parts of the value chain this is unprecedented in the industry, and so it may be necessary to monitor certain outcomes in these two segments of the value chain.

5.108 Where potential market reform leads to increased entry to the contestable segments of the value chain, and sufficient competition is established, less ex ante regulation may be appropriate. Monitoring certain outcomes of firms' performance could be a way for Ofwat to combine a lighter-touch approach to regulation while ensuring that the market is performing efficiently.

5.109 Increased competition may lead to reputational incentives having a stronger effect on firms. If Ofwat were to publish the information gathered through monitoring particular outcomes of firms' performance, this could potentially help to increase competition between firms and exert pressure on poor performers.

To Provide Information

5.110 Information that is collected by the regulator can be published publicly to inform consumers, the government and other stakeholders, as well as the firms themselves. Publishing comparisons provides a snapshot of the market at that point in time which can be used by customers to inform their purchasing decisions (where they have the ability to choose their supplier) and to allow all stakeholders of the industry to develop an informed view.

5.111 There is often an information asymmetry between firms and their customers regarding the performance of firms in the industry, potentially because the cost of acquiring this information is too high for individual consumers. By providing information to consumers, the regulator is helping to reduce this asymmetry – although this information could also be provided by the market.

5.112 The indicators which are compared might typically relate to dimensions of performance that are objective, observable and verifiable, in order to minimise arguments over subjectivity. Dimensions which may be compared are quality of service, environmental performance, financial performance, security of supply and levels of innovation.

5.113 The data are usually presented using simple metrics, for clarity and ease of understanding. League tables may be used by regulators where there are several

regulated firms. League tables compare the performance of firms, potentially along several dimensions and potentially through the ranking of firms. They allow relative performance levels to be assessed and can be used by both firms and consumers.

5.114 Publicly providing information on firms can be used to ensure that other indicators of firms' performance do not get compromised as the regulated firms try to achieve efficiency savings.

5.115 Publishing comparative information about firms can provide strong incentives for the firms to improve performance. In this case, the information is provided to publicly identify good performers and to "name and shame" poor performers. In a competitive market, providing such information to customers allows them to make more informed purchasing decisions, and firms have a reputational incentive to perform along these dimensions to the extent that this information influences customer behaviour (e.g. by affecting their choice of supplier or word-of-mouth recommendations to other customers).. However, reputational incentives will only be successful if regulated firms place at least some importance on outperforming other companies, which may not be the case where the market is not contestable.

5.116 In circumstances in which the regulator focuses on "naming and shaming" poor performers, the publication of information with regard to performance may only provide firms with an incentive to ensure that they do not fall too far behind the industry standard, rather than providing firms with incentives to outperform their peers.

Description

Practical examples

Ofwat: Overall Performance Assessment (OPA) and Service Incentive Mechanism (SIM)[82]

5.117 Ofwat previously used the Overall Performance Assessment (OPA) to compare the quality of the overall service the companies provide, although since April 2010 Ofwat has been using the Service Incentive Mechanism (SIM).

5.118 The OPA combined reputational and financial incentives to encourage firms to improve the level of quality of service they provide to customers. The OPA allowed Ofwat to compare the quality of the overall service the companies provided, and it also supplied consumers with information on how their local water company was performing when compared with others across a range of specific measures. A company that scored well on the OPA was allowed to charge its customers slightly more, while those that did not perform as well had to charge slightly less. The OPA used both comparative and absolute assessments of company performance against a range of measures.

---

[82] Ofwat: Service and Delivery – performance of the water companies in England and Wales 2009-10 http://www.ofwat.gov.uk/regulating/reporting/rpt_los_2009-10.pdf

5.119 Similarly to the OPA, the new SIM will be used to inform decisions on price limit adjustments, and to provide customers with comparative information on company performance.

5.120 The SIM comprises:

(a) a quantitative indicator that measures complaints and unwanted contacts; and

(b) a qualitative indicator that measures how satisfied customers are with the quality of service they receive, based on a survey of consumers who have had direct contact with their water company.

5.121 Ofwat may publish league tables setting out information about performance against the new measures, allowing consumers and other stakeholders to identify those companies that offer the best and worst levels of service.

Australian Energy Regulator: Victorian Gas Distribution Business Comparative Performance[83]

5.122 The Australian Energy Regulator (AER) became the economic regulator for natural gas transmission and distribution pipelines in all states and territories in 2008. It continued the work of the previous regulator in producing an annual performance report which details the performance of the three gas distribution network service providers (DNSPs) in Victoria: Envestra, Multinet and SP AusNet. The report allows comparisons of financial performance, reliability of supply, network reliability and customer service.

5.123 The purpose of these comparisons is to encourage competition between gas DNSPs by providing an incentive for DNSPs to improve performance relative to one another, and to provide customers with information about the services they are receiving.

5.124 When comparing financial performance, the report includes information for each DNSP on: the levels of energy distributed broken down by distribution tariff, the return on assets, revenues, operating expenditure and capital expenditure. The data compared include historic data and are summarised in tables and charts.

5.125 Reliability of supply is a measure of the level of availability of gas supply to customers. The report considers performance indicators for the average customer's time off-supply, interruption frequency, number of outages on the supply network and major supply interruption events. In reviewing gas supply reliability, AER looks at trends in performance over a period of time to take into account the fact that there can be significant short-term variations in reliability measures that are not directly related to changes in the condition of the gas supply network.

---

[83] AER, Victorian Gas Distribution Business Comparative Performance Report 2008 http://www.aer.gov.au/content/item.phtml?itemId=736841&nodeId=9757a716e48b9cbc22aa66d1f597d4b2&fn=Victorian%20DNSP%20gas%20comparative%20performance%20report.pdf

5.126 In considering network integrity, the report considers data on the average number of unrepaired gas leaks for 2008, repaired leaks per kilometre of gas pipe, the number of kilometres of mechanical damage to mains, the number of incidents per 1,000 customers, and the cumulative number of kilometres of low-pressure gas network replacement. This data are presented in the form of charts and tables for each DNSP for a number of years.

5.127 The levels of customer service achieved by the DNSPs are measured by:

(a) DNSPs' performance in responding to customer calls about serious incidents;

(b) meeting customers' appointments on time;

(c) making supply connections;

(d) maintaining supply reliability above the minimum reliability level; and

(e) the proportion of complaints received by the DNSPs, and received for full investigation by the Energy and Water Ombudsman (Victoria) (EWOV).

5.128 This comparative performance report is based on information provided by the DNSPs on network performance and customer-service statistics, and complaint information supplied by the Energy and Water Ombudsman (Victoria) (EWOV). All gas DNSPs are required to undertake an independent compliance audit in accordance with the Essential Services Commission of Victoria's (ESCV) Gas Industry Guideline. The audit report, prepared by the AER, concluded that overall businesses achieved a ±5 per cent or better accuracy with regard to the service performance indicators, which was deemed by the AER to be a reasonable level of accuracy.

National Water Commission, Australia: National Performance Report[84]

5.129 A key commitment in Australia's National Water Initiative is annually to benchmark water pricing and service quality of urban and rural water service providers in separate reports, independently and publicly. Urban and rural water service providers are considered separately due to the differences in the nature of urban and rural water industries. Different performance-reporting models apply to urban and rural water delivery agencies.

5.130 The report is the national source of information on the performance of rural water service providers, and is intended to provide information for government agencies, rural water service providers, customers and community stakeholders.

---

[84] NWC, National Performance Report
http://www.nwc.gov.au/www/html/2765-national-performance-report-2008-09---urban-water-utilities.asp?intSiteID=1

5.131 The annual performance report for urban water companies contains data from 73 utilities from every state and territory in Australia, on 117 performance indicators. The report presents comparative tables and charts with accompanying commentary and analysis.

5.132 The data are grouped under the following headings:

(a) Water resources:

- The volumes of water abstracted to supply the firm's customers in the reporting period. It may also provide an indication of the diversity of supply sources, potential environmental issues, and water treatment issues; and feed into understanding the relative operating and total cost of water to the utility compared to other utilities.
- The volumes of water supplied.
- Volume of sewage collected by the utility.
- Volume of recycled water supplied.

(b) Asset data:

- Number of water treatment plants providing full treatment. This indicator can also provide a partial explanation of a utility's relative operating cost and total cost. For example, a utility providing full treatment for most of its supply would have a significantly higher cost base than one providing lesser treatment (e.g. disinfection only).
- Length of water mains and other properties. This provides an indication of the ease or difficulty of delivery of water to customers and is used as a normaliser for a number of other indicators. It is independent of source assets so as to facilitate comparison of water schemes.
- Sewerage assets.
- Recycled water treatment plants. This indicator can provide a partial explanation of relative operating and total costs.
- Water main breaks, water mains loss, and sewerage breaks.

(c) Customers:

- Connected properties and population.
- Quality of service indicators.

(d) Environment:

- Number of treatment plants, sewerage treatment levels and compliance.
- Greenhouse gas emissions.

(e) Pricing and finance.

5.133 Ensuring the integrity of data in the National Performance Report is considered to be an essential element of the benchmarking process by the NWC. To ensure that stringent data quality procedures and processes can be met, data contained in the report are "locked down" in November of each year. In the event that data are subsequently found to be erroneous, the incorrect data are denoted with an asterisk and the correct figures are reported in an erratum section of the report.

5.134 The annual performance report for rural water companies publishes comprehensive data for 12 rural water service providers across Australia. The threshold for including a rural water service provider is that the additional recurrent costs incurred by that organisation in relation to data collection, reporting and required audits are less than one per cent of the total revenue associated with the provision of rural water services. Where the recurrent costs of reporting exceed this threshold, rural water service providers are not required to report; however, they are encouraged to do so in the interests of industry transparency.

5.135 Unlike the urban report, which provides comparative tables as well as individual reports for each utility, the rural report only provides reports on individual company performance.

5.136 Data collected have been collated in four sets:

(a) detailed characteristics: for example, the number of rural water services provided, asset types, customer information, area covered;

(b) Customer Service indicators (e.g. number of complaints);

(c) environmental indicators: greenhouse gas emissions, environmental management;

(d) financial indicators.

Ofcom: Comparing the service of internet service providers[85]

5.137 Ofcom began research in 2008 into the performance of UK fixed-line residential broadband connections with respect to actual broadband speeds. The aim of the report is to be a reference source for consumers and other stakeholders, to ensure that consumers have the clearest possible information about broadband services. In line with this aim,

[85] Ofcom, UK broadband speeds, May 2010: The performance of fixed-line broadband delivered to UK residential consumers http://stakeholders.ofcom.org.uk/binaries/research/telecoms-research/bbspeeds2010/bbspeeds2010.pdf

key technical terms and statistical concepts are explained and data are presented using simple metrics.

5.138 Ofcom commissioned this independent research since there was previously limited robust research available on actual broadband speeds. Ofcom expects to publish further reports at approximately six-monthly intervals.

5.139 The focus of the report is on average download speed and how this varies by a range of variables, including: geographical location, time of day, access technology and Internet Service Provider (ISP) package. The report presents the findings from the research which involved the collection and interpretation of over 18 million data points. Ofcom included comparative data for those ISP packages for which sample size was large enough to make the analysis statistically meaningful.

5.140 Ofcom used statistical techniques to adjust the results to ensure that they are representative of the UK broadband population as a whole. This included weighting the results according to the rural/urban split, geographic market definition and ISP. For the provider-specific comparisons, Ofcom normalised the data for Digital Subscriber Line (DSL) operators by distance from exchange; this was necessary in order to provide like-for-like comparisons of ISPs who have different customer profiles. The weightings applied were also validated by a market research company.

Analysis of approach

Pros

5.141 Providing customers with information about the services they are receiving helps to remove the asymmetry of information that exists between firms and customers. This enables customers to compare aspects such as cost and service quality across a number of providers. Providing information to customers could be particularly useful where there is at least some competition in the market and where regulation is relatively light-touch. Having well-informed customers could help make competition more effective, through customers making better-informed purchasing decisions and potentially switching provider.

5.142 Providing information can also help with dissemination of best practice across regulated firms. The “naming and shaming” of poor performers can be effective in encouraging firms to adopt best practice.

5.143 Publishing comparative information about firms can help to encourage competition between firms, and pressurise them into improving their relative performance. Focusing on reputational impacts by using comparisons may also provide a company with particularly strong incentives to improve performance if performance has been significantly below standard. The effectiveness of reputational incentives, however, is dependent on the importance that the firms place on outperforming other firms, which may be influenced by the extent of the pressure applied by customers and other stakeholders, including investors.

5.144 Publishing comparable information provides a snapshot of the industry which can help in making informed policy decisions. It promotes transparency within the industry. It can also help with internal sharing of information within the regulatory body.

5.145 Where the regulator collects the data for other regulatory purposes, publishing this information in a way that allows comparisons of performance to be made by customers and other stakeholders would not have significant costs associated with it and may reap considerable benefits in a market in which competition is developing.

Cons

5.146 The benefits to competition from having informed consumers are dependent upon the extent to which customers understand the information and act upon it. Where the barriers to switching providers are high in terms of time and cost to the customer, then customers may stay with the same provider, regardless of its performance, which reduces the power of this tool to improve the performance of firms.

5.147 In markets where customers do not have the option to switch providers, or to exert any pressure on them, the value of providing comparable information may be limited, since firms have little incentive to improve their performance relative to their peers.

5.148 A further drawback of the use of comparators in this way is that it may generate unrealistic expectations among consumers (to the extent that they pay attention to the relative ranking of firms) who may not take into account the cost of improving performance. For instance, consumers may expect their water company to achieve the same performance as other water companies while not recognising that there are exogenous factors (e.g. regional geography or rainfall levels) which may make it costly (and perhaps inefficient) for it to do so.

5.149 If the regulator is providing information to customers that could influence their purchasing decisions, the regulator must be reasonably confident as to the robustness and comparability of the data. Where the information is not already being provided to or being collected by the regulator, this could impose additional costs on the firms and the regulator. If the data are used to calculate some score or indicator, the regulator must also be careful of the methods and weightings used to make comparisons, since different approaches may result in different rankings of companies.

Applicability to Ofwat

5.150 Ofwat already makes use of information provision to incentivise company performance. The new Service Incentive Mechanism (SIM) developed by Ofwat provides information in the form of league tables to consumers and other stakeholders about the best and worst levels of service from companies.

Data issues

5.151 The data required to provide information will depend on what information Ofwat thinks it is important to publish publicly. Where Ofwat already collects the data, collecting the data would not be an issue for implementing this tool (although additional work on cleaning data may be necessary if Ofwat does not already do this for another purpose). Potential market reform may mean that further data collection is required in relation to newly defined activities (such as system operation).

5.152 Where the objective is to provide information, it is particularly important that the data are comparable and the comparisons robust. The publishing of incorrect or inaccurate information could have detrimental impacts on the efficient functioning of the market; for example, where consumers are using this information to inform their purchasing decisions, or if incorrect information incentivises firms to alter their performance in perverse ways.

Potential value of comparisons

5.153 In the current non-contestable parts of the retail market, reputational incentives are likely to be less powerful than in markets where competition exists. However, providing information to consumers can act as a check on companies' incentives to charge higher prices or provide poor quality service, since customers may be able to pressurise poorly-performing firms into changing.

5.154 Providing information can help with dissemination of best practice across regulated firms. The "naming and shaming" of poor performers (or conversely, the "naming and acclaiming" of good performers)[86] can sometimes be effective in encouraging firms to adopt best practice.

5.155 Publishing comparative information is used by regulators to provide a snapshot of the market, which can be useful to improve transparency within the industry and encourage engagement with consumers and other stakeholders.

5.156 Where the regulator collects the data for other regulatory purposes, publishing this information is unlikely to have significant costs associated with it.

Impact of potential market reform

5.157 Potential market reform could increase the role played by the provision of comparative information to customers and other stakeholders. In particular, reputational incentives could become more important if competition develops in contestable parts of the value chain, since firms would have stronger incentives to take account of the impact of their

[86] Ofwat 'Water demand and supply policy' as part of PR09 Phase Two, November 2008. Accessed http://www.ofwat.gov.uk/pricereview/pr09phase2/pap_pos_pr09supdempol.pdf

decisions on customer perceptions. Providing information to consumers may be valuable in allowing customers to make informed decisions about whether to switch provider, thus facilitating effective competition between providers. Publishing comparable information may work well within a lighter-touch approach to regulation, as well as in areas where competition develops sufficiently to allow regulation to be removed altogether.

5.158 However, Ofwat will need to consider whether it should publish such comparative information itself, or whether it should leave the market to provide any comparative information which customers may demand. In many sectors of the economy, the market itself may provide consumers with such comparative information – for example, the organisation *Which?* routinely reviews the range of available products and advises consumers on best buys for many consumer products. In some utilities sectors (e.g. energy), there are websites that consumers can use to find the best tariff available to them. There is clearly a danger that the publication of comparative information by Ofwat will displace information provision by the market.

5.159 One possible way to decide which information Ofwat should publish and which should be left to market provision, would be on the basis of whether third parties would be in a position to collect the necessary data. For instance, assuming both incumbents and entrants are required to publish their tariffs, third parties would be in a position to provide customers with advice on which company offers the best tariff for them. On the other hand, comparative information on (say) environmental performance may not be available to third parties, and hence there might be a role for Ofwat to publish comparative information in areas such as this so that customers who care about such issues can factor this information into their decision-making.

5.160 The publication of comparative information could also have a role, albeit possibly a lesser one, for less contestable parts of the value chain (such as network activities). Although the provision of comparative information for these activities would not support competition, it may nonetheless have some impact on firms' behaviour and may encourage the spread of best practice.

To Set Prices Directly

Description

5.161 Regulators can use comparative analysis directly to set the prices that firms can charge customers. This might involve:

(a) pegging prices for small companies to prices charged by larger regulated firms;

(b) pegging prices for certain customer groups to prices for comparator customer groups;

(c) pegging price levels in a sector against comparable firms in other countries (or possibly other sectors).

5.162 In some cases, it may be appropriate to take into account underlying factors which may lead to cost differences between the firms or customer groups (e.g. relating to the services provided or the location). This can be done by specifying the permitted gap between the prices which are being pegged and the comparator prices. Fixing the differential between prices in this way is known as "relative price regulation".

Practical examples

Ofgem: Independent Gas Transporters

5.163 Independent Gas Transporters (IGT) develop, operate and maintain local gas transportation networks. These are relatively small compared with the networks operated by Gas Transporters. Independent Gas Transporters' networks are directly connected to the gas distribution network via a connected system entry point, or indirectly to the gas distribution network via another Independent Gas Transporter.[87]

5.164 Ofgem introduced Relative Price Control (RPC) to regulate IGT transportation charges in January 2004. RPC requires that IGT charges to all new customers should be capped at a level broadly consistent with the Gas Distribution Network (GDN) equivalent charge.

5.165 The charging cap, i.e. the maximum charge the licensee may charge for each premises in a given year, is based on the distribution network's single supply-point charges for premises and its connected system exit-point charges.[88]

Ofgem: Inter-customer groups

5.166 In January 2009, Ofgem released a consultation paper on proposals to address unfair pricing differentials in the retail energy supply markets.[89] Relative price controls were considered, whereby Ofgem would set *ex ante* limits on the amount that suppliers could charge over a benchmark tariff to customers paying by different payment methods. The premium (or discount) would be set based on Ofgem's assessment of the costs associated with providing the specific payment method. A relative price control relating to geographical areas, where *ex ante* price limits would be set on the differences in prices for equivalent tariffs offered to "in-area" and "out-of-area" customers, was also consulted upon.

5.167 This process followed a seven-month enquiry in 2008, which found that the price difference between paying by pre-payment meter and direct debit had increased from around £80 in 2005 to £118 in 2008; while the difference between paying quarterly and by

---

87 Ofgem, The regulation of Independent Gas Transporter charging: Consultation document, May 2002 http://www.ofgem.gov.uk/Networks/GasDistr/IGTReg/Documents1/396-16may02.pdf

88 Ofgem, Guidance for the calculation of the PC price cap; http://www.ofgem.gov.uk/Networks/GasDistr/IGTReg/Documents1/a5_app_form_41111.pdf

direct debit had doubled to £80. The enquiry formed part of Ofgem's review of competition in the gas and electricity retail supply markets ("The Probe"), and related to one of the areas where Ofgem identified the need to accelerate the transition to competitive markets.[90]

5.168 Whilst relative price controls were not adopted, Ofgem subsequently modified the Standard Conditions of the Electricity and Gas Supply Licences (SLCs); introducing, with effect from 1 September 2009:

(a) SLC 27.2A, requiring that any difference in the terms and conditions offered in respect of different payment methods is cost reflective; and

(b) on a temporary basis, SLC 25A, prohibiting undue discrimination between terms and conditions offered to different groups of customers.

5.169 Overall, Ofgem's actions have been successful in delivering substantial reductions in the tariff differentials identified during "The Probe". In the majority of cases, the remaining differentials are now consistent with Ofgem's understanding of the differences in costs.[91]

ACCC: Domestic transmission capacity service pricing

5.170 In late 2010, in the context of telecommunication regulation, the ACCC published a position paper on pricing the domestic transmission capacity service (DTCS).[92] A number of approaches to setting prices had been considered and consulted on, such as bottom-up long-run incremental cost; top-down long-run incremental cost; and Fully Allocated Cost.[93]

5.171 However, the ACCC considers that, in the case of transmission services, current regulatory and statutory reporting requirements on firms do not provide the level of granularity to assess the underlying cost of transmission services. Significant changes to the regulatory accounts would be needed to enable appropriate adjustments to be made (e.g. for disaggregation, optimisation and efficiency) which would be time-consuming and burdensome to implement. It was thus decided that the data currently available in service

---

89 Ofgem 'Addressing unfair price differentials' 2009 http://www.ofgem.gov.uk/Markets/RetMkts/ensuppro/Documents1/Consultation%20on%20addressing%20unfair%20price%20differentials.pdf

90 Ofgem 'Energy Supply Probe - Initial Findings Report' October 2008 http://www.ofgem.gov.uk/Markets/RetMkts/ensuppro/Documents1/Energy%20Supply%20Probe%20-%20Initial%20Findings%20Report.pdf

91 Ofgem 'Update on Probe Monitoring: tariff differentials and consumer switching' July 2010 http://www.ofgem.gov.uk/Markets/RetMkts/ensuppro/Documents1/Update%20on%20Probe%20Monitoring_FINAL.pdf

92 Domestic transmission capacity services are high capacity wholesale data services. These services are the 'building blocks' for voice, data and other communications between transmission points located in Australia. Carriers and carriage service providers can use the transmission capacity service to set up their own networks for aggregated voice or data channels.

93 ACCC: 'Domestic Transmission Capacity Service Pricing: An ACCC Position Paper on pricing the domestic transmission capacity service' November 2010

providers' internal accounts and the regulatory accounts do not contain sufficient detail to establish suitable market prices.

5.172 Instead, a benchmarking approach was favoured. The ACCC regards domestic transmission routes and areas that are not subject to regulation under the DTCS Declaration as relatively mature markets served by a number of service providers, and considers that prices in these competitive areas and on competitive routes are broadly reflective of costs. The ACCC considered that pricing information from competitive routes would therefore provide a reasonable indication of prices that would prevail in a competitive market, and would be a useful basis for prices and price structures on non-competitive routes.

5.173 The ACCC also indicated that benchmarking the prices of routes and areas that are competitive could be implemented without significant changes to the regulatory accounts' framework.

5.174 Whilst the main comparators would be prices in competitive domestic routes, the ACCC recognised that these may be a limited source of information; and thus suggested using data from international benchmarking reports and price estimates calculated from route-based pricing models to provide a range of prices to feed into the pricing approach.

5.175 The final approach proposed by the ACCC consists of the following steps:

(a) obtaining extensive pricing information directly from service providers;

(b) analysis of pricing information to establish a range of prices for declared and non-declared routes according to the basic cost drivers of distance and capacity;

(c) comparisons of the newly established prices with other available transmission cost and price data;

(d) determination of a range of recurring and non-recurring prices and charges for declared transmission services.

5.176 The ACCC considers that this benchmarking approach could be completed fairly quickly.

Analysis of approach

Pros

5.177 Using comparators to set prices directly can be a valuable tool in situations where data on underlying costs are not available or suitable for other approaches, such as cost modelling or efficiency analysis. Similarly, where the cost base for a particular service is difficult to define, then setting prices on the basis of comparative analysis of prices could be more appropriate.

5.178 Setting prices directly using comparators can also avoid complex cost-modelling exercises and reduce the burden on the regulator. Firms may also not have to undertake burdensome data-reporting. Hence, this approach may be particularly suitable when setting prices for small networks where a detailed determination of prices may be disproportionate.

5.179 Further, the use of relative price regulation can be a useful transitional form of regulation, once competition has begun to develop in contestable parts of the value chain. In particular, the regulator can specify the maximum gap between prices in the less competitive segments of the market and prices in the most competitive segments (providing protection to customers who have thus far benefitted least from competition) while avoiding the need to carry out detailed price reviews.

Cons

5.180 A disadvantage of using comparators to set prices directly is that it may be difficult to find suitable comparators which closely reflect the situation of the regulated firms. Comparator prices may embody a range of differing underlying factors, and using them to set prices directly without sufficiently accounting for all factors (which actually may not be possible) may lead to inaccurate and inefficient pricing. This is likely to be the case particularly when using international comparators.

5.181 In the absence of any other approach, regulators will need to be very confident in the appropriateness of the comparators that they use to set prices. Where there are reasons to doubt the suitability of any individual comparator, this may require a large number of comparators.

5.182 The behaviour of firms could in theory be distorted by the use of relative price regulation to specify the difference in prices that firms can charge customers, in the more competitive and less competitive segments of the market, respectively. In particular, the firms may have an incentive to compete less aggressively on price in the competitive segment, to avoid having to reduce prices in the less competitive segment.

Applicability to Ofwat

5.183 In practice, if Ofwat were to apply this approach it is likely that it might take one of the following forms:

(a) pegging the prices that can be charged by inset appointees to the regulated prices charged by Water and Sewerage Companies (WaSCs) or Water Only Companies (WoCs);

(b) using relative price regulation to limit the differential in prices for customer groups that are, respectively, outside and inside the tariff basket;

(c) once competition has begun to develop in the sector, using relative price regulation to limit the differential in prices between more and less competitive segments of the market, as a transitional form of regulation.

Data issues

5.184 Using comparators to set prices directly, would require the collection of robust pricing data from companies that reflect similar characteristics and underlying factors to those regulated by Ofwat. Ofwat would need to have a large degree of confidence in the comparability and relevance of the information.

5.185 Nonetheless, in general it is likely that this approach would reduce data requirements, since it would not need the same amount of data on costs as is necessary for a cost-based determination of price limits.

5.186 In the case of relative price regulation, some cost data may still be required to determine what would be an appropriate gap in prices to specify, based on underlying cost differences. However, in this case, Ofwat might only need to collect cost data in those areas identified as having significantly different costs.

Potential value of comparisons

5.187 Ofwat already monitors changes in the difference between large-user and household charges each year, to make sure that charges for both groups of customers are neither unduly preferential nor unduly discriminatory. In addition, using comparators to set prices directly could lead to a reduction in the resources required by Ofwat to conduct cost-efficiency analysis, and also to reduced reporting requirements for firms.

Impact of potential market reform

5.188 In our view, there are two possible ways in which this approach might become useful within the context of potential market reform.

5.189 The first possibility relates to a scenario in which Ofwat wishes to encourage competition through wider use of new appointments and variations (NAVs).[94] Ofwat currently pegs prices for new appointees to regulated price limits for incumbent water companies. This represents a light-touch, predictable approach to setting price limits for these firms, and it potentially allows applications to be assessed more quickly. Hence, this approach potentially reduces entry costs for inset appointees and encourages this form of competition.

[94] We note that, since the inset appointment process replaces one monopoly undertaker with another, it only permits competition *for* the market rather than *in* the market. Hence, this may or may not be a form of competition which Ofwat wishes to encourage.

5.190 The second possibility relates to the use of relative price regulation as a transitional form of retail price regulation once competition has begun to develop in the contestable parts of the sector, in a context in which competition has developed further for some customer groups than others. In this scenario, Ofwat could remove retail price controls[95] while using relative price regulation to limit the gap in prices between more and less competitive segments of the market. If retail competition continued to develop, it might eventually be possible to remove the relative price cap as well.

5.191 It could also be possible to use relative price regulation to link prices in the household sector to prices in the more competitive non-household sectors. However, this is likely to create incentives for firms to increase prices for business customers (even though this would lose them market share in the non-household sector) in order to be able to charge higher prices in the household segment of the market.

To Set Cost Allowances

Description

5.192 Determining an efficient level of costs that a company should be allowed to recover from its customers is often a key objective of regulators. Setting specific cost allowances can be one way of ensuring that firms do not incur inefficient or unnecessary costs and pass these onto consumers. However, given information asymmetry between regulators and regulated companies, determining cost allowances can be challenging. By overstating costs and persuading the regulator to set higher price limits, companies can more easily outperform their allowed costs and earn higher profits as they would usually be allowed to keep any revenue they are able to make after allowed costs (at least until the next price review).

5.193 Regulators can therefore use comparative techniques to help them in assessing an efficient level of costs. More specifically, the use of comparisons can help the regulator to assess the relative efficiency of firms within the industry so as to identify the company or companies at the efficiency frontier, and these firms can then be used as the cost benchmark for other firms within the industry. The results of these comparisons can be factored into the process of setting cost allowances, and can be used to create incentives for cost efficiency.

5.194 Comparisons can be made for separate categories of costs (e.g. operating costs and capital expenditure) or for total costs. The results of the comparisons may be used to set cost allowances for the price control period, or to determine the cost allowance for additional *ad hoc* projects approved within the price control period.

---

[95] Clearly, price limits would still need to be in place for monopoly parts of the value chain.

Practical examples

Ofwat: Assessment of capital efficiency

5.195 When Ofwat assessed company investment plans at the last price review, they considered a number of factors such as the need for the investment, whether the plans represented the best way of meeting the identified need, and whether the plans had been appropriately costed. Ofwat also assessed the relative efficiency of each company through the cost base comparative tool, using data derived from the same cost data and estimating systems and procedures used to cost these investment plans. Ofwat used the results to set its baseline level of investment in the Capital Expenditure Incentive Scheme (CIS).

5.196 Ofwat used the cost base tool to assess each company's procurement and delivery efficiency, and to adjust proposed investment to an achievable level of efficiency that could be expected for a middle-ranking company. Ofwat based this on a median-performing company.

5.197 Adjustments are made to the cost allowances depending on how efficient the companies' plans are in relation to the central estimate. As mentioned, the comparative efficiency of companies' investment plans are not the only factor in determining the cost allowances, and adjustments are also made if the nature, scale or cost of the proposed investment are not considered appropriate or robust.

5.198 Ofwat has indicated that including international data or data from other sectors in the cost base would be useful, but that concerns regarding consistency and comparability have prevented it from doing so.[96] Ofwat made adjustments to the cost base data to account for regional cost differences in construction prices and salaries and, for this purpose, used information provided to the Office of National Statistics (ONS) by the Building Cost Information Service (BCIS).

5.199 The use of comparative analysis is seen by Ofwat as a useful way of guiding its expectations as to what constitutes efficient expenditure, ensuring that its challenges are realistic. This makes it a powerful tool to drive improvements across the industry.

[96] Ofwat internal questionnaire: Capital Maintenance

Ofgem: Comparative benchmarking of network investment and operational costs

5.200 For the Electricity Distribution Price Control Review 5 (DPCR5), Ofgem made use of efficiency benchmarking as part of the process of setting cost allowances.[97] The approach to cost assessment consisted of four steps:

- reviewing the distribution network operators' (DNOs') forecasts;
- carrying out modelling and benchmarking work;
- considering evidence on why the DNOs' forecast volumes or costs differ from Ofgem's benchmarks; and
- forming an overall view on the appropriate baseline level of costs from DPCR5, taking this and wider evidence into account.

5.201 In setting operating cost allowances for firms, Ofgem used comparative benchmarking analysis to inform its view of efficient costs in 2008-2009 for each DNO, and then rolled forward these efficient costs to DPCR5. For network investment, Ofgem assessed the business plans of DNOs in relation to the results of benchmarking work (taking into account certain factors such as age profile of assets) to ensure that the DNOs' cost proposals were reasonable and efficient. The most efficient firms had their business plans approved with fewer adjustments than less efficient firms. In most cases, benchmark costs for less efficient companies were brought into line with those that were more efficient so that consumers would not carry the costs of inefficient operations.

5.202 Ofgem carried out benchmarking at different levels of disaggregation, breaking costs down into a number of categories (such as core-network investment, non-core investment, network-operating activities, indirect activities[98] and non-operational capex) and also conducting top-down regressions of overall costs. Ofgem used different benchmark levels (e.g. at the frontier, the upper quartile etc.) for each cost category, depending on the robustness of the benchmarking results or the quality of the underlying data. However, Ofgem does not set cost allowance for each separate cost category, and is of the view that DNOs must manage their costs in the way they consider appropriate to meet their obligations.

5.203 In some cases, such as with network operating costs (i.e. inspections and maintenance) Ofgem viewed benchmarking results as being weaker than elsewhere, possibly due to a

---

97 Ofgem (2009): 'Electricity distribution price control review final proposals – Allowed revenues – Cost assessment' http://www.ofgem.gov.uk/NETWORKS/ELECDIST/PRICECNTRLS/DPCR5/Documents1/FP_3_Cost%20Assessment%20with%20SS%20comments.pdf

98 As noted in Ofgem's Electricity Distribution Price Control Review Final Proposals, indirect costs include "indirect costs closely associated with network costs" and business support. http://www.ofgem.gov.uk/Networks/ElecDist/PriceCntrls/DPCR5/Documents1/FP_3_Cost%20Assessment%20with%20SS%20comments.pdf)

lack of sufficient consistency in the reporting applied by DNOs to this cost category. In order to address the data issues, Ofgem proposed to use a hybrid approach which brought DNOs with costs higher than the average down to the average level of efficiency; and benchmarked those DNOs in the top 25 per cent at the upper quartile level of efficiency. Those companies between the upper quartile and average were given their own level of costs.

5.204 According to Ofgem, comparative benchmarking analysis is not appropriate for all categories of costs (e.g. lumpy costs where it is difficult to conduct robust comparisons across the DNOs, or costs that are specific to particular DNOs). In these cases, other techniques are used in addition to benchmarking, such as examining historical levels of costs, industry trends and DNO forecasts. There were also areas where Ofgem needed specialist support in carrying out the analysis, and for this Ofgem appointed consultants to undertake detailed reviews. Ofgem then included the costs identified through the reviews in the benchmarking process, to quantify the impact of making different assumptions on its regressions.

Analysis of approach

Pros

5.205 The use of comparators can enable regulators to assess what constitutes efficient and reasonable expenditure and help them to set cost allowances for firms that reflect this. It also helps regulators overcome information asymmetries between themselves and individual firms, and provides a basis against which to challenge company expenditure plans. In this way regulators can ensure that customers do not carry the costs of unnecessary investment or operational inefficiencies.

5.206 Using comparators in setting cost allowances increases the information available to regulators (over and above other sources such as expert review or research) and may avoid the risk of setting caps that are inappropriate.

Cons

5.207 Acquiring sufficient and robust comparative data to set cost allowances can be challenging for regulators. Although data requirements will vary according to the comparative method used (e.g. benchmarking using regression techniques will be more data-intensive than using simple metrics), regulators need to be confident in the results of the comparisons if they are to use them directly to set cost allowances.

5.208 Setting cost allowances by using comparators can be particularly challenging where expenditure across firms (typically capital-expenditure projects) is highly bespoke and influenced by a range of different underlying factors, and thus the number of relevant comparators is reduced. This can make comparing expenditure plans across firms and identifying an ”efficient” level of expenditure to include in cost allowances difficult.

5.209 Comparisons of just opex or just capex to set separate cost allowances for opex and capex can fail to take into account trade-offs between the two. As assets reach the end of their useful life, the level of opex required to maintain them is likely to increase; similarly, increases in capex for asset-replacement should reduce opex requirements. Ineffective management of this trade-off could, for example, result in excessively high maintenance costs being incurred where replacement of the assets in question would have been more efficient.

Applicability to Ofwat

5.210 Comparisons of costs are fundamental to Ofwat's current approach to setting price limits in the water and sewerage sectors. Ofwat used comparative analysis in setting cost allowances for all capital expenditure (through the cost base model) and in calculating the catch-up efficiency rate it applies to companies' operating expenditure at price reviews.

Data issues

5.211 A significant amount of effort is required to ensure that the data used in the cost base model are comparable and consistent with the defined information requirements. In addition, the existence of a sufficiently large number of comparators is crucial for the successful application of benchmarking techniques. A larger sample leads to more precise estimates of both the effects of cost drivers and efficiency levels, and more comparators means there is more variety of approaches in the industry and the implementation of the scheme is less subject to collusion among regulated firms. Ofwat already collects a significant amount of information in this area (for example, through June Returns and business plan submissions at price reviews).

Potential value of comparisons

5.212 Using comparators as part of the cost-setting process has the advantage of enabling Ofwat to assess what an efficient and reasonable level of expenditure for firms should be. Although cost allowances are not set directly from the results of comparisons, the process provides Ofwat with a basis from which to challenge company investment plans whilst taking into consideration other sources of information and accounting for company-specific factors.

5.213 Approaches to measuring the value of comparators (for the purpose of assessing efficient costs) have been examined in a number of past studies (although in most cases this relates to the value of a marginal comparator rather than the value of carrying out comparisons *per se*). These have been conducted in light of merger cases, where the loss of a comparator is an important issue.[99] An example is the approach taken by the

[99] If, as a result of a loss of a comparator through merger, the regulator's ability to set price controls which accurately reflect the potential for future efficiency improvement is constrained, then consumers may face charges which are higher than they would otherwise be.

Competition Commission (CC) in its inquiry into the completed merger between South East Water and Mid Kent Water in 2007. Using the bootstrapping statistical technique, Ofwat data were sampled about 1,000 times and Ofwat's regressions re-estimated each time and the standard errors were compared with those derived directly from Ofwat's models. The CC looked at the marginal increase in the width of the confidence interval after the loss of the specific comparator. This marginal increase was then used to compute the change in the distance from the estimated efficient frontier as the number of comparators was reduced. The CC concluded that the loss of the comparator under consideration would have a small detrimental impact, estimated in the range £1 million – £10 million over a 30-year period.[100]

5.214 Ofgem undertook an approach based on the different cost savings assumptions that were deemed feasible in electricity distribution (where comparisons were available) and electricity transmission (with no comparators). As cited in the Vivendi Water UK and First Aqua inquiry, Ofgem calculated that the loss of an electricity distribution company as the result of a merger was £32 million in 2001-2002 prices.[101]

5.215 In its inquiry into the merger of Vivendi Water UK and First Aqua in 2002, the CC received estimates of the value of the loss of a comparator from Ofwat (the then Director General of Water Services, DGWS).[102] The DGWS' methodology was based on the possible loss of catch-up efficiency gains that could be made if a comparator was used as the benchmark firm at a periodic price-review. The illustrative work carried out indicated that the loss of a company the size of Southern (owned by First Aqua) as an independent comparator, assuming that it was a benchmark company, could have a very substantial adverse effect on price limits set for England and Wales; and that aggregate target-operating expenditure, expressed in terms of the net present value over a 25-year period for water services alone, would be higher under different assumptions by between £330 million and £1,330 million, with an average value of £450 million. The loss of a small local company the size of Folkestone and Dover Water Services[103] using the same methodology, ranged between £10 million and £530 million, with an average value of £40 million.[104]

---

100 Competition Commission 'South East Water Limited and Mid Kent Water Limited: A report on the completed water merger of South East Water Limited and Mid Kent Water Limited' May 2007
http://www.competition-commission.org.uk/rep_pub/reports/2007/fulltext/525.pdf

101 Competition Commission: Vivendi Water UK PLC and First Aqua (JVCo) Limited: A report on the proposed merger - Appendix 5.5 November 2002
http://www.competition-commission.org.uk/rep_pub/reports/2002/fulltext/472a5.5.pdf

102 Competition Commission: Vivendi Water UK PLC and First Aqua (JVCo) Limited: A report on the proposed merger - Appendix 5.4 November 2002
http://www.competition-commission.org.uk/rep_pub/reports/2002/fulltext/472a5.4.pdf

103 One of Vivendi's Water Only companies, which would be absorbed into Southern as a result of the merger.

104 The DGWS noted that this approach to valuing the loss of a comparator was only partial in that it did not address the loss of data available for use in the regression analysis or for other monitoring purposes, and the resulting estimates could not therefore be used as an indication of the full value of the loss of a comparator.

5.216 However, in a recent academic paper that has sought to address this issue, Kumbhakar and Horncastle (2010)[105] argue that, in general, the merger of two water companies cannot be assumed to have the same effect on precision of estimates as the simple loss of a comparator. This is because, as a result of the merger, the industry composition changes, not only the number of observations and, as a result, they conclude that prior to a merger it is not possible to determine whether or not the merger would ultimately lead to a decrease or increase in the confidence intervals, width of regression parameters and of predicted costs.

Impact of potential market reform

5.217 In the longer term, if potential market reform results in increasing competition in the contestable segments of the value chain, and it is possible for Ofwat to employ lighter-touch regulation (such as monitoring prices), then there may no longer be a need to set direct-cost allowances for some activities.

5.218 In the transitional period when competition is still developing, Ofwat may not wish to drive prices downwards so hard with comparative efficiency analysis in setting price limits for incumbents in contestable parts of the value chain. This is because using regulation to drive down prices would reduce the headroom in prices for new entrants, potentially delaying the development of a competitive market (with the consumer benefits that this would be expected to bring). At the same time, entry into contestable segments would increase the availability of comparators (provided that the new entrants were required to submit sufficient cost data to Ofwat) which could improve the robustness of the cost comparisons.

5.219 Ofwat will need to continue to set price limits for non-competitive parts of the value chain (particularly network activities and potentially household-retail activities), even if competition replaces regulation in other parts of the value chain. Hence, there is likely to be a continued role for using comparisons to set cost allowances for monopoly activities.

5.220 If separate price controls are introduced for resources, network plus and retail - along with accounting separation - then the collection of comparative data may become more targeted (i.e. firms would report expenditure data relating to a more specific area of the business) and thus more disaggregated use could be made of comparators in setting cost allowances. Having separate price controls (whether these are binding or not) may also mean that cost allowances could be developed at a more granular level, which could involve the use of comparators from other sectors or countries (for example, isolating the household-retail part of the value chain and using an extended set of comparators to set operating-cost allowances).

---

[105] Kumbhakar, S and Horncastle, A. (2010), "Improving the econometric precision of regulatory models", Journal of Regulatory Economics.

5.221 As regards the system operation functions in the network plus business, Ofwat could undergo some process to set cost allowances or determine what the cost bases for the system operation service should be for each network plus business. The use of comparators here could be useful, particularly as little historical-cost evidence will be available to enable Ofwat to determine the efficient level of costs.

5.222 Under the current merger regime, all mergers are subject to a mandatory reference by the OFT to the Competition Commission where:[106]

(a) the turnover of the water enterprise being taken over does not or would not exceed £10 million; or

(b) the value of the turnover of each of the water enterprises belonging to the firm performing the takeover does not or would not exceed £10 million.

5.223 The CC must focus specifically on whether the merger prejudices the ability of Ofwat to make comparisons between different water companies. If the changes to the merger regime proposed in the Cave Review are adopted by the government, whereby retail-only mergers are removed from the requirement of automatic reference and the turnover threshold for other mergers is raised to £70 million, then there will be less scrutiny of the impacts of a loss of comparators resulting from mergers. This less-restrictive approach may result in an increase in the number of mergers taking place and a subsequent decline in the number of comparators available to Ofwat.

To Underpin Mechanistic Performance Incentive Scheme

Description

5.224 Incentive schemes can be introduced in a variety of ways to incentivise better performance. An incentive scheme can be either broad-based or more narrowly targeted. A broad-based structure covers all or most costs under a single structure, whereas a targeted scheme leaves most costs under existing forms of regulation and focuses on certain aspects of a utility's business. The two are not mutually exclusive; for example, a regulator could employ a price cap with a separate incentive scheme in place for quality of service.

5.225 The performance incentives offered by the regulator may be financial, reputational or a combination of the two.

5.226 Reputational incentive schemes are based on publication of information on the comparative performance of regulated firms. It allows the regulator, firms and consumers to compare the performance of one firm against another. Reputational incentives will only

[106] http://www.competition-commission.org.uk/rep_pub/rules_and_guide/pdf/cc9.pdf

be successful if regulated firms place importance on outperforming other companies; poor performance can place pressure on the firm in question to improve its performance so that it is in line with other firms in the industry.

5.227 Financial incentive schemes reward and/or penalise regulated firms depending on their performance relative to some target benchmark. This will typically involve some level of revenue exposure to the incentive scheme, and marginal rewards and penalties for changes in performance. In theory, the marginal rewards and penalties of the incentive scheme should be set between the firms' marginal cost of improving performance and the consumers' marginal willingness to pay for the improvement (provided the consumers' willingness to pay is greater than the marginal cost). Providing "correct" financial incentives will encourage firms to improve their performance, as long as it is cost-effective to do so relative to consumers' valuations of the benefits of improved performance.

5.228 Mechanistic performance incentive schemes can be introduced within a price control to incentivise better performance with regard to a variety of elements, for example, cost, quality of service, environmental performance, financial performance, security of supply and levels of innovation.

Practical examples

Ofwat: Capital Expenditure Incentive Scheme (CIS)[107]

5.229 During the last price review, Ofwat used the cost-base comparative tool to assess relative efficiency in procuring and delivering capital projects to derive baseline capital expenditure levels for the Capital Expenditure Incentive Scheme (CIS). This is done by comparing company estimates of capital works unit costs for a representative range of standardised capital projects (standard costs).

5.230 Under the CIS, each company recovers its actual capital expenditure plus or minus an incentive allowance that depends on its forecast of capital expenditure and its actual expenditure during the price control period. Therefore, the CIS provides incentives for companies to put forward efficient business plans before Ofwat's determinations, and encourages the companies to outperform Ofwat's price-limit assumptions after the determinations.

5.231 The CIS baseline includes: capital expenditure related to capital maintenance investment; expenditure to maintain and improve the supply/demand balance; expenditure to improve drinking water and environmental quality; resilience of services to external hazards; renewable energy generation projects; and enhanced service levels.

---

[107] Ofwat: Final determinations on price limits, PR09
http://www.ofwat.gov.uk/pricereview/pr09phase3/prs_web_pr09fd

5.232 The use of the CIS incentive mechanism is valuable as it mitigates the information asymmetry between the regulator and the regulated firms by incentivising firms to reveal their welfare-enhancing preference.

Ofwat: Operating expenditure incentive allowance[108]

5.233 The operating expenditure incentive allowance is an incentive mechanism that allows companies to retain the benefit of incremental outperformance of Ofwat's expectations of operating costs. A form of rolling pass-through was first introduced by Ofwat in the 1999 periodic review, which rewards a profile of increasing outperformance throughout the Asset Management Plan (AMP) period. In addition, there is an outperformance multiplier which increases the rewards of outperformance for those companies that Ofwat deemed to be leading the industry in terms of performance at the previous price review.

5.234 Ofwat made use of comparators for annual monitoring of companies' relative efficiency on operating expenditure. At price reviews, Ofwat has used an assessment of the base year to calculate the catch-up efficiency rate to be applied to companies' operating expenditure, using regression techniques to assess the relative efficiencies of companies' operating expenditure.

5.235 The use of comparators to determine the efficiency catch-up factor within an incentive framework is valuable as it provides firms with a financial incentive to reduce their operating expenditure. The use of rolling efficiency incentives reduces the periodicity of the incentives to realise any possible efficiency savings.

5.236 In PR09, the efficiency catch-up factor for base-operating expenditure assumes that a company will close 60 per cent of the assessed efficiency gap to the frontier performance by the end of the price review period, i.e. 2014-2015, with improvement happening in equal steps in each year.

Ofwat: The Overall Performance Assessment (OPA) and Service Incentive Mechanism (SIM)[109]

5.237 At PR09, Ofwat's incentive mechanisms included a performance-related adjustment to prices. A company that scored well on the OPA was allowed to charge its customers slightly more, while those that did not perform as well had to charge slightly less. In PR09 (as in previous price controls), Ofwat set the range of potential price limit adjustments from +0.5per cent to -1.0 per cent. The OPA used both comparative and absolute assessments of company performance against a range of measures. The comparative assessment used graduated performance bands set around mean performance. The water-only companies were compared with the five-year mean for water and customer services OPA for all 21 companies.

---

[108] *Ibidem.*

[109] Ofwat: Service and delivery – performance of the water companies in England and Wales 2009-10 http://www.ofwat.gov.uk/regulating/reporting/rpt_los_2009-10.pdf

5.238 Ofwat also took account of company-specific circumstances. Where a single element of the assessment materially affected a company's performance, or where a company score was very close to an adjustment band boundary, Ofwat considered what adjustment would be reasonable. In addition, to avoid penalising a company more than once for the same failure, Ofwat checked for any overlaps where the performance data for OPA adjustments were used for other decisions such as shortfalls or financial penalties.

5.239 The OPA combined reputational and financial incentives to encourage firms to improve the level of quality of service they provide to customers. If the OPA relied solely on reputational incentives there was a risk that the OPA would provide an incentive to firms to ensure that they do not fall too far behind the industry standard, rather than providing firms with incentives to outperform their peers. However, the incorporation of a price limit adjustment provided firms with a financial incentive to increase their performance with regard to quality of service in order to be able to charge higher prices.

5.240 Since April 2010, Ofwat has been using the Service Incentive Mechanism (SIM) which comprises:

(a) a quantitative indicator that measures complaints and unwanted contacts; and

(b) a qualitative indicator that measures how satisfied customers are with the quality of service they receive, based on a survey of consumers who have had direct contact with their water company.

5.241 The quantitative measure is a new approach, which has meant a change in the data that Ofwat collects.

Ofgem: Operating expenditure efficiency analysis[110]

5.242 In the 2007 price review for gas distribution networks (GDNs), Ofgem made use of regression analysis to assess the scope for efficiency savings by GDNs. Following the sale of four of the GDNs by NGG in 2005, this was the first time that Ofgem has been able to make meaningful comparisons between GDNs.

5.243 Ofgem's overall approach was to assess the efficiency of the GDNs by benchmarking the efficiency of individual activities within direct and indirect operating cost areas where it was practical to do so. Ofgem carried out more specific analysis for those areas where benchmarking was not practicable, or if the benchmarking results were not considered to be robust. Ofgem's combined approach of making use of both disaggregated and top-down analysis means that the overall level of allowances are determined by the top-down analysis, but the detailed benchmarking determines the allocation of allowances between GDNs.

5.244 The main reason for carrying out the benchmarking at an individual activity level was to increase the number of data points. If the analysis of total operating costs had been carried out, only eight data points would have been available (or possibly four if ownership groups were used). In addition, given the timing of GDN sales, there would only have been two years of data that could be used to determine any trends.

5.245 The direct operating activities benchmarked were: work management, emergency, repair, maintenance, and other direct opex. The costs were benchmarked based on the upper quartile of performance, i.e. using the lower-cost GDNs. These costs were then rolled forward to take account of the forecast number of repairs, Ofgem's assumptions on ongoing efficiencies; and real growth in the cost of contract labour, direct labour and materials.

5.246 Ofgem recognised in their final proposals that a potential weakness of benchmarking at the upper quartile level of costs for each individual activity is that it creates a benchmark that is not currently achieved by any GDN. Ofgem addressed this issue by applying an uplift on their disaggregated cost forecasts (based on the average difference between Ofgem's disaggregated benchmarks) and the top-down opex benchmarks (based on the upper quartile level of performance).

Analysis of approach

Pros

5.247 Benchmarking analysis allows the regulator to make use of data on other firms when assessing the performance of any individual company, and is thus capable of reducing the information asymmetry faced by the regulator.

5.248 In some cases, use of comparisons may mean that the regulator can define a performance target for an incentive scheme in terms of relative performance, which may be particularly helpful in circumstances where the appropriate absolute performance standard is hard to determine. For instance, an incentive scheme for quality of service could reward or penalise companies depending on whether they out-perform or under-perform the industry average.

5.249 The use of comparators to underpin mechanistic performance incentive schemes can be useful in creating reputational incentives if the results of the comparisons are published, provided that the companies place some importance on outperforming other companies. Focusing on reputational impacts by using comparisons may also provide a company with particularly strong incentives to improve performance if performance has been significantly below standard.

---

[110] Ofgem: Gas Distribution Price Control Review, Final Proposals, 2007
http://www.ofgem.gov.uk/Networks/GasDistr/GDPCR7-13/Documents1/final%20proposals.pdf

5.250 The use of comparators can also help to provide quantifications of the size of the expected improvements, which in turn can make it easier to provide "correct" financial incentives which will encourage firms to improve their performance - provided it is cost-effective to do so relative to consumers' valuations of the benefits of improved performance.

Cons

5.251 A principal drawback of using comparators in general, but particularly to underpin mechanistic performance incentive schemes, is that there may not be a sufficient number of comparators. This can reduce the robustness of the results and therefore the reliability of the benchmark against which performance is assessed.

5.252 Another problem with the use of comparators in this way, is that there may be less of an incentive for regulated firms that are leading the industry in terms of performance to outperform the benchmark, because over-performance could lead to an upward adjustment in the benchmark which would increase costs for the firm.

5.253 It could be argued that the use of comparators to underpin mechanistic performance incentive schemes based on reputation does not provide firms with strong incentives to outperform their peers, but rather to make sure that they do not fall too far behind the industry standard. A further drawback of the use of comparators in this way is that they may generate unrealistic expectations among consumers (to the extent that they pay attention to the relative ranking of firms) who may well not take into account the cost of improving performance. For instance, consumers may expect their water company to achieve the same performance as other water companies while not recognising that there are exogenous factors (e.g. regional geography or rainfall levels) which may make it costly (and perhaps uneconomic) for it to do so.

5.254 A drawback of using statistical tools to determine a benchmark is that different techniques may result in different rankings of companies and thus a different benchmark. Therefore, the incentives created by incentive schemes underpinned by the use of comparators may also differ, depending on which technique is employed.

5.255 A further disadvantage of the use of comparators to underpin performance incentive schemes, particularly with regard to an aspect such as quality of service, is that they do not necessarily provide customers with certainty regarding the performance level that must be attained.

Applicability to Ofwat

5.256 Ofwat already makes use of comparators in a variety of settings to underpin mechanistic performance incentive schemes. For example, Ofwat conducts comparative efficiency analysis to feed into efficiency incentive schemes for operating expenditure and capital expenditure; and Ofwat also makes use of comparative analysis when assessing the level of quality of service provided by water and sewerage companies.

Data issues

5.257 The data required to make use of comparisons to feed into incentive mechanisms will be dependent on what it is that Ofwat seeks to incentivise. The effort required to clean data in order for comparisons to form the basis of incentive schemes would of course depend on what the data are being used for and what is being incentivised.

5.258 New data does not necessarily have to be collected if Ofwat wishes to introduce a new incentive scheme within the price control. For example, comparative data on annual leakage performance could be used to underpin some mechanistic performance incentive scheme with regard to the level of leakage in order to achieve better security of supply. Further analysis of additional potential uses that can be made of Ofwat's current data is contained in section 6 of the report.

Potential value of comparisons

5.259 As described above, the use of comparators to underpin mechanistic performance incentive schemes are extremely useful, particularly because they allow the regulator to make use of comparative data on other firms to assess performance by each individual company, and to form a view on what expected performance levels should be across the industry.

5.260 The role played by comparators in creating incentives or feeding into incentive mechanisms is likely to alter as competition develops in the water and sewerage sector. On the one hand, in parts of the value chain where competition replaces price regulation, there may be less need to apply traditional comparative efficiency techniques. On the other hand, there may be greater scope to use comparisons to provide reputational incentives, since the scope for customers to respond to good or bad reputation (i.e. by switching to or from the supplier) will be greater. These issues are discussed in more detail below.

Impact of potential market reform

5.261 As the structure of the industry changes under the potential market reforms, the use of comparators to underpin mechanistic performance incentive schemes could still have an important role to play, to the extent that it is still necessary to provide companies with regulatory incentives.

5.262 In Ofwat's preliminary model, retail would separately contract with resources for a given quantity of water at a given price and with network plus for the treatment and transport of water and disposal of wastewater. The contractual price at which the resources business supplies water would have the incentive properties of a price cap for the initial agreed quantity of water, i.e. the resources business unit could outperform the terms of the contract by providing resources at a lower cost. Use of comparators to assess the costs of water provision and the relative efficiency of resource business units could play an important role in determining the appropriate price for water provision.

5.263 The comparison of resource business units to assess the relative efficiency of each company could feed into a specific incentive scheme if there is a global "wholesale" price control in order to put some defined incentives on the costs of resource provision. However, abstraction charges do not closely reflect the relative impact that resource use has at different times and different locations, which may create the potential for resource cost incentives to generate perverse resource use outcomes in the absence of improved abstraction cost signals. Therefore, comparisons of cost efficiency in the provision of water would have to be used carefully if they are to underpin a performance incentive scheme.

5.264 It may be easier to apply the use of comparisons to determine relative cost efficiencies for resource business units if there are separate sub price controls for resources and network plus stages of the value chain (whether these are fully separate or non-binding separate price controls used to set indicative prices), in that it may be easier to collect data specifically for resource business units.

5.265 The use of comparators to assess the relative efficiency of capital expenditure will continue to be a useful tool in respect of the RAB-based regulation of the network plus business units (whether or not the CIS continues to apply). For example, if Ofwat were to decide that a longer price-control period is more suitable for this part of the value chain, then it may be necessary to conduct efficiency assessments on a more regular basis for monitoring purposes.

5.266 Making use of comparisons to underpin a performance incentive scheme for the system operation functions may be extremely valuable; particularly at first, given that Ofwat is likely to have little idea about the relative efficiencies of the system operation functions of each network plus business.

5.267 Under Ofwat's preliminary model, network plus businesses would have an obligation to provide new connections to the network and to provide "fair, reasonable and non-discriminatory" access prices. In the event that this fosters new entry and develops competition, there may no longer be a need to incentivise opex and capex efficiency for the incumbent firms, provided that there is sufficient entry (in the contestable parts of the market) to generate the necessary competitive forces so that the market provides these incentives. However, some use of comparators could still be made in order to provide reputational incentives which are likely to become stronger as competition develops.

5.268 However, if there is not sufficient entry to provide the necessary competitive forces in the upstream stages of the value chain where entry can occur, Ofwat may need to continue to offer incentives within the price control(s). If there are different degrees of development of competition in different stages of the value chain, under separate price controls, Ofwat could use its comparisons to apply incentives with different degrees of power to reflect the extent to which different parts of the value chain need to be incentivised.

To Underpin Discretionary Performance Award Scheme

Description

5.269 Discretionary performance award schemes involve the regulator providing an increase in revenues at its discretion to recognise and reward good performance. These types of award schemes are designed to allow the regulator to reward companies that demonstrate high levels of performance in areas that cannot be easily measured or incentivised, through mechanistic performance incentive schemes and/or guaranteed standards of performance.

5.270 Discretionary award schemes can be implemented in a variety of circumstances. For example, they may be used to provide incentives to improve quality of service; to reward innovation; or to reward processes put in place by the regulated firm to achieve certain environmental objectives.

5.271 Comparisons between firms or industries can be used to determine which firms in an industry should be given a discretionary reward.

Practical examples

Ofgem: Electricity Distribution Customer Service Reward Scheme[111]

5.272 In 2006 Ofgem introduced the Electricity Distribution Customer Service Reward, a new initiative to recognise and reward distribution companies that demonstrate best practice for consumers in areas that cannot be easily measured or incentivised through more mechanistic regimes.

5.273 The scheme focuses on three broad categories:

(a) priority customer care initiatives;

(b) initiatives relating to corporate social responsibility; and

(c) wider communication strategies.

5.274 Each year, a total reward of £1 million is available across the chosen categories. Entries from distribution companies are judged by a multidisciplinary independent panel to assess which companies should be rewarded.

[111] Ofgem: Electricity Distribution Customer Service Reward Scheme
http://www.ofgem.gov.uk/Networks/ElecDist/QualofServ/CustServRewSch/Pages/CustServRewSch.aspx

Ofgem: Gas Distribution Networks Discretionary Reward Scheme[112]

5.275 The Discretionary Reward Scheme for gas distribution was introduced as a part of the Gas Distribution Price Control Review for the period 2008-2013. The aim of the discretionary reward scheme is to encourage and drive performance in areas that cannot be easily measured or incentivised through more mechanistic regimes. The scheme is designed to reward the performance of those gas distribution networks (GDNs) which best serve the interests of customers across specified categories. It is not intended as a means to fund GDN initiatives which have not yet been implemented.

5.276 The scheme has a maximum annual reward of £4 million, available across all eight GDNs, and covers three areas:

(a) initiatives which reduce the environmental impact of gas distribution, including those that reduce the gas that is consumed within or lost from a transporter's system (i.e. "shrinkage");

(b) initiatives which facilitate network extensions, particularly those that increase the affordability of network extensions for fuel-poor consumers; and

(c) schemes to promote gas safety, including awareness of the dangers of carbon monoxide.

5.277 Ofgem compares submissions from GDNs in order to assess how to allocate the funding available under the discretionary reward scheme. For each of the three areas covered by the reward scheme, Ofgem has specified a number of minimum requirements which must be met by all submissions. Only those applications that meet all of the minimum requirements are eligible for a reward. Ofgem provides GDNs with guidance on the format of the submissions.

Analysis of approach

Pros

5.278 The main advantage of using comparisons to underpin discretionary performance award schemes, is that this can encourage best practice in areas that cannot be easily measured or incentivised through specific outputs that the firms must achieve. For example, there may be advantages in using comparators in this way in areas where performance either has many dimensions or can only be assessed qualitatively.

5.279 The use of comparators in this context can also help to encourage firms to compete against one another along the dimensions subject to the discretionary performance award

[112] Ofgem: Decision report for 2009.10 Gas Discretionary Reward Scheme
http://www.ofgem.gov.uk/Pages/MoreInformation.aspx?docid=250&refer=Networks/GasDistr/QoS

scheme. In addition, if the comparisons (or the applications from firms for discretionary funding) are published by the regulator, the use of comparators to underpin discretionary performance award schemes may be useful in creating reputational incentives, provided that the companies place some importance on outperforming other companies.

Cons

5.280 A drawback of these types of schemes is that there is less clarity with regard to what must be achieved by a firm in order for it to be rewarded. This may limit the incentive provided by the financial reward, as well as making it more difficult for regulators to implement this approach in a transparent way.

5.281 In the absence of minimum performance standards (particularly with regard to aspects of performance such as quality of service and environmental performance), the use of comparators to underpin discretionary performance award schemes does not provide any certainty that the desired performance standard is achieved.

Applicability to Ofwat

5.282 Ofwat does not currently have any discretionary performance award schemes in place, and therefore, does not make use of comparisons for this purpose. However, it would be possible to introduce some form of discretionary award scheme to supplement the Service Incentive Mechanism (SIM) or to provide incentives for firms to improve their environmental performance.

Data issues

5.283 The data required to make use of comparisons to feed into decisions for discretionary performance award schemes will depend on the areas in which Ofwat wishes to apply these schemes. Typically, discretionary award schemes are implemented in areas that cannot easily be measured, and therefore implementation of this approach might require collection of additional qualitative information with regard to areas such as quality of service or environmental performance.

5.284 If Ofwat were to implement discretionary performance award schemes, and wished to make use of quantitative comparisons in order to underpin the decision-making process with regard to which firms to reward, it could be possible to make use of the data that are currently collected. However, if there are already incentives in place in these areas, combining the right level of reward for the discretionary award scheme with the other incentive schemes in place could pose a challenge for Ofwat.

Potential value of comparisons

5.285 The use of comparators to underpin discretionary performance award schemes are particularly useful if the regulator wishes to encourage best practice in areas that cannot be easily measured or incentivised through specific outputs that the firms must achieve. These types of schemes allow the regulator to make use of comparative data on other

firms (including data which are qualitative rather than quantitative) to assess performance by each individual company, and to reward those companies that have performed particularly well.

5.286 The role played by comparators in discretionary performance award schemes is likely to change as competition develops in contestable parts of the water and sewerage sector. In parts of the value chain where competition develops sufficiently such that price regulation is no longer needed, it may no longer be necessary to provide incentives to improve performance. However, discretionary performance award schemes could still be employed to encourage firms to push the boundaries of best practice, particularly in areas such as environmental performance where market discipline may not be sufficient (because in a competitive market, firms are unlikely to factor the full social cost of poor environmental performance into their decisions). These issues are discussed in more detail below.

Impact of potential market reform

5.287 Discretionary award schemes are most useful in areas that cannot be easily measured, because it is more difficult to implement mechanistic performance incentive schemes in these areas. As the structure of the industry changes, the use of comparators to underpin discretionary performance award schemes could still have a role to play, to the extent that it is still necessary to provide companies with regulatory incentives to improve performance.

5.288 Discretionary performance award schemes could be used in place of mechanistic incentive schemes, or to supplement them in particular areas where it is difficult to set explicit targets. Comparisons between firms can be used to assess which firms should be rewarded. Such an approach could be adopted whether a global "wholesale" price control is in place or if separate indicative sub price limits are put in place for resources and the network plus parts of the value chain.

5.289 This may be a particularly useful transitional approach to incentivising aspects of network plus businesses' performance with regard to system operation, because in early years it may not be clear what can and cannot be measured robustly, and as such it may be difficult to define mechanistic incentive schemes. Comparisons between the system operation functions in each network plus business could inform an assessment of which firms are performing particularly well, in order to be able to incentivise effective and efficient performance.

To Allocate Funding

Description

5.290 The discussion under this heading focuses specifically on the use of comparisons to allocate funding for future programmes or projects under special funding schemes. (Discussion of the use of comparisons to allocate funding under mechanistic incentive schemes or discretionary reward schemes can be found elsewhere in the report.)

5.291 As an example, a pool of funding could be made available for the development of a new process, or for the achievement of a specific goal, and firms requesting such funding would be judged according to how well they would be able to achieve this development or goal. These schemes could be initiated by the regulator, or by other bodies such as government departments or international institutions. Schemes could provide either on-going or one-off funding.

5.292 Special funding schemes can be a means of encouraging development in areas in which companies would not usually compete, such as initiatives to improve environmental performance (as in competitive markets firms are unlikely to factor the full social cost of poor environmental performance into their decisions) or to promote ground-breaking innovation. They could be particularly relevant in regulated markets where levels of competition are relatively low, and firms would otherwise have little incentive to undertake costly changes.

5.293 Unless funding is to be allocated equally across all firms, the body responsible for allocating the funds will need to decide how much to allocate to each individual firm. Firms could be required to submit specific information relating to the funding (e.g. business plans for how they would use it), and the awarding body could compare these proposals on a range of relevant factors to ensure that the funding is allocated to the firms and projects that would make the best use of it.

5.294 Using comparisons, as opposed to an absolute standard of performance or ability, may be particularly appropriate if there is a fixed amount which needs to be allocated between the firms, or a fixed number of firms that need to be selected for funding. In these circumstances, an absolute standard may select either too few or too many projects or firms. (It should be noted, however, that even in these circumstances the awarding body might require projects to meet certain minimum standards to avoid allocating funding to inappropriate projects.)

Practical examples

Ofgem: Low Carbon Network Fund

5.295 As part of the new price control arrangements that run from 1 April 2010 to 31 March 2015, Ofgem has set up a Low Carbon Networks (LCN) Fund.[113] The Fund will allow up to £500 million support to projects sponsored by the distribution network operators (DNOs) to try out new technology, operating and commercial arrangements. The objective of the project is to help DNOs understand what they need to do to provide security of supply at value for money as Great Britain moves to a low-carbon economy.

[113] Ofgem 'LCN Fund Governance Document v.2' 4 June 2010 http://www.ofgem.gov.uk/NETWORKS/ELECDIST/LCNF/Documents1/LCN%20Fund%20Governance%20doc%20v.2_published_FINAL.pdf

5.296 Ofgem expects that the project will involve the DNOs partnering with suppliers, generators, technology providers and other parties to explore how networks can facilitate the take-up of low-carbon and energy-saving initiatives. As such, the Fund should also provide valuable learning for the wider energy industry and other parties.

5.297 Ofgem also anticipates that the projects will highlight the regulatory and legal changes that may be needed to ensure that the networks can meet the needs of users into the future, and also that these trials will help to inform the business plans that the DNOs submit to Ofgem at the time of the next price control review.

5.298 The LCN Fund consists of two tiers. DNOs will be able to use the First Tier to recover a proportion of expenditure incurred on small-scale projects, and to recover expenditure incurred to put in place the people, resources and processes to progress innovative projects. The total expenditure that a DNO can recover from the First Tier is subject to an annual limit.

5.299 The Second Tier provides total funding of up to £320 million for the five years of the DPCR5 period for a small number of significant ”flagship” projects. Ofgem will hold an annual competition for project funding and the DNOs will compete against each other for an allocation of the funds (up to £64 million in each of the five years). This funding will be recovered from all DNOs (according to their customer numbers) through their distribution use of system charges to customers, and transferred to the DNO(s) implementing the winning project(s).

5.300 Projects must first pass through an Initial Screening Process (ISP) to demonstrate that they are eligible to be considered for funding. Each DNO Group can submit up to five projects to ISP, and can then develop up to two projects which have passed through ISP into full submissions. Full submissions will be examined in detail and evaluated against a set of evaluation criteria by an independent Expert Panel. The Expert Panel will make a recommendation to the Authority (the governing body for Ofgem) on which projects should be awarded funding. The Authority will then decide which projects will be funded.

Analysis of approach

Pros

5.301 The use of comparators in allocating funding is a useful way to establish which firm(s) would make the best use of the money, particularly if the funding can only be allocated to a limited number of firms. (By contrast, using assessment criteria defined in absolute terms may mean that too many firms or projects qualify for funding.)

5.302 The use of comparators is also useful if the funding relates to an area in which it is difficult to form a view on the appropriate level at which to set the assessment criteria.

5.303 If allocative decisions are based on comparisons rather than on absolute standards, firms have an incentive to outperform their peers in putting together bids for funding rather than

simply aiming to avoid falling below a certain level of quality. By introducing an element of competition, this could potentially increase the quality of firms' bids for the funding.

5.304 By using comparative information from other firms' bids when assessing the bid of any individual company, the regulator can potentially reduce the information asymmetry it faces when assessing proposals. This will help the regulator to make an informed choice as to the best recipient of the funding.

Cons

5.305 A disadvantage with using comparators to allocate funding, particularly under special funding schemes, is that there may not be enough comparators to enable the regulator to make an informed choice. This may be particularly relevant for schemes whose aim is to encourage development in a new area.

5.306 Related to this, given that the allocation of funding can take place in recognition of a firm's ability to achieve a particular goal or development (as opposed to just rewarding past good practice) the comparators used may not accurately reflect a firm's ability to undertake action in the future.

Applicability to Ofwat

Data issues

5.307 Ofwat does not currently allocate funding on the basis of comparisons. The data required to make use of comparisons to allocate funding will depend on the area that the funding relates to and what it aims to promote. However, for bespoke funding schemes it is likely that Ofwat would have to require firms to submit proposals describing how they would use the funding and why they would be the best recipient (e.g. a beauty pageant).

5.308 Differences across companies would have to be kept in mind when making comparisons to decide how to allocate funding. Some companies may compare less favourably but underlying factors (such as size, region or geographical features) may mean that it would actually be able to use the funds more effectively than other bidders.

Value of comparisons

5.309 Using comparators to allocate funding would enable Ofwat to assess which firms would make the best use of the money, particularly in areas in which it is difficult to form a view on the appropriate level at which to set the assessment criteria. However, some minimum standards might also be required to ensure that funding was not allocated to inappropriate projects.

5.310 It may be that, with developments in climate change, more attention is paid to environmental and innovative initiatives, which may bring with it more funding to be allocated under specific schemes. Ofwat may therefore be faced with more decisions

about how to allocate funding, and the use of comparators for this purpose may become more relevant.

Impact of potential market reform

5.311 Special funding schemes involving the use of comparators could be used on a transitional basis to assist with the potential implementation of market reform – for instance, to fund pilot tests of new competitive structures or processes in particular regions of the country. For example, one could envisage, in the future, funding for a pilot scheme to set up a system operation function in a particular geographical area, with comparisons used to determine which company's area should be selected for the trial.

5.312 In the longer term, special funding schemes aimed at promoting innovation or achieving environmental objectives may continue to be relevant even once competition has developed in contestable parts of the value chain, given the existence of externalities in these areas.

5.313 The funding for such schemes could either come from central government, or from contributions made by water and sewerage companies funded either by shareholders or through price limits (or some combination of the two). Decisions about how funding is allocated need not necessarily be made by Ofwat itself — other options would include the government running such schemes, or the appointment of an independent panel to allocate funding.

To Inform Policy Development

Description

5.314 Regulators can use the results of comparative analysis to inform the development of policy. This is a flexible tool and regulators can use the results from a range of techniques and areas of comparison for this purpose.

5.315 Results can be applied in a quantitative way to inform policy development — for example, using comparative data from other markets or industries to feed into cost-benefit analyses and impact assessments. Results can also be used more qualitatively, for example, to identify possible issues that could be addressed through policy.

5.316 Comparators can be used either in the process of developing policy proposals, such as identifying impacts of similar policies in other areas, or as a means of highlighting possible issues that could, in the future, be addressed through the development of policy. Comparators can also be used *ex post* to evaluate the impact of policies once they have been implemented.

Practical examples

Ofgem: Review of retail competition

5.317 Since the introduction of competition into electricity and gas retail markets in 1999, Ofgem has monitored the development of competition through periodic, domestic-retail market reports.[114] The periodic reports undertake analysis involving comparisons of a number of indicators of the state of domestic competition, such as market shares and price offers (including comparisons across different payment methods). Comparisons are made across individual companies as well as between incumbent and non-incumbent groups. Analysis of data not involving comparators, such as overall switching rates in the market, is also undertaken.

5.318 The information gathered and analysed for the periodic reports has helped Ofgem identify areas where the transition to competition needs to be accelerated, and where investigations and/or consultations need to launched. An example here is the investigation into unfair pricing differentials that led to the consultation in 2009 on introducing relative price controls on charges to customers paying by different payment methods. The reviews also consider particular issues raised by customers (such as service quality, transfer processes and suppliers tendering for business) and whether these signify concerns about the state of competition in the market and should be addressed through future policy development.

Ofwat: Accounting separation

5.319 Ofwat collected information on accounting separation from companies for the first time in the 2010 June Return. Ofwat will use this information when developing future policy, in particular in its work on potential market reform and future price limits. Ofwat used consultants to help develop the data requirements and reporting guidance at the initiation of the project, and will continue to do so going forward.

5.320 Ofwat makes comparisons between companies to identify best practice regarding allocation methods and processes which it then shares among the companies. Unit cost comparisons are also used to inform Ofwat's view of costs across the industry (for example, retail costs per customer).

5.321 Ofwat only includes water and sewerage companies in England and Wales as comparators, relying mainly on information from companies within the water industry but also occasionally using data from other sectors such as electricity and gas. The data are not adjusted to take account of company-specific factors and the only "cleaning" that takes place is updating submissions in response to queries. As 2010 was the first year that the information was collected, there will potentially be a number of revisions to be

[114] Ofgem: Retail Competition

made to the data submitted by companies, although this task may diminish in the future as data submissions become more compliant.

5.322 Ofwat has noted that the biggest constraint in using comparators in the area of accounting separation is the lack of comparability in the data resulting from firm- or sector-specific factors. These include different accounting methodologies and the influence of geographical location. Thus the use of comparators in the area of accounting separation does not currently influence Ofwat's policy development in a significant way.

Ofwat: Development of retail market

5.323 Ofwat makes some limited use of comparators in its work to develop retail markets, notably information on the development of retail markets in other countries (Scotland) and other sectors (gas and electricity).

5.324 One stream of work is the development of a consumer-protection framework; and comparisons of the systems and processes and consumer protection measures employed in other sectors and countries may influence which methods Ofwat chooses to adopt.

5.325 Ofwat is also considering the development of market architecture and is making use of comparison costs and process from gas and electricity markets in England and Scotland.

5.326 The use of comparators in developing policy in this area is largely qualitative, although comparative information has been used to feed into figures for cost-benefit analyses undertaken by Ofwat in the development of policy. For example, Ofwat's cost-benefit analysis on accounting separation used the costs from the same exercise in Scotland.

Ofwat: Water resource development

5.327 In the context of its work on potential market reform, Ofwat has been using comparisons of company data on water resource development costs to assess whether interconnection would be beneficial. This is supported by the use of accounting-separation data across companies to investigate the size of the network- and upstream-segments of water company businesses. Ofwat has also considered information from electricity, gas, telecoms, post and rail to assess the potential impact of potential market reforms and interconnection on the water sector.

5.328 Cost data on water resource development, taken from water resource management plans (WRMPs), are assessed using simple metrics.

5.329 Information from other sectors is generally used more anecdotally to inform policy development — for example, efficiency improvements resulting from market opening in

---

http://www.ofgem.gov.uk/Markets/RetMkts/Compet/Pages/Compet.aspx

other utility sectors. Where academic papers are used as sources, Ofwat has to rely on the studies correctly using the data, and therefore is very cautious when reading results across to the water sector.

5.330 The use of comparators, particularly the WRMP data, has enabled Ofwat to set a policy agenda for interconnection and encourages companies to consider interconnections in more detail. The consideration of comparative information from other sectors has enabled Ofwat to identify other policy issues to focus on that should eventually benefit customers and the environment, such as water trading and access to incumbent networks.

Ofcom: Mobile termination rates

5.331 In 2009. Ofcom commissioned a study to investigate the relationship between the level of mobile termination rates and certain market outcomes. The particular focus was the relative performance of the Calling Party Network Pays (CPNP) and Bill and Keep (B&K) charging regimes in delivering better outcomes to consumers, particularly with regard to retail prices, usage and take-up of mobile services.

5.332 There is currently a significant debate concerning which charging regime performs better in terms of consumer outcomes. Critics of the CPNP system argue that higher mobile-termination rates raise the cost and hence prices of calls between networks, and that this acts to hold down usage. This is due to the fact that while an individual mobile subscriber decides which operator to join, under a CPNP regime that operator is able to set termination charges that are ultimately borne by customers of *other* operators who call the subscriber. In this situation of absent price controls, operators may have relatively weak incentives to set termination charges around competitive levels.

5.333 The aim of the study was to inform Ofcom in the context of the debate, and contribute to possible policy development in the regulation of mobile termination rates. The study estimated the relationship between the level of mobile termination rates and certain market outcomes (take-up, usage, and prices) using a sample of OECD and European countries in the period from 2002 to 2007. The analysis took into account trends that may have jointly affected all the countries over time, as well as regional and country specificities that are unobserved.

Analysis of approach

Pros

5.334 Comparing information across firms, sectors or countries can identify issues that the regulator may want to address through the development of policy.

5.335 The use of comparative analysis can also increase the regulator's knowledge of how a market or industry works (for example, the costs of certain processes across firms) and thus inform policy that seeks to change the current operation of the industry.

5.336 Comparative analysis can also be used by regulators to identify potential issues that could arise under a proposed policy (for example, the impact of potential market reform). This is likely to be most relevant when using comparators from different industries or countries, where policy already exists similar to the one being developed. The ways in which regulators in these other markets have dealt with/are dealing with the issues could also act as a guide to the regulator in developing its own policy.

5.337 Comparators can also be useful in populating models that assess the impact of proposed policies, such as using data from comparable sectors or countries to populate cost benefit models.

5.338 Once a policy has been implemented, comparators from other countries or sectors where there has been no similar policy change can be used to evaluate the impact that the policy is having.

5.339 In cases where the results of comparative analysis are not suitable for direct use in regulation (e.g. setting prices or costs, or underpinning incentive schemes), the information can still be used more generally to increase the regulator's knowledge in a certain area, and to inform on-going thinking on policies.

Cons

5.340 A potential disadvantage of using comparators to inform policy development, and in particular comparisons from other countries or sectors, is that sector- or region-specific factors could impair the comparability of the information. It is unlikely that these differences will be completely accounted for, and if regulators place too much reliance on the comparators the results could be misleading.

Applicability to Ofwat

Data issues

5.341 It is possible that the results from a range of comparative techniques could be used to inform policy development, and data requirements would depend on the approach taken. For example, the data required to apply regression techniques will be very different from the data required for qualitative comparisons. In all cases, however, the comparability of the information will be essential, particularly if using international comparators or those from other sectors.

5.342 The comparators that Ofwat currently uses for policy development are applied both quantitatively (e.g. comparing unit costs, or developing cost benefit models) and qualitatively (e.g. using examples of how market reform has been implemented in other countries and sectors). In many cases, the nature of the data (e.g. the comparability or level of cleaning involved) dictates how they are used, with the less-comparable data being used in a more qualitative way to inform policy.

Potential value of comparisons

5.343 Ofwat currently makes use of comparators in a number of policy areas, particularly in the area of potential market reform (such as developing retail markets, accounting separation and interconnections).

5.344 The use of comparators in developing policy has the value of providing Ofwat with examples of similar policy development in other countries or sectors from which it can draw lessons regarding costs, impacts, and potential issues that will need to be addressed within the policy.

5.345 Analysing comparative information across water firms can also enable Ofwat to better assess the need for policy change, or the potential impact of any policy development.

Impact of potential market reform

5.346 As previously mentioned, much of the use that Ofwat has made of comparators in policy development has been in the area of potential market reform. Even if such reform is implemented, Ofwat will still be able to make use of comparators in its continuing assessment and possible refinement of the reforms.

5.347 Separate consideration of different stages of the value chain could increase the role of comparators in developing policy, as the separate segments may be more comparable to other countries or sectors. For example, separating out water and sewerage retailing may make it easier to compare this part of the value chain with retailing activities in other utility markets.

5.348 In addition, if this disaggregation is accompanied by separate accounting and reporting requirements, then it may be possible to collect more accurate information for each segment. This could improve the robustness of any comparative analysis of company data and make Ofwat more confident in the results, possibly leading to greater reliance being placed on comparators in the development of policy.

5.349 If potential market reforms result in increased entry and competition in the contestable segments of the value chain, then it may be appropriate for Ofwat to alter the way in which it regulates these segments. The use of comparators, particularly from utility markets where competition is more developed, could be extremely useful in the development of Ofwat's regulatory policy and approach to setting price limits. In addition, comparisons between water and sewerage companies operating in contestable parts of the value chain (e.g. their market shares, price offers) could be useful in assessing the development of competition.

5.350 The use of comparators (including cross-country or cross-sector comparators) could also be relevant in the development of policy relating to system operation functions. As system operation will cover newly-defined activities within the network business, such as long term planning and coordination (including across company boundaries), Ofwat may wish to develop its regulation in this area incrementally, and any continuing policy

development could benefit from examples of the regulation and operation of system operators in other sectors or countries.

To Identify Best Practice for Companies

Description

5.351 Comparisons across firms can be used by regulators to identify best practice. In turn, identification of best practice may be useful for a number of purposes, such as:

(a) informing technical assumptions when setting cost allowances at price reviews;

(b) assisting in drafting or reviewing technical guidance (e.g. industry standards or codes of practice); or

(c) promoting the dissemination of best practice across the industry.

5.352 Best practice can be identified in a range of areas, such as: organisational structure and management styles, environmental performance, service quality, cost efficiency, or the use of technology and equipment. Regulators can also highlight best practice in terms of innovation or creativity.

5.353 Regulators can compare practices across domestic or international firms, within the same industry or across different industries.

5.354 There are various ways in which the regulator could seek to identify which of the practices followed by the companies represents best practice. For example, best practice could be identified on the basis of expert review, on the basis of what represents typical practice across the industry, or by comparing with other data to see which approach leads to the best outcome (e.g. in terms of lower costs or higher quality).

5.355 Regulators can carry out a review of best practice in a number of ways. Regulators can review information provided to them by companies (for example, information provided as part of the price-review process) either within a price review or as part of a separate best-practice review, or undertake specific research tasks into companies' practices. Firms can also be incentivised to share best practice themselves.

5.356 Once identified, regulators can promote the adoption of best practice among other companies, through, for example, incentive mechanisms or by adopting best practice as voluntary or mandatory industry guidance.

Practical examples

ORR: International best practice studies

5.357 As part of its 2008 Periodic Review to determine the regulated outputs and access charges for Network Rail for the five-year control period (CP4),[115] the ORR undertook an international fact-finding programme of visits to a number of railway administrations in Europe, North America and Australia.[116]

5.358 The ORR's specific aim in making the visits was to collect information to help its assessment of National Rail's expenditure plans, and to enable it to reach a robust determination of the expenditure required to maintain and renew its infrastructure assets in an efficient and economic manner that would be in accordance with best asset management practices. A number of areas were assessed, including: strategy and policy, asset life-cycle processes, delivery, technology and equipment, and people issues.

5.359 The information collected during the visits was reviewed qualitatively by a team of experts and judgements were made as to whether the international examples represented best practice, and the extent to which Network Rail's corresponding practices exceeded or fell short of them.

5.360 The ORR made a number of recommendations to Network Rail in areas where it felt that Network Rail could benefit from adopting international best practice. The ORR also used the exercise to challenge Network Rail to consider how it could improve in line with international examples.

5.361 The ORR highlighted that comparisons across countries are difficult given the range of varying underlying factors. As such, the fact-finding tour did not represent a formal benchmarking exercise, but rather provided an opportunity to identify areas of international best practice where Network Rail could either apply lessons or undertake further investigation into opportunities to improve its own business processes. The ORR highlighted that the tour gave it a considerable amount of information to use in its assessment of Network Rail's plans for CP4.

5.362 The ORR plans to build upon the initial visit programme in the future and carry out more focused investigations of issues that it has identified as being of potential value.

---

[115] Between 1 April 2009 and 31 March 2014

[116] ORR (2008) 'ORR Best Practice Study: A report on the programme of international visits carried out by ORR between July – October 2007'
http://www.rail-reg.gov.uk/upload/pdf/wbps-rail-summary-reprt2.pdf

Ofgem: Electricity Distribution Customer Service Reward Scheme

5.363 In 2006 Ofgem introduced the Electricity Distribution Customer Service Reward scheme, designed to recognise and reward distribution companies that demonstrate best practice for consumers in areas that cannot be easily measured or incentivised through more mechanistic regimes, such as innovation and creativity.

5.364 The scheme is designed to reward the performance of distribution network operators (DNOs) that exceed their licence requirements and demonstrate "a holistic approach to promoting best practice embedded in broader business processes",[117] rather than to reward one-off initiatives.

5.365 The scheme focuses on three broad categories:

(a) priority customer care initiatives;

(b) initiatives relating to corporate social responsibility; and

(c) wider communication strategies.

5.366 Each year, a total reward of £1 million is available across the chosen categories, although the full amount is not necessarily awarded. Entries from distribution companies are judged by a multidisciplinary independent panel, and DNOs are expected to meet minimum requirements specified for each category. The panel can also identify other key areas which they expect to see demonstrated in future years' schemes and applications.

5.367 The panel of judges has noted that many companies demonstrate that they have implemented best practice initiatives identified from previous years' schemes. This fulfils the overall aim of the scheme to raise levels of service through the adoption of best practice.

Ofwat: Transfer pricing

5.368 Ofwat uses the results of comparisons to identify best practice for companies in the areas of transfer pricing.

5.369 With transfer pricing, comparisons are largely based on data from other water companies, although occasionally information from other markets or sectors is also used. The comparators are used anecdotally to identify areas of best practice. Ofwat uses these areas of best practice to suggest where other companies may improve or change their

[117] Ofgem, Report on the Electricity Customer Reward Scheme 2008-09: http://www.ofgem.gov.uk/Networks/ElecDist/QualofServ/CustServRewSch/Documents1/Decision%20Report%20for%202008-09%20Electricity%20Distribution%20Customer%20Service%20Reward%20Scheme.pdf

approach. Comparisons are made, where possible, across companies of a similar size and type, as this makes any examples of best practice more relevant.

Analysis of approach

Pros

5.370 Identifying best practice for companies can be an effective way of increasing standards within an industry or promoting the achievement of specific goals. It provides companies with tangible examples of good practices that have already been carried out, and can be particularly useful in areas that cannot be easily incentivised or measured.

5.371 The advantage of using the comparisons across companies to identify best practice is that this can be a very flexible approach. Best practice can be identified in a wide range of areas, from engineering solutions to how management and staff are organised.

5.372 In addition, this type of comparison does not necessarily need to involve detailed, quantitative data in order for best practice to be identified, which may make it possible to use comparators not considered robust enough for other uses (such as setting costs directly). For example, it may also be easier to use information from other industries or other countries, provided some consideration is given to any underlying differences.

Cons

5.373 Identifying and promoting best practice among companies may not be effective if the right incentives are not in place. If companies are simply made aware of best practice and encouraged to adopt it then this may not be sufficient to change entrenched practices.

5.374 If there are substantial differences across firms then identifying best practice may not be very relevant. This may be particularly the case when using international or cross-sectoral comparators.

5.375 Finally, this use of comparators carries the danger of "micro-management" by the regulator, since it focuses on the way in which companies carry out their activities rather than the outcomes which are achieved.

Applicability to Ofwat

5.376 As described above, Ofwat uses the results of comparisons to identify best practice in the area of transfer pricing. Given the wide-ranging use of comparators by Ofwat across the regulatory framework, it would also be possible to use comparative information to identify best practice in other areas.

Data issues

5.377 The use of comparators to identify best practice could provide Ofwat with a means of raising industry standards or influencing the approaches taken by companies in areas that cannot be easily incentivised; or where the availability or quality of comparable data are

not suitable for more direct use, such as setting costs or prices. It could also enable Ofwat to make use of the data and information on comparators that it currently collects but does not use in a formal way. Where quantitative (rather than qualitative) data are being used, it would still be important to ensure that the data are consistent and comparable, otherwise comparisons to identify best practice may not be robust or meaningful.

Potential value of comparisons

5.378 The use of comparisons to identify best practice can be useful as it provides firms with examples of good practices that are achievable, and may lead to firms improving their performance; for example, improving efficiency or customer service. Establishing best practice without the use of comparators is potentially a difficult exercise for the regulator. As long as information on best practice is widely shared and the correct incentives are in place for firms to adopt best practice, the use of comparators can increase standards within an industry in a variety of areas.

5.379 Nonetheless, Ofwat will need to avoid the danger of micro-management when using comparators for this purpose. Indeed, in debates about utility regulation, "output-based regulation" is sometimes considered as an ideal to aim for, and it would appear to be a move away from this ideal for regulators to be overly drawn into identification of best practice technologies and processes.

Impact of potential market reform

5.380 In the context of potential market reform, the use of comparative information to identify best practice may be particularly relevant for the system operation functions carried out within the network plus businesses. Ofwat could make use of, for example, best practice examples from international system operators or domestic system operators in other industries.

5.381 Any entry into contestable segments of the value chain after potential reforms to the market have been implemented would increase the number of comparators. Best practice examples from new firms could be particularly relevant if these make use of new or innovative technologies or business practices. In addition, the disaggregation of the value chain may make it easier to find examples of best practice for the individual segments by focusing on a narrower range of activities (for example, retail practices could be more easily compared across different industries than across the whole value chain).

5.382 The use of comparators to identify best practice could be particularly relevant if separate sub price controls are introduced for resources and network plus, as more targeted incentives could apply to each. Ofwat could identify and promote best practice that addresses specific aspects of the different businesses, such as new ways of treating water or managing assets for network plus, or examples of cost efficiency for resources. The use of comparators would also be relevant under a global wholesale price control, although it may possibly be more difficult to encourage firms as a whole to follow best practice that is aimed at one particular aspect of the business.

5.383 Whilst establishing best practice may be useful as a transitional tool, as competition develops there may be less need for Ofwat to undertake benchmarking exercises to identify best practice because this is likely to be a source of competitive advantage, and it will be in the best interests of the firms to adopt best practice.

5.384 However, in a competitive market there may be little incentive for companies to share their best practice (for example, investment in technology to improve environmental performance, or investment in R&D) with other water companies. Attempts by Ofwat to continue to disseminate this best practice (for example, through the use of comparisons) could reduce the incentive for innovation by reducing the competitive advantage of the innovating firms.[118] If Ofwat did continue to use comparators to establish areas of best practice, it is likely that this would have to be accompanied by strong incentives for firms to innovate. That said, the negative impact of the dissemination of best practice would need to be set against the potentially stronger incentives to innovate in the first place in a competitive market.

[118] The link between competition or market power and innovation is a matter of debate within economics. For example, arguments have been made that monopolies have less incentives to commit large resources to R&D given the fact they can make profits without this, but it has also been argued that monopolies may have higher incentives to innovate in order to protect their monopoly rents.

6 REVIEW OF OFWAT'S CURRENT DATA

6.1 Ofwat currently collects a substantial amount of data in relation to different aspects of water and sewerage companies' performance although this is currently under review. In this section we provide a brief review of Ofwat's current use of the data it collects. For the purpose of this review, we have grouped the data into four main categories, namely: quality of service, security of supply and environmental performance, costs and financial performance. The categorisation proposed in this section is by no means the only one possible, but we believe that it provides a good, high-level description of the nature of the data collected by Ofwat.

6.2 In addition to this review, we also provide some high-level suggestions on possible alternative ways in which Ofwat could further exploit the data it already collects. It is important to note that these suggestions are only indications of possible ways the existing data could be used for benchmarking purposes: the benefits from their implementation might be outweighed by the costs of implementation (including the regulatory burden they may entail). In particular, it is important to consider these suggestions in the context of Ofwat's intention to take a more risk-based approach to regulatory compliance.[119]

6.3 Our recommendations on how Ofwat should use comparisons in the future are provided in Section 7.

Quality of Service

6.4 Ofwat has collected a wealth of data in its June Returns that can be used to assess the quality of service of the water and sewerage companies. Without describing the individual items collected by Ofwat, the main information that is currently available relates to levels of service indicators such as: inadequate pressure, supply interruptions, restrictions to water use, drinking water quality failing Drinking Water Inspectorate (DWI) standards, flooding from sewers, sewer-flooding incidents, water-quality standards, time to handle written complaints, ease of telephone contacts, and frequency of meter readings.

6.5 Service quality indicators were mainly used together with indicators on security of supply and environmental performance (see below) for the construction of the Overall Performance Assessment (OPA) indicators. The results of the OPA are fed into each price determination, and they are also used for monitoring firms' behaviour and to inform policy development.

6.6 In the OPA, each company is assessed in relation to each of the indicators that compose the OPA; an aggregate result is derived by simply adding up the scores for each individual

[119] Ofwat, Getting it right for customers, How can we make monopoly water and sewerage companies more accountable?, 2010 http://www.ofwat.gov.uk/publications/focusreports/prs_web_1011regcompliance.pdf

indicator and, on that basis, price limits can be differentiated, with the best performers allowed to charge slightly more and the worst performers slightly less.

6.7 The OPA system is to be replaced with the Service Incentive Mechanism (SIM) which will be an average of two indicators: a quantitative one (which will measure complaints and unwanted contacts) and a qualitative one (which will provide an assessment of the quality of service based on surveys of customers).

6.8 Indicators of quality of service are used extensively for benchmarking purposes by Ofwat. One notable feature of the use that Ofwat makes of quality of service data is that, in general, Ofwat does not allow for any difference in the environment faced by water and sewerage companies.

6.9 For example, the customer base (e.g. the extent to which the company serves household customers) and/or the network structure might be possible drivers of some aspects of both quality and reliability of service. Because Ofwat collects a significant amount of information on network structure and customers (see below), this information could be applied to ascertain, through simple regression techniques, whether some differences in quality standards can be explained by exogenous characteristics of the companies.

6.10 Quality information is typically not used when Ofwat compares the relative cost-efficiency of water and sewerage companies. However, costs and quality are jointly determined by each water company and hence they might be analysed jointly, by allowing quality considerations to play a role within the econometric cost models. This might, however, raise important but not insurmountable econometric problems. Given that quality is at least in part under a company's control, there could be a simultaneity (endogeneity) issue in the econometric models (i.e. the OLS estimation method could give biased and inconsistent estimates); however, this issue could be dealt with by estimating reduced form models or by applying instrumental variables techniques.

6.11 Given that in the water industry most value is added at the distribution stage of the value chain, the scope for large cost-savings from switching suppliers may be smaller than in other sectors, such as gas and electricity. In this context, it may be important for eligible customers to be able to assess even small differences between suppliers in order to benefit from potential market reform. It could therefore be helpful for Ofwat to publish accurate information on quality of service on a regular basis in order to allow eligible customers to compare the offers of different providers.

6.12 Such an approach may become increasingly important under potential market reform as reputational incentives become stronger in contestable parts of the value chain. Interviews with some managers of UK network industries seem to suggest that quality

failures are more important because of the reputational effects they might have, rather than the direct financial penalty incurred.[120]

Environmental Performance and Security of Supply

6.13 Ofwat also collects a lot of data that can be grouped under the broad category of security of supply and environmental performance. Examples of such data include: population with hosepipe restrictions, leakage, serviceability indicators for underground and above-ground assets, the security of supply index, the water efficiency performance, the extent of metering, and carbon-accounting data.

6.14 In general, Ofwat uses this information to monitor other outcomes – for example, serviceability indicators are used as a complement to the cost base tool for assessing the efficiency of capital expenditure. Ofwat also uses information in this category to provide comparative information to customers in order to create reputational incentives for firms to improve performance in these areas, to inform policy development and as an input into the construction of the OPA.

6.15 Some of these data, combined with others, could be used to implement further formal benchmarking work. For example, assuming that the objective of reducing leakage is a valuable policy goal, Ofwat could combine information on the actual levels of leakage and company information related to network topology, geography, age of pipelines, weather conditions and so forth to estimate econometric models of leakage. These models could be used to understand company-level differences with regard to leakage in order to avoid setting common targets for leakage reduction that might not be (economically) feasible.

6.16 The idea here is that some proportion of leakage might depend on company-specific features, and therefore it would not be efficient for all companies to have the same level of leakage. At the same time, the level of leakage will also depend on companies' activities (e.g. expenditure to maintain or renew the water mains). Taking account of exogenous factors when setting leakage targets through an econometric benchmarking exercise would ensure that targets are focused on that element of leakage which is within management control. In 2008, Ofwat and the Environment Agency carried out some research to develop a workable methodology for a frontier-based approach to leakage target-setting. A modelling framework was developed using publicly available and audited data, and a preferred model was developed. However, the robustness of the models and the modelling process was limited by the relatively small number of companies, and by the limited number of terms that could be used to explain the operational constraints and asset conditions. It was concluded that there appeared to be a number of inconsistencies

[120] Waddams Price C., Brigham B. and Fitzgerald L. (2008), "Service Quality in Regulated Network Industries", Annals of Public and Cooperative Economics, 77, 2, 197-225.

between the ranking derived from the preferred model and that which would be expected by industry experts.[121]

6.17 An alternative approach could be to set binding minimum standards for security of supply and environmental performance, based on the average industry performance. This approach is simple to implement and would not require Ofwat to set optimum standards of performance. However, while the use of binding standards based on the industry average (or higher percentiles) may be appropriate if there is evidence that the industry average represents a good level of performance, in situations where the majority of firms in the industry need to improve (as may be the case for the level of carbon emissions, for example), the use of comparative information in this way may be less useful. Further, requiring the same level of performance from all firms would not take account of exogenous differences between firms.

Costs

6.18 Ofwat currently uses cost information to undertake extensive benchmarking analysis to set cost allowances at price reviews. Cost information is combined with non-financial measures, such as water delivered, network length, number of properties, and average pumping head, in order to assess the relative efficiency of water and sewerage companies. Ofwat's econometric work focuses on the estimation of models for operating expenditure (although up until and including PR04 a set of econometric models was also estimated to assess the relative efficiency in capital maintenance). Operating expenditure in both the water and sewerage businesses is broken down into different functions (e.g. water distribution, water resources, etc.) and for each of these areas econometric models are estimated to identify the relative efficiency of the water and sewerage undertakers.[122]

6.19 An important feature of Ofwat's models is that they are cross-sectional, and therefore they do not consider the time-series information on costs, outputs and cost drivers that have been accumulated over past years. Under some conditions, this choice could be considered a sub-utilisation of relevant information. More specifically, as long as the statistical relationship between costs and cost drivers changes over time, discarding the time-series variation in the data might be correct;[123] however, if this is not the case (as some recent empirical evidence corroborated by appropriate statistical tests seems to suggest)[124] then limiting the analysis to one single year means discarding a significant amount of information.

---

121 Environment Agency & Ofwat: Leakage Target Setting – A Frontier Approach, June 2008 http://www.ofwat.gov.uk/regulating/reporting/rpt_com_leaktgtapp.pdf

122 In the case of the sewerage service, two unit cost models are considered.

123 Strictly speaking, it is the simple pooled OLS estimator that is not appropriate, because it imposes common coefficients for each regressor over the sample period. However, the data could still be pooled by allowing the coefficients of some or all cost drivers to take on different values across different sub-periods.

124 See Kumbhakar S. and Horncastle A. (2010), Improving the Econometric Precision of Regulatory Models, Journal of Regulatory Economics, 38, 144-166.

6.20 As we have already mentioned above, quality considerations could be incorporated into the econometric cost models. Moreover, the cost base analysis used to assess the efficiency of capital expenditure could take into account the information on asset conditions and serviceability. One pitfall of the previous capital maintenance econometric models was that no real output (i.e. serviceability) was specified, i.e. capital maintenance costs were regressed on a set of cost drivers; but the main cost driver, the level of serviceability, was left out of the model (probably because it is partly under the company's control). However, as we mentioned above, there are some statistical techniques to deal with this issue.

6.21 Accounting separation information may have some interesting future applications for benchmarking purposes. Thus far, accounting-separation information has been used by Ofwat to inform policy development; however, more use could potentially be made of this information as it could provide valuable inputs to benchmarking exercises in the context of potential market reform. For example, in order to allow the entrance of new operators within the current industry structure, it can be argued that Ofwat will have to develop some access-pricing formulae to replace the Costs Principle. In this case, it might be important to understand whether the costs incurred by the incumbent to provide access are efficiently incurred or not. If Ofwat wished to estimate econometric models to assist this assessment, it would need accounting-separation information on opex and capex as well as on some of the non-financial indicators mentioned above.

6.22 Further, accounting-separation information could be used during the transition to competitive markets, i.e. while some form of price regulation is still in place. During the transitional phase, benchmarking at the level of retail, distribution, water abstraction or treatment (and similarly for the sewerage service) could be used to protect consumers. Accounting separation information may also be particularly useful for benchmarking at the retail stage of the value chain. The scope for benchmarking in the retail market could be greatly enhanced by using information on individual functional areas, because retail markets in other utility sectors could be used as comparators.

6.23 In a regulatory scenario in which some parts of the value chain are partly liberalised, there might be an incentive for regulated companies to attribute more costs to those parts of their business that are still price-regulated. Ofwat could make use of cross-sectoral comparisons and/or international comparisons to learn from the experience of other regulators with regard to transfer pricing and accounting conventions, to assess whether a change in the distribution of costs should be expected.

Financial Performance

6.24 Ofwat collects, amongst other things, information on costs, revenues, debts, leverage ratios, dividend policies, capital structures, cost of debt and the weighted average cost of capital (WACC), that allow it to build a series of indicators that can be used to evaluate the financial position of water and sewerage companies. An example is the interest coverage ratios which are considered by Ofwat to assess the financeability of each company.

6.25 Although in general the benchmarking that is undertaken by Ofwat is used to inform policy development and to monitor behaviour, it is also used to set prices. The most clear example is that concerning the estimation of the WACC (which requires information on returns, gearing, cost of debt, etc.), which is an extremely important step at each price review, given the high capital intensity nature of the water industry. Here it is important to note that, by its very nature, the WACC is an industry benchmark for the costs the regulated companies have to bear to attract capital, and it therefore generates important incentives for water companies to outperform it by procuring capital at the lowest possible cost.

7 RECOMMENDATIONS FOR FUTURE COMPARISONS

Introduction

7.1 This section of the report presents some recommendations for how Ofwat might consider using comparators both now and in the future, based on the analysis in earlier sections.

7.2 The recommendations are not intended to be exhaustive (i.e. they are not intended to cover all of the ways in which Ofwat might wish to make comparisons), but rather to highlight what we consider to be the uses of comparators likely to provide the most value to Ofwat in its work.

7.3 We would emphasise that these recommendations are tentative, and further analysis of the specific costs and benefits of applying them would be needed if Ofwat were minded to implement some or all of them. In addition, the recommendations are based on our understanding of Ofwat's current thinking as to how the water and sewerage sector might develop, and hence they may need to be adapted as Ofwat's thinking continues to evolve through the Market Reform and Future Price Limits projects.[125]

7.4 While our report identifies a very large number of ways in which comparators could potentially be used, our analysis also highlights the costs associated with using comparators in terms of collecting data, cleaning it and carrying out analysis. Ofwat is currently reviewing its approach to regulatory compliance and how it can reduce regulatory burdens that are disproportionate to the benefits of the data provided.[126] In developing these recommendations, we have therefore taken into account the need for Ofwat to be selective in the use it makes of comparators, and to focus on those which are likely to provide the most value relative to the costs involved.

7.5 While some of the recommendations in this section could be carried out using data that Ofwat already collects, some of them would require additional data to be collected, perhaps as part of Ofwat's accounting separation work. At the same time, it is likely that any change in the regulatory framework would also allow Ofwat to reduce the scope of some of its existing data requests.

7.6 The most appropriate way to use comparators is likely to vary at different stages of potential market reform. We therefore discuss our recommendations under a number of headings relating to different stages of potential market reform, namely:

(a) Existing regulatory framework

---

[125] As stated at the beginning of the report, whilst Ofwat can implement some aspects of market itself by changing the way in which it regulates e.g. to encourage water trading where this is efficient, other areas of market reform, including abstraction licence reform and retail market reform, involve decisions that will need to be taken by the UK and Welsh Assembly Governments.

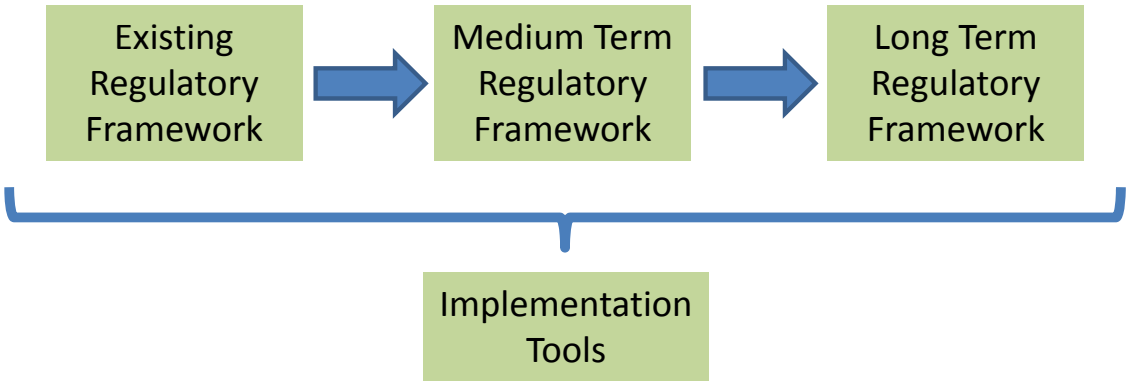
[126] Ofwat, "Getting it right for consumers"; http://www.ofwat.gov.uk/publications/focusreports/prs_web_1011regcompliance.pdf

(b) Medium-term regulatory framework

(c) Long term regulatory framework

7.7 In addition, we discuss some uses of comparators which do not relate specifically to a particular stage of potential market reform, but are instead "implementation tools" that could assist Ofwat in moving from one stage of potential market reform to the next.

7.8 These headings are summarised in the diagram below.



7.9 The remainder of this section sets out our recommendations for the use of comparators under each heading in turn. Where appropriate, we also provide brief comments on the value that the recommended comparisons will bring to Ofwat's work and whether new data would need to be collected, although more detail on these points is contained earlier in the report where the relevant approaches are analysed in detail.

Existing Regulatory Framework

7.10 Comparisons play a central role within the existing regulatory framework. The use that Ofwat has made of comparators is summarised in Section 2 of the report, and hence we do not repeat that summary here. As set out in section 1 of the report, Ofwat is currently reviewing its approach to regulation within its projects on Future Price Limits and regulatory compliance.

7.11 The extent to which it is worth Ofwat developing its use of comparators within the existing regulatory framework depends on:

(a) The anticipated length of time before potential market reform and any wider change to the regulatory framework (including any changes to approach arising from Ofwat's work on regulatory compliance) is implemented; and

(b) Whether the new or adjusted approach to using comparators that has been developed could continue to be applied once potential market reform and any wider regulatory change have been implemented.

7.12 In practice, our understanding is that Ofwat intends to use whatever regulatory framework is developed within the Future Price Limits project at the next price review. The medium term regulatory framework discussed below is based on the possible Future Price Limits preliminary model, and hence provides a starting point as to what may be appropriate at the next price review.

7.13 Clearly, if potential market reform has not been implemented by the start of the next price control period, then those parts of the recommendations below which relate to regulation of contestable markets would not be applicable at that stage. In particular, the recommendations relating to retail and resource businesses would not apply, and Ofwat would need to continue to use comparative regulation to regulate these parts of the value chain as it has in the past. However, even in this scenario, most of the recommendations relating to the network plus business units could still be implemented by Ofwat.

7.14 In the light of this, we proceed to consideration of how Ofwat might use comparators within a revised regulatory framework. The issue of how comparators can be used to inform progression towards potential market reform is covered at the end of our recommendations under "Implementation Tools".

Medium Term Regulatory Framework

7.15 For the purpose of this discussion, we define "medium term regulatory framework" to mean the framework which would apply once potential market reforms have been implemented, but before competition has developed sufficiently to allow competition to replace regulation for contestable parts of the value chain. Ofwat recognises in the preliminary model consultation that decisions around legal separation are for UK and Welsh Assembly Governments.

7.16 We assume that Ofwat's Future Price Limits preliminary model is implemented alongside potential market reform. One implication of this is that regulatory arrangements are likely to differ for different parts of the value chain. In the light of this, we consider how comparators might be used separately for each component of the preliminary model.

Retail business units

7.17 For the retail business unit, some key uses of comparators may be as follows:

(a) **Comparisons of the cost of water and sewerage retailing**, to inform the setting of default tariffs in contestable parts of the retail market and price caps in the non-contestable parts.[127]

Bearing in mind the possibility that the government might relax the merger regime for this part of the value chain, Ofwat might consider making use of any available retailing cost data from other utility sectors. Gas and electricity retailing would appear to be the most relevant comparator sector, given that they also involve the retailing of a commodity over a network and the reading of customer meters. To take this forward, Ofwat would need to liaise with Ofgem to discuss whether the required data are either already available or can feasibly be obtained.

It may also be appropriate not to use comparisons to drive efficiencies as hard as for the network plus part of the value chain, in order to leave headroom for new entrants into the contestable part of the retail market and thus encourage competition to develop more quickly. Further, given the potential role of competition in this part of the value chain, a lighter touch approach to regulatory compliance may be appropriate. Hence, our view is that detailed econometric modelling may not be appropriate for water and sewerage retailing. Instead, Ofwat might make use of simple cost comparisons (e.g. the cost of a billing system, the cost per customer of reading a meter) in order to inform a judgment regarding what cost allowances are reasonable for different elements of retailing costs.

(b) The possible use of **relative price regulation**, in a scenario in which effective competition has developed in some segments of the contestable market but not others. This would involve removing default tariffs but specifying the maximum permitted gap between the tariffs that firms charge customers in the more competitive and less competitive segments of the market. The size of the maximum permitted gap should be based on cost differentials, again assessed using simple cost comparisons such as those discussed above. This approach would allow Ofwat to roll back regulation as competition develops, while continuing to protect the most vulnerable customers in the contestable market.

(c) **Rules to ensure that firms supplying or seeking to win customers in the contestable part of the retail market provide comparable information**, to enable eligible customers to make an informed choice of supplier. At a minimum, we recommend that they should be required to provide comparable information on the tariff they are offering.

[127] In setting out our recommendations, we are using the term "contestable" to refer to those parts of water and sewerage sectors which would actually be opened to competition under potential market reform (rather than those parts of the value chain which could in theory be opened to competition).

(d) **Comparisons of the quality of service** provided to customers. These comparisons could make use of existing data collected for the Service Incentive Mechanism. However, it may not be appropriate to attach financial incentives to these comparisons in relation to customers in the contestable part of the retail market, given that the intention is for the market to provide discipline and give incentives for innovation through customer switching. The purpose of carrying out the comparisons for these customers would instead be to check that incumbent retailers with market power are not cutting back on service quality (as part of a risk-based approach to regulatory compliance), to monitor the overall impact of retail competition on customer service, and to provide reputational incentives.

(e) The above monitoring should include **comparisons between water and sewerage companies of customer complaints** relating to firm behaviour in the contestable retail market (e.g. to pick up any problems with mis-selling). This would require new procedures to collect data on customer complaints (perhaps from a relevant consumer organisation rather than companies themselves).

Network plus business units

7.18 The use of comparators for the network plus part of the value chain is likely to have most similarities with how Ofwat uses comparators within the existing regulatory framework, although there would be some important differences (e.g. comparisons of quality of service to retail customers would no longer be relevant at this level of the value chain). Some key uses of comparators for network plus businesses may be as follows:

(a) Continued **econometric comparisons of opex efficiency**. While we recognise that water and sewerage companies may have converged to the efficiency frontier over time, continued comparative efficiency analysis provides incentives for them to stay at the frontier and may stimulate continued improvements in the efficiency frontier through time. However, we consider that Ofwat's econometric analysis could be developed in a number of ways, such as making greater use of sub-company and panel data. By making better use of available data, such techniques might facilitate reform of the water merger regime by the government by reducing the number of comparators required for Ofwat's comparative efficiency analysis.[128]

(b) Continued use of **unit cost comparisons to assess the costs of capex projects**. We do not consider that comparisons of total capex are likely to be meaningful, given that the need for capex is likely to vary considerably between water and sewerage due to idiosyncratic factors (e.g. local capacity constraints requiring new investment to resolve them). Hence, we consider the need for capex projects should be assessed

[128] We understand that Ofwat has separately commissioned work on sub-company and panel data analysis, which we assume is exploring these issues in more detail.

through cost-benefit analysis, while the costing of capex projects should be assessed through unit cost comparisons.

(c) **Comparisons of TFP growth** across water and sewerage companies and across comparator sectors (including energy networks and civil engineering) to inform frontier shift assumptions, thus enabling customers to benefit from anticipated future improvements in productivity. These comparisons would require data on costs and outputs to be collected from comparator sectors during water and sewerage price reviews.

(d) **Comparisons of the quality of network services between the network plus businesses**. For example, this might involve monitoring outages on the network, whether significant, discrete investments in new infrastructure (e.g. new reservoirs, new sewage treatment plants) are provided on time, and so on. It may well be appropriate to attach financial incentives to key measures of quality. This is likely to involve the collection of new data.

(e) **Financial comparisons** at price reviews to inform Ofwat's WACC determination. This might include comparisons of equity betas, the cost of debt (including embedded debt), gearing levels, and companies' financial policies (e.g. on liquidity). Most of the data required for these comparisons is either already collected by Ofwat from water and sewerage companies or can be obtained from established sources of financial data (e.g. Bloomberg).

(f) **On-going financial comparisons** to monitor the financial robustness of companies. This would be particularly important during the implementation of market and regulatory reform and in the initial years of the new regime, given that stakeholders appear to be particularly concerned about the impact of reforms on investors. These comparisons are particularly relevant at this level of the value chain because most of the current RCV of water and sewerage companies would be allocated to the network plus businesses. For financial metrics which can be calculated using financial market data (e.g. Market to Asset Ratios for quoted companies, and bond spreads for companies with listed bonds), we suggest that Ofwat might wish to carry out internal comparisons on a regular basis (e.g. monthly or quarterly). Such metrics could be compared across water and sewerage companies and through time, as well as with comparator sectors.[129] The results could be used for internal briefing purposes, and might on occasions inform decisions by Ofwat either to refine proposals for potential market or regulatory reform to address investor concerns or to make announcements to clarify its existing stance.

[129] For instance, MARs in the water and sewerage sector could be compared with MARs for energy companies; and bond spreads in the water and sewerage sector could be compared with spreads for market indices of bonds with an investment grade credit rating.

(g) **Comparisons of the environmental performance** of network plus businesses, focusing on environmental issues relevant at this level of the value chain. This might involve a mix of quantitative comparisons (e.g. carbon emissions) and qualitative comparisons (e.g. company processes for embedding sustainability within decision-making). This would ensure that environmental externalities are not overlooked by the companies or by Ofwat. Whether or not new data were required would depend on the precise environmental comparisons that Ofwat chose to make.

System operation service

7.19 In the energy sector, system operators have often existed only at a national transmission level. Where there is only one national system operator in a given sector, the regulator's ability to use comparisons in regulating this activity may be limited (given the drawbacks of relying on international comparisons).

7.20 By contrast, the preliminary model proposed by Ofwat involves system operation being identified as a distinct set of functions within each regional network plus business, thus permitting Ofwat to make much more extensive use of comparisons in regulating this service than other regulators may have been able to do. Nonetheless, because system operation would be a newly defined set of functions, it is likely that all comparisons in this area would require the collection of new data.

7.21 Some key uses of comparators for system operation may be as follows:

(a) **Comparisons of the cost of carrying out the system operation functions**, with consideration given to both internal costs (e.g. the cost of staff, buildings and equipment) and external costs (e.g. the cost to trading with other parties to optimise network usage). This would assist Ofwat in deriving cost allowances for the system operation functions, either for inclusion within the main network plus price control or to set as a cost target within system operation incentive schemes. In early years when the drivers of system operation costs may not be understood, these comparisons might be done by comparing unit costs for different elements of system operation costs. As the drivers of these costs become better understood and more data become available through time, this could be replaced by more formal econometrics to drive efficiencies in this natural monopolistic activity (provided that the magnitude of the costs is sufficient to justify such detailed comparisons).

(b) **Qualitative comparisons of how network plus businesses carry out their system operation role** (e.g. procedures for optimisation of network usage, procedures for long-term planning and co-ordination). This could be particularly useful if, in the future, Ofwat decides that a different approach to the way this role is regulated is needed and if separation is identified as being appropriate for a future price control. Such comparisons would help spread best practice across the new system operators and enable Ofwat to identify best practice for the purpose of setting price caps.

(c) **Comparisons of the quality of "wholesale" services** provided to retail companies and the **quality of "access" services** provided to new entrants into resources and treatment services. For example, this might include the quality of information provision and responsiveness to customer queries. Initially these comparisons might be for information purposes only, but once an understanding had been established of what aspects of performance are important and what would constitute good levels of performance, it may be appropriate to attach financial incentives to these comparisons. This would help to ensure that water and sewerage companies do not reduce the costs of system operation at the expense of quality of service. Further, the provision of a good level of service quality to companies (including new entrants) operating in the contestable parts of the value chain may help to underpin the development of competition.

(d) **Comparisons of security of supply**, given the importance of security of supply and the fact that under Ofwat's preliminary model the system operation functions within network plus businesses will be responsible for long-term planning and investment coordination. It may be appropriate to attach financial incentives to these comparisons (e.g. with rewards / penalties based on the value that customers attach to security of supply).

Resources business units

7.22 The costs of the resources business units could be seen as comprising both internal costs (e.g. the cost of staff, buildings and equipment) and external costs (the price paid for abstraction rights). Ofwat's accounting separation work is considering the collection of data on the costs of the water resources activity.

7.23 **Comparisons of the internal costs of resources business** could be useful in informing the costs that should be allowed for with the price of any regulatory contract for the supply of water. Given that such regulatory contractors can be seen as a possible transitional arrangement prior to the potential development of upstream water markets, we consider that detailed econometric benchmarking is unlikely to be consistent with a risk-based approach to regulatory compliance. Instead, as with cost comparisons at the retailing level, we suggest that Ofwat employs simple cost comparisons (e.g. on a unit cost basis) to inform a regulatory judgment regarding what constitutes a reasonable cost for different elements of internal costs.

7.24 It is less clear that comparisons are useful when assessing the external costs associated with obtaining abstraction rights. This is for two reasons:

(a) First, one would expect the price of such abstraction rights on any secondary market to differ across regions, depending on the scarcity of such rights. Hence, the fact that a company in one region has to pay a higher price for such rights (if purchased on the secondary market) is not necessarily an indication of inefficiency.

(b) Second, giving firms strong incentives to reduce such costs may lead to inefficient outcomes given that the administered price that the Environment Agency charges for

abstraction rights does not currently reflect environmental impacts. A competitive secondary market for abstraction markets does not necessarily solve this problem. For example, if there is a plentiful supply of abstraction rights in a particular area due to historical over-issuance of such rights, the market price for these rights may be low even though there might be significant environmental costs associated with over-abstraction. Hence, there is a danger that strongly incentivising reductions in such costs could lead to perverse outcomes because environmental outcomes are not factored into market prices.

7.25 In theory, **comparisons of regional prices for water** may be useful, if regional upstream markets for raw water develop. New pricing data would need to be collected, probably from the market operator or a price reporting agency rather than the companies involved in trading. These prices could be analysed alongside interconnection and bulk supply activities by companies, to see whether the market was responding to price signals in the way that might be expected. If the market were not responding as expected, Ofwat might wish to investigate whether there was some barrier preventing firms responding to regional price differentials. Again, however, Ofwat would need to be aware of the potential for perverse outcomes due to the fact that environmental impacts are not reflected in abstraction prices.

7.26 **Comparisons of the environmental impact of abstraction** could play an important role in monitoring the resources part of the value chain. This area of regulation falls within the Environment Agency's remit rather than Ofwat's, and hence any decision on the use of comparators for this purpose would ultimately lie with the Environment Agency. Any such comparisons would need to be interpreted with caution since environmental impacts are always likely to differ by area (e.g. they may be intrinsically greater in parts of the country where water is scarcer). However, such comparisons could be useful in identifying whether upstream resources competition is having perverse impacts on the environment due to the lack of an abstraction pricing regime which reflects environmental costs (e.g. by encouraging firms to increase abstraction in an area where environmental costs are actually higher than elsewhere).

Long Term Regulatory Framework

7.27 For the purpose of discussion, we define the "long term regulatory framework" as the regulatory framework that would apply once competition has developed sufficiently to allow competition to replace regulation for contestable parts of the value chain.

7.28 We consider that many uses of comparators would be the same in the medium term and long term regulatory frameworks. This is likely to be particularly true for the network plus businesses.

7.29 The main area in which comparators may be used differently in the long term regulatory framework is for the retailing activity. As in other utility sectors, one can envisage the possibility that competition might develop sufficiently to allow price regulation to be removed for customers in the contestable part of the retail market. However, Ofwat would

still need to use comparators for the purpose of setting retail price caps for customers in the non-contestable part of the retail market.

7.30 Once effective competition has been established in the contestable part of the retail market, competition itself would provide incentives for firms to provide a good quality of customer service. Hence, there may be no need for the regulator to carry out such detailed comparisons of quality of service for customers in the contestable part of the retail market. More high level comparisons of quality of service may, however, still be useful as a mechanism for companies to demonstrate regulatory compliance.

7.31 Hence, the role the comparisons might play in the retail market if competition were to become established might be as follows:

(a) **Comparisons of price and quality of service**, as part of a monitoring regime to allow the regulator to intervene *ex post* if any problems were identified (perhaps using consumer protection or Competition Act powers).

(b) Similarly, **comparisons of customer complaints** relating to firm behaviour in the contestable retail market (e.g. to pick up any problems with mis-selling).

(c) **Rules to ensure that firms supplying or seeking to win customers in the contestable retail market provide comparable information** (e.g. on tariffs), to enable eligible customers to make an informed choice of supplier.

Implementation Tools

7.32 As mentioned earlier, there are some uses of comparators which do not relate specifically to a particular stage of potential market reform, but are instead "implementation tools" that could assist Ofwat in moving from one stage of potential market reform to the next. Some key uses of comparators that fall into this category are as follows:

(a) **Comparisons to assist with periodic reviews of the state of competition**, including comparisons of tariff offers and market shares. Such reviews of competition might play an important role in helping Ofwat decide when it can adopt lighter-touch forms of regulation, or remove regulation altogether, for contestable parts of the value chain. To implement these comparisons, Ofwat would need to collect additional data on tariff offers and on customer numbers. For incumbent water and sewerage companies, data on customer numbers would need to distinguish between customers in the company's "home" area (i.e. where they are the incumbent), and customers won "out of area".

(b) **Comparisons of competing bids to allocate funding for pilot schemes**. If Ofwat wished to carry out pilot schemes to test new market structures (e.g. by setting up a system operation service in a water and sewerage company in one region on a trial basis, before implementing the reform across the country), then comparisons would be important in determining which firms should carry out such pilot schemes. The

data needed for such comparisons would need to be collected through some form of bidding process.

(c) **Qualitative comparisons between water and sewerage companies to identify best practice for policy development purposes**. For example, there may be areas in which companies currently approach an activity in different ways (e.g. the methodology used for calculating certain costs) where Ofwat may wish to adopt a standardised approach for the purpose of potential market reform. Qualitative comparisons by experts might assist in identifying which approach should be adopted.

(d) **International and cross-sectoral comparisons for policy development purposes**. Ofwat may compare the way in which market reform has been implemented in different countries and sectors to inform its policy thinking on how to implement potential reform in the water and sewerage sectors in England and Wales. Data from other countries and sectors where such reforms have not been implemented could also be used as a benchmark for assessing the impact that any market and regulatory reform is having.