Additional comments on Oxera's approach to assessing the impact of the loss of Bournemouth Water on the precision of our wholesale cost models

1. Introduction

In our submission to the CMA of 10 July[1] we said that we would provide further comment on the analysis undertaken by Oxera in support of Pennon's conclusions of the impact on precision of our wholesale cost models resulting from the merger of Bournemouth Water and South West Water.

Our further comments relate to the 'specific approach', which was one of four approaches used by Oxera/Pennon to estimate the impact of the merger on precision. Oxera's approach estimates the precision in the counterfactual (ie the industry structure absent the merger of South Water Water and Bournemouth Water) and the factual (ie an industry where South West Water and Bournemouth Water have merged). Oxera's modelling approach essentially involves rerunning the models and the analysis on the select precision metrics.

As explained in our comments to Pennon's initial submission, our metric in the specific approach differs from the one used by Oxera. It also leads us to conclude that the merger will result in the loss of precision, while Pennon argue that a gain in precision arises under the specific approach, to support their argument that the merger will not affect precision in a significant way.

Our analysis that is presented below should be read alongside Section 6 of our submission to the CMA of 10 July.

[1] "Ofwat comments on Pennon Plc's initial submission to the Competition and Markets Authority (CMA)"

2. Summary - Specific approach

Using the specific approach, Oxera estimated a gain in precision resulting from the merger. Oxera's conclusion is based on estimating the confidence before the merger and after the merger for each of the five econometric models used at PR14. Oxera suggest that if the confidence interval increases, then the model becomes less precise, if it decreases – it becomes more precise. With three models exhibiting decreases and two models exhibiting increases, Oxera concludes that overall, the merger leads to more precise models.

We consider that the way in which Oxera calculates the confidence intervals and then aggregates the results leads to this questionable conclusion. We consider the underlying assumptions are not valid and consider that the approach we adopted in the initial submission is more appropriate to estimate the impact on precision. We also note that a number of other approaches to the assessment of the impact of the merger on the precision of the wholesale cost models also lead to results that show a loss in precision arising from the merger.

3. Oxera's approach

Oxera calculates 'prediction confidence intervals' (within sample), constructed as 95% confidence intervals based on the number of observations. We consider this is a valid approach.

Oxera then normalises the width of the confidence interval by the prediction in each year for each company. This gives a confidence interval for each company in each of the five models. We do not agree with Oxera's approach to normalise the confidence interval and we discuss this further in section 4 below.

Next, Oxera takes a straight average across companies and years to come to a conclusion about each model. It then averages the results across the five models to get to the total impact on the precision of the wholesale models. Oxera's results are presented in the table below.

	Pre-merger	Post-merger	Does the confidence width increase or decrease in the post-merger scenario?
WM3	3.48	3.31	Decrease
WM5	3.52	3.59	Increase
WM6	5.93	6.01	Increase
WM9	3.69	3.66	Decrease
WM10	6.48	6.40	Decrease
Totex average	4.10	4.05	Decrease
Botex average	5.09	5.03	Decrease
Total average	4.62	4.59	Decrease

4. Non-normalised approaches result in conclusions that are contrary to those set out by Oxera

Normalising by modelled costs means that confidence widths are being normalised by different denominators in the pre- and post-merger scenarios. Oxera's approach implicitly assumes that for precision to be equal pre- and post-merger, the ratio of modelled costs to confidence width must be the same. We consider this assumption is not valid. For example, in simple terms, Oxera's approach would assume that if modelled costs are zero then this ratio is undefined, implying a model with an infinitely large confidence interval is as precise as a model with an infinitely small confidence interval.

Furthermore, it may be the case that the confidence width remains the same but modelled costs change in the post-merger scenario, thus implying a different level of precision. It may be appropriate to normalise if there are large changes in modelled costs (as it indicates how important uncertainty is with respect to costs) but is misleading with marginal changes.

Therefore, we consider it is more appropriate to consider the change in the absolute width of confidence intervals. This is more comparable with the "general approach" in our initial submission where we compared the percentage increase in mean deviation. The table below presents the results of such an approach. As shown, four

of the five models show increases in the confidence interval, and thus loss of precision.

	Pre-merger	Post-merger	Does the CW increase/decrease in the post-merger scenario?
WM3	0.158	0.155	Decrease
WM5	0.158	0.167	Increase
WM6	0.259	0.271	Increase
WM9	0.158	0.162	Increase
WM10	0.269	0.271	Increase
Totex average[2]	0.183	0.187	Increase
Botex average[3]	0.213	0.217	Increase
Total average[4]	0.193	0.197	Increase

Note: confidence widths presented in log terms, not normalised.

5. Weightings applied to the observations

Oxera's approach takes the average of the normalised confidence across all companies and years and applies equal weight to each company's observation in the wholesale cost model.[5] We consider that Oxera's approach is valid, however, we consider our approach to be more appropriate, as an approach which applies equal weight to each observation (i.e. company) will likely misrepresent the impact of the predictions of some companies and the industry as a whole. For example, precision around the estimate of a smaller company will have a smaller effect on the overall industry allowance than precision around the estimate of a larger company. This is a key difference between the way Oxera estimates a proxy of the impact (essentially

[2] Weighted average of three totex models (W3, W5, W6).
[3] Average of two botex models (W9, W10)
[4] Weighted average as per triangulation.
[5] We note that taking Oxera's approach but comparing confidence intervals around the five-year rather than the one-year predictions does not change the conclusions in a material way.

average company impact) and the way we estimated it in our specific approach (essentially the overall industry impact via the upper quartile). As we are concerned with the impact on the industry, we consider it is more appropriate to look at an approach that estimates a total rather than an average impact.

6. Oxera make no attempt to decompose the impact between precision and coefficients

Oxera do not attempt to decompose the changes in confidence intervals into changes in relative efficiency and precision. This is an important consideration, as noted by Competition Commission in the South Staffordshire Water and Cambridge Water merger.[6] It is also a step we have attempted in our analysis.

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[6] Page E-9.