PENNON
GROUP PLC

Comments on Ofwat's Initial Submission to the Competition and Markets Authority

from Pennon Group Plc
July 2015

CONTENTS

1. OVERVIEW OF SUBMISSION

1.1 This document is a response to Ofwat's Initial Submission of 26 June 2015, which has arisen as a result of the acquisition of Bournemouth Water Investment Limited (BWIL) and its subsidiaries including Bournemouth Water Limited (BW) (a water company) by Pennon Group Plc (Pennon) which completed on 15 April 2015. The information provided is supplemental to the initial factual information response submitted to the CMA on 15 June 2015, the initial Phase II submission of 22 June 2015, the detailed questionnaire of 6 July 2015, and the Phase I submission dated 18 May 2015.

1.2 The acquisition and connected activities have been given the code name "Project Bronze" by Pennon, and BW may be referred to as "Bronze" in some documents.

1.3 As with other documents already submitted to the CMA, this document has been prepared by Pennon.

1.4 The contents of this submission and associated appendices are confidential to Pennon, but, in principle Pennon consent to the CMA sharing with Ofwat information and documents provided by Pennon with respect to this submission (subject to appropriate authorisation).

2. EXECUTIVE SUMMARY

2.1 At an overall level Pennon is pleased that Ofwat is not opposed to this merger.

2.2 Pennon believes that there are no points raised in the Ofwat Initial Submission that are not considered within the Pennon Initial Submission submitted on 22 June 2015.

2.3 Pennon maintains the position that there is no prejudice or detriment to Ofwat from the proposed merger of SWW and BW and it should be cleared unconditionally.

2.4 Pennon is confident the regulatory regime will benefit from the merger. Based on Oxera's calculations, the **merger is likely to give rise to a total net benefit of approximately £43m - £50m** as a result of:

- **the creation of a better wholesale cost comparator** which is more likely to be available and provide more efficiency challenge benchmark for the industry as a whole; and
- **improving the industry benchmark on retail costs**, which will provide a more challenging efficiency benchmark for the industry as a whole.

2.5 Through various documents submitted previously, Pennon has provided sufficient evidence to provide Ofwat reassurance that sufficient benefits will arise to customers and there is no prejudice to their ability to make comparisons.

2.6 Pennon will continue to work constructively with Ofwat on any specific areas of detail (such as licence reform and the approach to setting wholesale cost benchmarks at the next price review) in order to finalise the approach in these areas.

Comparison

2.7 An overall comparison of the different assessments of potential areas of detriment are is provided below:

	South West Water		Ofwat	
	Lower bound	Upper bound	Lower bound	Upper bound
SIM	£0m	£1m-£4m	£10m	£10m
Wholesale benchmark	(£27m)	(£30m)	£1m	£43m
ODIs		£0m	£8m	£66m
Loss of precision	n.a.	n.a.	0.21%[1]	3.8%[1]
Household retail		(£21m)	(£6m)	£0m
Qualitative assessment	n.a.	n.a.		Additional detriment
Total		(£43m)-(£50m)[2]	£13m	£119m

2.8 The main areas of technical difference in the Initial Submissions are summarised below:

- **synergies** – Ofwat do not take any account of the impact of synergy savings on wider industry benchmarks. Although Ofwat raise this issue when considering their initial view of remedies, Ofwat should assess the scale of this benefit whilst considering the impact on wholesale benchmarks, for example. Ofwat state that they do not take account of likely synergy benefits given the absence of a public commitment or undertaking. The question for the CMA is whether it believes that the synergy benefits as outlined by Pennon are likely to result from the merger and are merger-specific. To the extent it believes they are, then it follows that they should be taken account of in the modelling in determining whether the merger is likely to result in comparative prejudice. The question of a 'public commitment or undertaking' is not relevant in this respect'. Oxera's modelling took this into account based on only 25% of the synergy savings being delivered in terms of the likely benefit this brings in creating a better wholesale benchmark for the rest of the industry and demonstrated a net benefit from the merger on customers in England and Wales in any scenario.

- **ODIs** – the value of comparators in terms of ODIs is an area where Ofwat have produced a very wide range using a new and emerging methodology, where comparison is difficult (reflecting customer specific priorities and willingness to pay) and very sensitive to the assumptions made. Pennon consider that there is no detriment with regards ODIs, as ODIs are region specific such that further comparative analysis of the two ODIs relevant in this merger will produce detriments to customers as the costs of further improvements will be greater than customers. This point was recognised in PR14 when Ofwat concluded that it would be inappropriate to include a quantitative estimate of the impact on customers, and in the more recent report by Europe Economics

- **SIM** – similarly to ODIs, the regulatory framework has moved away from explicit use of comparators. There is strong evidence that there has been (and will continue to be) significant convergence in companies' SIM scores. This will limit the usefulness of the SIM going forward. Ofwat has already acknowledged that it could draw on comparators from other sectors to assess retail service quality and, therefore, water companies have relatively less value as comparators. Furthermore, SWW and BW will maintain separate reporting throughout 2015-2020

- **precision** – Pennon do not think it is appropriate to place any detriment value on model precision given that, as Ofwat agree, there would have been no change in the models used at PR14 if this merger had existed prior to this point and thus it could continue to use the same approach at PR19. Moreover, if any impact is perceived to occur, this could easily be offset by simplifying Ofwat's models and extending their panel data set with additional years of data

- **consistency** – Ofwat's methodology considers each area of comparison individually, without directly considering whether the assumptions in one area of comparison are consistent with those made in another. Pennon think a rounded overall view on merger analysis assumptions including both potential benefits and detriments is appropriate. Examples include:

    - only considering the 'loss' of BW (retail costs and wholesale benchmark) rather than the effects of the merger relative to the counterfactual situation (ODIs and SIM)

    - where historic and forecast data is used (wholesale cost uses historic data whereas ODIs use forecast)

    - selective consideration of whether any alternative approaches could be used (e.g. assessing that external benchmarks could be used for retail household costs, where a benefit is assessed, but not for SIM, where a detriment is assessed).

2.9 All of these points are made in the context of the acquisition of BW by Pennon being a very small merger even in the context of the water industry (for instance, BW only reflecting 5% of the RCV value of SWW, which is in itself the smallest WaSC).

3. SERVICE INCENTIVE MECHANISM

PENNON INITIAL SUBMISSION

3.1 The analysis and evidence presented in the Pennon Initial Submission estimated that, **if there was a detriment, then it was no more than £1m - £4m.**

3.2 Ofwat consider that they can draw on comparators from other sectors to assess retail service quality and therefore water companies have relatively less value as comparators. Nevertheless, in the Uplift Paper Ofwat concluded that BW has benefits to customers as a SIM comparator.

3.3 With regards to the potential impact of the merger on the SIM, the quantitative analysis carried out by Oxera (see section 12 of Pennon's Initial Submission) suggests that, if there is a detriment, it is, at most, between £1m and £4m. Oxera consider these figures to be an upper bound of the likely range for the following reasons:

- there is strong evidence that there has been (and will continue to be) significant convergence in companies' SIM scores, this will limit the usefulness of the SIM going forward;
- the difference between the maximum and minimum SIM scores in the industry is forecast to fall below a single point by the start of 2020-2025;
- the analysis to quantify any detriment is very sensitive to the assumptions made. For example, assuming some service improvements are achieved through the merger significantly reduces the detriment, and for some scenarios show a net benefit;
- Ofwat has already acknowledged that it could draw on comparators from other sectors to assess retail service quality and, therefore, water companies have relatively less value as comparators; and
- furthermore, as part of the final determinations, both BW and SWW will need to maintain separate reporting of their SIM scores during 2015-2020. This should further decrease the impact of a loss comparator over 2015-2020.

OFWAT INITIAL SUBMISSION

3.4 The analysis and evidence presented in the Ofwat Initial Submission noted that BW has demonstrated upper quartile (UQ) performance in the SIM over the three years 2011/12 to 2013/14. The SIM is the comparative mechanism that is used to measure customer service experience across the sector. Ofwat assess the **detriment could amount to around £10m** by 2025.

PENNON RESPONSE AND CONCLUSION

3.5 Whether a detriment or benefit is calculated for SIM depends, in part, on the performance of the merged company. As Pennon set out in the Initial Submission this is a key imperative for the merged business which is already fully incentivised in the regulatory framework. No additional customer protection for this aspect of the merger is required.

3.6 **With regard to the potential impact of the merger on the Service Incentive Mechanism (SIM), Oxera considers** that **Ofwat's analysis significantly overstates the scale of detriment.**

3.7 Ofwat has assessed the detriment as starting from 1 April 2016, and extending over both 2015-2020 and 2020-2025. Oxera do not consider these assumptions to be appropriate, as:

- to assume that the SIM is negatively affected from the start of 2016/17 is equivalent to assuming that services will have been fully integrated by 1 April 2016, and that all comparative benefits from BW are lost;
- it will take time for operations to be fully integrated, and SWW and BW will maintain separate reporting throughout 2015-2020;
- there is strong evidence to suggest that there has been (and will continue to be) significant convergence in companies' SIM scores - to the extent that the SIM will not be a valid performance metric beyond 2020;
- Ofwat has already acknowledged that it could draw on comparators from other sectors to assess retail service quality and, therefore, water companies have relatively less value as comparators.[1]

3.8 **Adjusting Ofwat's analysis to assess the impact from the middle of 2015-2020 until the start of 2020-2025,** results **in Ofwat's estimated detriment reducing to £3.3m.** This is towards the upper end of the range forecast in the Initial Submission of £0.8m to £3.5m.

[1] Ofwat (2014), 'Final price control determination notice: policy chapter A7 – Annex 3: benefits assessment of an uplift on the cost of capital', p. 8.

3.9 Oxera consider that this range represents an upper bound of the likely impact, as:

- SWW and BW will maintain separate reporting throughout 2015-2020;
- there may be further service improvements resulting from the merger as a result of the two companies learning from each other;
- companies' relative rankings will change over time, and thus the UQ companies will change over time, whereas Ofwat assume BW will, with 100% certainty, stay in the upper quartile.

4. WHOLESALE COST BENCHMARK

PENNON INITIAL SUBMISSION

4.1 The analysis and evidence presented in the Pennon Initial Submission resulted in a range of possible outcomes from a detriment of £1m to a benefit of £46m depending on the probability of assumptions.

4.2 In PR14, Ofwat undertook a total expenditure (totex) assessment and set companies cost allowance based on an UQ efficiency challenge. The merger of SWW and BW results in 'losing' SWW and BW and the creation of the new merged company. In section 10 of Pennon's Initial Submission, Oxera examine the impact that the merger may have on Ofwat's comparative regime through the wholesale cost benchmark challenge that Ofwat will be able to set in future reviews.

4.3 The overall results of this analysis using different approaches are presented in the table below:

Approach	Impact at PR19 over 5 years	NPV impact over 30 years
Static approach	Benefit of £60m	–
Deterministic approach	–	Benefit of 46m or detriment of £1m depending on the probability assumptions. The average of these two impacts is a benefit of £23m
Dynamic approach	–	Benefit of about £30m

4.4 **This analysis suggests the merger results in a company that is likely to be a better comparator, benefiting Ofwat's comparative efficiency regime, in terms of setting a more stringent efficiency challenge on the rest of the industry.**

OFWAT INITIAL SUBMISSION

4.5 The analysis and evidence presented in the Ofwat Initial Submission noted that at PR14 BW was in the upper quartile of the 18 water companies regulated in their benchmarking assessment of wholesale costs. Ofwat assesses the **detriment could amount to £43m** by 2025.

PENNON RESPONSE AND CONCLUSION

4.6 In its Initial Submission assessing the impact of the merger between SWW and BW, Ofwat used two approaches to assess the impact on the wholesale benchmark.[2] Under its static approach, Ofwat assessed the impact of losing BW as a comparator on the PR14 UQ benchmark based on historical cost performance. Under its forward looking approach, Ofwat assessed the future impact of losing BW as a comparator using

[2] The approach is explained in detail in Appendix A3.3.3 of Ofwat (2015): 'Ofwat's initial submission to the Competition and Markets Authority following the acquisition of Bournemouth Water Investments Limited by Pennon Group plc', June.

historical and business plan forecast data. In both approaches, Ofwat's analysis[3] quantified the value of BW as a comparator in the industry. Ofwat has also stated that it would place greatest weight on the assessment of detriment that is based on the historical cost performance.[4] While Ofwat has noted that synergy savings arising from the merger could have an impact on its analysis, it has not considered them due to, in its view, 'no public commitment or undertaking'.[5]

4.7 **Oxera's assessment is that Ofwat's analysis does not consider the outcomes in the factual and counterfactual cases appropriately. It simply estimates the value of BW in the counterfactual case.**[6] Oxera's analysis in the technical annex is consistent with the CMA merger guidance and issues statement.[7,8] Oxera's approach, at a conceptual level, is also consistent, in this regard, with how Ofwat has considered the impact of this merger on SIM and ODI.[9]

4.8 In Oxera's technical annex, Oxera focused on the forecast position of companies as assessed by Ofwat at PR14, as this merger is going to affect the wholesale benchmark going forward, and companies' historical position is not relevant for forecasting their starting position at PR19. In addition, in contrast to previous water price control reviews, Ofwat assessed business plan forecast data in PR14, such that forecast efficiency scores and rankings for the companies are more readily available than in previous merger inquiries. Furthermore, Oxera's review of Ofwat's PR14 analysis indicates that one of the key drivers of BW's estimated historical frontier position is the outcome of the supply demand balance model. Over the historical period, the supply demand balance model predicts its cost as about £11m, while BW's actual costs were about £1m.[10] BW is also not projecting *any* spend in this area over the forecast period,

[3] Ofwat (2015): 'Wholesale benchmark_changes approach.xls', June. Obtained by Oxera as part of Ofwat's initial submission to the Competition and Markets Authority following the acquisition of Bournemouth Water Investments Limited by Pennon Group Plc.

[4] See p. 50 of Ofwat (2015): 'Wholesale benchmark_changes approach.xls', June. Obtained by Oxera as part of Ofwat's initial submission to the Competition and Markets Authority following the acquisition of Bournemouth Water Investments Limited by Pennon Group Plc.

[5] See p. 50 of Ofwat (2015): 'Wholesale benchmark_changes approach.xls', June. Obtained by Oxera as part of Ofwat's initial submission to the Competition and Markets Authority following the acquisition of Bournemouth Water Investments Limited by Pennon Group Plc.

[6] Ofwat has assumed that the merger between SWW and BW will result in the loss of BW as the merged company will be more like SWW due to its size and as BW is being acquired by the parent company of SWW. This is inconsistent with how Ofwat treats data on merged companies in its PR14 wholesale and retail benchmarking analysis (and in previous reviews as well) where they assume the merged company to be a 'new' observation in the sample derived using a weighted average of the merging companies irrespective of the size of the acquired company.

[7] CMA (2015): Completed acquisition by Pennon Group plc of Bournemouth Water Investments Limited: Statement of Issues, July

[8] CMA (2014): 'Mergers: Guidance on the CMA's jurisdiction and procedure', January

[9] See Appendices A6.4 and A6.5 of Ofwat (2015): 'Ofwat's initial submission to the Competition and Markets Authority following the acquisition of Bournemouth Water Investments Limited by Pennon Group plc', June.

[10] We have considered this issue in two ways: i) we have replaced BW's extremely high over-prediction in the supply–demand balance model with its actual costs and triangulated the results using Ofwat's PR14 approach—this shifts BW down from its frontier position to rank 8; ii) we have triangulated the results from Ofwat's full and refined TOTEX models alone—this shifts BW down from its frontier position to rank 6. Using either adjustment, BW's historical frontier position is shifted below the UQ of the efficiency levels (i.e. becomes non-UQ).

and thus this outcome does not appear sustainable. In addition, SWW, as part of its merger due diligence, has identified a number of cost and delivery challenges for BW over 2015-2020. For example, SWW has indicated efficiency initiative shortfalls and emerging cost risks; limited scope of energy reductions risking the delivery of FD14 allowances; additional contract expenditure above planned assumptions; over-spend at FD09 of the capital incentive scheme partly reflecting its procurement and resilience challenges; among others.[11] All of this evidence demonstrates that BW's scope for outperformance and potential for defining the UQ benchmark over the forecast period is limited without a merger. **For these reasons, Oxera consider that companies' forecast positions provide the most appropriate starting point to assess the impact of *this* merger.**

4.9 **One of the limitations with Ofwat's analysis is that it does not explicitly take account of the impact of synergy savings from this merger.** Oxera has considered some modifications to Ofwat's approach to make its analysis more merger-specific.[12] As part of the modifications, Oxera has also considered the impact of synergy savings on the benchmark. As noted in the technical annex, **the synergy savings are likely to create a better comparator than either of the merging parties, thereby setting a more challenging benchmark on the rest of the industry in the post-merger case.** As such, it is essential to take account of the impact of such synergy savings, as they could produce a benefit for Ofwat's comparative efficiency regime.

4.10 In addition, Oxera has identified a number of limitations with Ofwat's forward looking approach. For example, i) the scenarios considered are not exhaustive and have been inadequately defined; ii) only one approach to computing the probabilities of rank movements has been considered, which has its limitations; iii) the approach contains elements that are extraneous to the calculation of the value of BW; iv) the approach assumes that efficiency scores in the industry remain unchanged over 30 years; and v) the approach assigns *a priori* values for the likelihood of some scenarios.

4.11 Notwithstanding the methodological issues we have identified with its analysis, Ofwat has stated that it may not consider the synergy benefits in its analysis in the absence of a public commitment or undertaking. Oxera does not consider this reasoning to be appropriate. The key issue is to determine whether the synergy savings indicated by the Pennon Group in its business case are likely to result from the merger. To the extent that they are, then they should be taken account of in the modelling to determine whether the merger is likely to result in comparative prejudice. It is Oxera's understanding that sustainable and incremental synergy savings are very likely to occur, but at this stage their exact value is unknown. As such, Oxera has modelled

[11] Pennon Group (2015), 'OFWAT'S INITIAL SUBMISSION TO THE COMPETITION AND MARKETS AUTHORITY FOLLOWING THE ACQUISITION OF BOURNEMOUTH WATER INVESTMENTS LIMITED BY PENNON GROUP PLC: PENNON COMMENTS', July.

[12] The amendments we have considered include extending the number of scenarios to capture all potential possibilities, deriving the likelihood of the scenarios using observed frequencies using Ofwat's changes approach from the simulation model, and estimating the impact of synergy savings on the likelihood of these scenarios. Due to limitations with Ofwat's modelling architecture, these amendments would still not capture the wider benefits from synergies on the rest of the industry. However, despite this limitation, the amended Ofwat framework for the forward-looking approach suggests a potential benefit from the merger.

relatively conservative[13] synergy savings and quantified their impact on the benchmark.

4.12 Oxera's overall conclusion is that Ofwat's analysis has a number of limitations and its submission does not raise any issue that would lead us to amend the Initial Submission on this issue. As such, Oxera's conclusion, based on following a framework that is consistent with the CMA's merger guidance and issues statement is:

The SWW BW merger results in a company that is likely to be a better comparator, benefiting Ofwat's comparative **efficiency regime on the wholesale cost in terms of setting a more stringent efficiency challenge on the rest of the industry.**

4.13 In addition, in the absence of a merger, BW faces a number of challenges:

- the securitised nature of the Artesian Debt financing that amounts to c. 90% of BW debt may prevent significant growth into new market areas (there are specific covenant restrictions on new debt and new businesses)

- when combined with the risk that the Water Framework Directive might require expensive future treatment works, this may result in significant new debt financing, which may be expensive at a time when the average cost of debt for the industry as a whole is likely to continue to fall over the next few years (for instance if referenced when considering the cost of debt as Ofwat do to 10 year historic averages, with much lower current rates on corporate debt and gilts than this average).

4.14 BW has a strong track record of delivering stable serviceability and efficient services for customers. However, the recent cryptosporidium event may indicate that there are potential resilience benefits from SWW's operational approaches and expertise.

4.15 BW also faces future efficiency challenges in a totex environment, indicated by the following metrics from FD14:

	South West Water	Bournemouth Water
Water wholesale totex efficiency	91.5%	101.2%
Historic data efficiency ranking	2nd	1st
Forecast data efficiency ranking	1st	9th
Water PAYG ratio	59.2%	75%
Water RCV run off ratio	3.72%	4%

[13] We have only included 25% of expected synergy savings in the analysis. In particular, the synergy savings, in annual non-cumulative terms and in 2012/13 prices, are assumed to be around £1.24m in PR19, and around £1.57m from PR24 onwards.

4.16 BW has a higher PAYG and RCV run off rate than SWW, which for PAYG in particular indicates greater risk from general cost shocks for short term customer bills and investors. Both will benefit from reduced financial risk applying to the broader group.

Cost and delivery challenges for BW

4.17 Furthermore, Pennon has identified a number of cost efficiency and delivery challenges for BW that limits the potential benefits in the short term. Ultimately these will be resolved through the existing delivery platform used by SWW, before they become cost risks that may have affected customer bills from 2020:

- BW were above the upper quartile water wholesale cost base at FD14 by 1.2%. This risk is confirmed by efficiency initiative shortfalls and emerging cost risks that amount to c. £0.7m to £1.0m (based on 2014 delivery)

- the delivery of FD14 allowances relies on significant energy efficiency reductions, however the scope is limited by BW power prices being largely fixed until 2018 at c. 80 - 100% higher than current market rates

- additional contract expenditure, in particular in delivery of the Customer Relationship Management (CRM) system, indicate additional expenditure above planned assumptions which will need to be offset by savings in other areas.

4.18 Additional evidence on the cost challenges facing BW continuing to operate as a standalone company in the emerging market framework can be seen from the 2010-2015 legacy adjustment performance. For the Capital Incentive Scheme, BW spent 8% more than allowed at FD09, compared to 5% less for SWW. This partly reflects procurement and also resilience challenges (extra investment resulting from the cryptosporidium incident).

4.19 In addition, Oxera's review of Ofwat's PR14 indicates that one of the key drivers of BW's estimated historical frontier position is the outcome of the supply demand balance model. Over the historical period, the supply demand balance model predicts its cost as about £11m, while BW's actual costs were about £1m. BW is also not projecting any spend in this area over the forecast period, and thus this outcome does not appear sustainable. In addition, SWW, as part of its merger due diligence, has identified a number of cost and delivery challenges for BW over 2015-2020. For example, SWW has indicated efficiency initiative shortfalls and emerging cost risks; limited scope of energy reductions risking the delivery of FD14 allowances; additional contract expenditure above planned assumptions; over-spend at FD09 of the capital incentive scheme partly reflecting its procurement and resilience challenges; among others. All of this evidence demonstrates that BW's scope for outperformance and potential for defining the UQ benchmark over the forecast period is limited without a merger.

4.20 Analysis therefore confirms that:

- BW are unlikely to be a particularly significant comparator if they remain a standalone company. The forecast data is most relevant to their current and future ability to outperform industry cost targets on average

- the merger savings are plausible. Only 25% of the wholesale cost savings are required in order for the cost benchmark to demonstrate a benefit from the merger in all scenarios.

5. OUTCOME DELIVERY INCENTIVES

PENNON INITIAL SUBMISSION

5.1 The analysis and evidence presented in the Pennon Initial Submission showed that there was no detriment in respect of ODIs, PCs and service quality.

5.2 Ofwat conclude in the Uplift Paper[14] that it was not possible to make a robust quantitative estimate of the likely impact on customers associated with the loss of a comparator for each of the 'horizontal' ODIs on which the consulted in their August draft determinations, due to the significant uncertainty about use of comparators for ODIs and the absence of sufficient track record associated with the impact of ODIs. However, Ofwat stated that it did take account of ODI performance of WoCs as part of their qualitative assessment. It noted, however, that such benefits were not large enough to change its conclusions that there will not be quantifiable costs from the loss of one or more WoCs in terms of PCs and ODIs.

5.3 Furthermore, in their Uplift Paper[15], Ofwat stated: "In the absence of compelling evidence showing that WoCs inherently provide superior service quality, we conclude that it is unlikely that the level of service quality experienced by customers of WoCs would deteriorate following a merger with a WaSC. This means that there is unlikely to be a material detriment to customers in the area of service quality from the loss of one or more WoCs".

5.4 Based on the findings of its analysis (see section 13 of Pennon's Initial Submission), Oxera agrees with the view presented by Ofwat that there will not be quantifiable costs from the loss of one or more WoC in terms of PCs and ODIs. In particular:

- at has carried out effective comparisons with ten comparators for determining sewerage ODIs and PCs;
- few (only two) of the outcome areas require any comparative analysis for the setting of upper quartile targets;
- convergence implies that there is limited scope for further improvement in those few areas where comparisons were undertaken;
- it is questionable how much further improvement customers want to pay for – as the majority of ODIs are based on company-specific customer engagement, their customers have already indicated how they value service levels;
- local factors affect comparability as well as companies' ability to improve service levels. Moreover, BW may have unique factors that affect its relevance as a comparator such a highly seasonal population with a high peak average-demand ratio and around 80% of the supply to customers coming from only two water treatment works;

[14] Policy chapter A7 Annex 3

[15] Final price control determination notice: policy chapter A7 – Annex 3: benefits assessment of an uplift on the cost of capital (page 41)

- performance against ODIs / PCs for both SWW and BW will need to be reported separately in order to monitor performance against commitments at final determinations. Given that there are no plans to remove local operational staff (particularly as SWW and BW are not contiguous and a local presence is essential for the efficient running of any water company), the separate reporting of PCs over 2015-2020 by SWW and BW should provide sufficiently independent data points for comparison purposes.

5.5 Therefore, Pennon concludes that there is no net impact of the SWW and BW merger on Ofwat's ability to make comparisons between water companies.

OFWAT INITIAL SUBMISSION

5.6 The analysis and evidence presented in the Ofwat Initial Submission noted that BW demonstrated UQ performance against each of the three comparative ODIs for the water service that were applied at PR14. Ofwat consider that the loss of BW could result in us setting less stringent benchmarks in these areas. Ofwat assess the **detriment could amount to between £8m and £66m** by 2025.

PENNON RESPONSE AND CONCLUSION

5.7 In its Initial Submission,16 Ofwat has proposed a detriment resulting from the merger on its ability to set ODIs in the range of £8m to £66m.

5.8 This is a very wide range using a new and emerging methodology, where comparison is difficult (reflecting customer specific priorities and willingness to pay) and very sensitive to the assumptions made.

5.9 Pennon consider that there is no detriment with regards ODIs, as ODIs are region specific such that further comparative analysis of the two ODIs relevant in this merger will produce detriments to customers as the costs of further improvements will be greater than customers.

5.10 This point was recognised in PR14 when Ofwat concluded that it would be inappropriate to include a quantitative estimate of the impact on customers, and in the more recent report by Europe Economics.

5.11 Oxera also remains of the view that there will be no detriment to customers resulting from the merger's impact on Ofwat's ability to set ODIs, for the following reasons:

- setting such measures on a comparative basis delivers sub-optimal outcomes for customers, due to:
    - the fact that outcomes are derived by company-specific customer engagement and research on their willingness to pay. To the extent that comparative analysis delivers different outcomes to this, a comparative approach will produce sub-optimal outcomes (especially when further

[16] Ofwat (2015), 'First day submission 230615 SWT_Redacted'; and Ofwat (2015), 'ODI analysis'.

convergence has occurred such that the remaining differences may be due to legitimate regional variations). For example, if SWW had been set the upper-quartile target for drinking water contacts at PR14, this would have resulted in a net detriment to its customers, as the cost of the service improvement would have exceeded the benefit gained by its customers from the service improvement;

- comparability issues. Local factors affect comparability as well as companies' ability to improve service levels. For example, BW may have unique factors that affect its relevance as a comparator, such as a highly seasonal population with a high peak-to-average demand ratio, and around 80% of the supply to customers coming from only two water treatment works.

- at PR14, performance targets were set for the majority of performance measures without the need for industry wide comparisons;

- Ofwat has carried out effective comparisons with ten comparators for determining sewerage ODIs and PCs;

- convergence implies that there is limited scope for further improvement in those few areas where comparisons were undertaken (and it is questionable how much further improvement customers want to pay for, as the majority of ODIs are based on company specific customer engagement, and their customers have already indicated how they value service levels)

- performance against ODIs / PCs for both SWW and BW will need to be reported in order to monitor performance against commitments at the final determinations. Given that there are no plans to remove local operational staff (particularly as SWW and BW are not contiguous and a local presence is essential for the efficient running of any water company), the separate reporting of PCs over 2015-2020 by SWW and BW should provide sufficiently independent data points for comparison purposes (if comparisons are undertaken).

5.12 The potential for a large disbenefit to Ofwat for ODIs as part of this merger (as implied by Ofwat in its Initial Submission) largely relies on Ofwat continuing to undertake comparative analysis on ODIs and setting targets on this basis (despite significant convergence being likely to have occurred). In some cases this would defy economically rational behaviour as the costs of them delivering this level of performance may be less than the benefits.

5.13 Dynamism in company performance is also suggested by Europe Economics[17] in their report for Ofwat as one of the reasons why any analysis of comparator impact from ODIs should be treated with caution:

[17] Europe Economics (May 2015), Valuing the Prejudice to Ofwat's Ability to Make Comparisons

"First, prior to PR14 these outcomes were not subject to financial incentives. Consequently forecasting rankings based on changes in rankings in the past may not be reliable. This issue should be reduced with the introduction of data from AMP6. When using this approach it will be important to justify why the future rankings are plausible"

"Further, not all companies are subject to the horizontal ODIs outlined above and the basis for individual ODIs and their relative impacts on financial performance differs across companies, reflecting customer priorities for each company. This ultimately makes cross-sector comparisons difficult and reduces the potential benefits from additional comparator companies".

6. PRECISION

PENNON INITIAL SUBMISSION

6.1 The analysis and evidence presented in the Pennon Initial Submission showed that there was no detriment with regards to precision.

6.2 The loss of precision in Ofwat's cost models is a potential issue that could arise from the loss of a comparator.

6.3 Analysis conducted by Oxera (see section 9 of Pennon's Initial Submission) shows that the merger between BW and SWW has no material impact on the precision of Ofwat's cost models, such that there is no prejudicial impact on Ofwat's ability to use the UQ efficiency challenge.

6.4 Indeed, Ofwat agrees on this point. In PR14, Ofwat stated that with respect to the loss of a WoC, "the models continue to be fit for purpose to enable an UQ efficiency challenge; that is, there would be no need to set a less stringent efficiency challenge to compensate for any lack of precision in our models."[5]

6.5 Overall, the evidence indicates that there is no material impact on precision from the merger and thus there is no prejudice. That is, Ofwat can continue to use an UQ efficiency challenge, following this merger.

OFWAT INITIAL SUBMISSION

6.6 The analysis and evidence presented in the Ofwat Initial Submission showed that Ofwat's assessment of the wholesale cost models used at PR14 indicates that the loss of BW as an independent comparator would have resulted in a reduction in the precision that applies to our wholesale cost econometric models.

6.7 While it does not state the value of detriment to the loss of precision of Ofwat's wholesale cost models in monetary terms, it assesses the loss of precision to its models to be in the range 0.21% to 3.8%. Ofwat considers that this, of itself, would not have prevented it from using the wholesale water cost models at PR14. However, the loss of BW as an independent comparator introduces detriment by potentially making comparable types of model less robust in the future. This detriment is not linear and would increase in the future if subsequent mergers were to arise.

PENNON RESPONSE AND CONCLUSION

6.8 The key point remains for this merger that there would have been no change to Ofwat's use of cost models at PR14 without BW. On this basis Pennon do not believe precision is a significant issue and no detriment arises for this merger.

6.9 Ofwat's Initial Submission examining the impact of the merger between SWW and BW on the precision of Ofwat's wholesale benchmarking models[18] indicates a potential detriment between 0.21% and 3.8%. However, Ofwat has noted that this detriment, 'of itself, would not have prevented [it] from using the wholesale water cost models at PR14.'[19]

6.10 In a similar vein, Ofwat concluded in its PR14 value of comparator analysis that the loss of a WoC would not result in it setting a less stringent efficiency challenge to compensate for any lack of precision in its models.[20] In contrast, in its Initial Submission, Ofwat's concludes that there is a detriment in precision, which is not consistent with Oxera's findings. In particular, Oxera's view is that there is no material impact on precision from the merger and thus there is no prejudice.[21]

6.11 Oxera's review of Ofwat's analysis on precision has identified three key limitations, as follows.

6.12 Under the 'specific approach', **Ofwat's estimation of the precision impact is conflated with the benchmark effect. Its subsequent attempt to separate the two is ad hoc, has no statistical basis, and departs from the Competition Commission's (CC) approach to assessing this issue in previous cases.**[22] Precision is a statistical measure of uncertainty in the parameter estimates. The CC considered the impact of previous mergers on the uncertainty compared with the pre merger case. Ofwat's approaches, which quantify a detriment of between 0.21% and 3.8%, consider the impact of the merger on the UQ benchmark and model predictions, both of which are functions of the parameter estimates rather than their underlying uncertainties. However, these estimates cannot be interpreted as measures of precision.

6.13 Moreover, the impact on the UQ benchmark is examined separately when considering the impact of the merger on the wholesale cost benchmark. In its submission, Ofwat does not clearly define precision and thus what it is estimating. Appropriate measures

[18] Ofwat (2015), 'Ofwat's initial submission to the Competition and Markets Authority following the acquisition of Bournemouth Water Investments Limited by Pennon Group plc', June.
[19] Ibid., p. 4.
[20] Ofwat (2014), 'Final price control determination notice: annex 3 – benefits assessment of an uplift on the cost of capital', December, p. 8, https://www.ofwat.gov.uk/pricereview/pr14/det_pr20141212riskrewardbenefits.pdf.
[21] Oxera (2015), 'Annex B Oxera - Precision', June.
[22] See for example, Competition Commission (2007), '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, http://webarchive.nationalarchives.gov.uk/20130704020426/http://www.competition-commission.org.uk/assets/competitioncommission/docs/pdf/non-inquiry/rep_pub/reports/2007/fulltext/525.pdf; Competition Commission (2012), 'South Staffordshire plc/ Cambridge Water plc merger inquiry (CC)- Appendices and Glossary', May, available at: http://webarchive.nationalarchives.gov.uk/20140402141250/http://www.competition-commission.org.uk/assets/competitioncommission/docs/2012/south-staff-cambridge-water/final_appendices_and_glossary.pdf

of precision include those that are examined in Oxera (2015)[23] and in the academic literature[24] - for example, R^2 and confidence widths of parameters or predictions.

6.14 Moreover, the impact on the UQ benchmark is examined separately when considering the impact of the merger on the wholesale cost benchmark. In its submission, **Ofwat does not clearly define precision and thus what it is estimating**. Appropriate measures of precision include those that are examined in Oxera (2015)[25] and in the academic literature[26] – for example, R^2 and confidence widths.

6.15 **Ofwat's 'general approach' is limited and can only give a theoretical assessment of the precision impact.** The application of this approach to the PR14 model specifications is inappropriate, since it gives implausible results from an economic and operational standpoint. This is due to complexity in Ofwat's cost models (including squared terms and cross-products).

6.16 Even within Ofwat's approaches, we have identified a number of modelling errors and inconsistencies. Notably, **Ofwat's application of bootstrapping is not consistent with that considered by the CC in previous mergers**.

6.17 In the current panel framework, the improvement in the statistical precision of econometric modelling is significantly higher when compared with a cross sectional approach, such as that used in PR09. In such a framework, any impact on precision can be easily offset and improved by extending the time period modelled. Ofwat discuss possible concerns with changes in data definitions. However, it is possible to extend the water panel dataset using additional outturn data, since the 2013/14 and 2014/15 water data is already available and does not appear to present any differences in definition from that used at PR14.

6.18 A further additional mitigation strategy would be to simplify the models. For example, one of Ofwat's models, WM3, has 26 cost drivers. In contrasts, its models in PR09 generally had only one or two cost drivers. Ofwat did not discuss this possible strategy in their Initial Submission.

6.19 To this extent, Oxera view that Ofwat's counterarguments to the actions that could be taken if there was perceived to be any detriment are not justified. Oxera therefore maintain our view that **extending the time series in the cost models, or decreasing the number of cost drivers, remains an effective and feasible mitigating strategy**.

[23] See sections 4 and A4 of Oxera (2015), 'Annex B Oxera - Precision', June.
[24] See, for example, Kumbhakar, S. and Horncastle, A. (2010), 'Improving the Econometric Precision of Regulatory Models', *Journal of Regulatory Economics*, **38**:2, October. Both authors of this paper are associated with Oxera.
[25] See Oxera (2015), 'Annex B Oxera - Precision', June, sections 4 and A4.
[26] See, for example, Kumbhakar, S. and Horncastle, A. (2010), 'Improving the Econometric Precision of Regulatory Models', *Journal of Regulatory Economics*, **38**:2, October. Both authors of this paper are associated with Oxera.

6.20 In conclusion, Ofwat's analysis in its Initial Submission does not raise any issue that would lead Oxera to alter their original conclusion. Based on Oxera's assessment following the approaches considered by the CC in previous inquiries, Oxera view that **there is no material impact on precision from the merger and thus there is no prejudice.**

7. RETAIL AVERAGE COST TO SERVE

PENNON INITIAL SUBMISSION

7.1 The analysis and evidence presented in the Pennon Initial Submission showed there could be a benefit of up to £21m.

7.2 In Ofwat's Uplift Paper[27], Ofwat state "We confirm our view in the draft determinations that there is no benefit or dis-benefit from loss of WoCs to setting retail price controls." Analysis undertaken by Oxera (see section 11 of Pennon's Initial Submission) suggests there is a benefit.

7.3 In summary, Oxera's analysis indicates that the merger of SWW and BW in a more challenging benchmark that will benefit the wider comparative efficiency regime on household retail, and thereby customers. This result holds even without considering any merger-specific savings. To the extent that the expected merger synergies would be included, the comparative benefit could be yet more significant.

7.4 In terms of the immediate impact of the merger at PR19, there could be a benefit of about £17m over five years. Under a probabilistic approach, and where Ofwat's expectations for cost convergence at future reviews are considered, there could be a benefit of about £21m (30 year net present value, NPV).

OFWAT INITIAL SUBMISSION

7.5 The analysis and evidence presented in the Ofwat Initial Submission resulted in the conclusion that both SWW and BW were relatively expensive compared to the average cost to serve benchmark at PR14. The average cost to serve benchmark was part of an evolutionary approach that Ofwat expect will enable them to move to an efficient cost to serve at future price controls.

7.6 The assessment of zero detriment assumes Ofwat adopt a frontier benchmark, or an approach that uses benchmarks that are external to the water sector in the future and so assumes that neither company would inform the setting of that benchmark at that time.

7.7 The assessment of benefit of £6m is sensitive to the assumptions about the impact of convergence in company cost to serve and the adoption of an upper quartile benchmark in the future.

7.8 Ofwat considers the assessment of detriment is closer to the £0m end of the range to the extent that we might make use of external benchmarks or frontier benchmarks in the future and the possible adoption of other methods to assessing bad debt that do not involve the use of benchmarking between companies in the future.

[27] Final price control determination notice: policy chapter A7 – Annex 3: benefits assessment of an uplift on the cost of capital (page 34)

PENNON RESPONSE AND CONCLUSION

7.9 For retail benchmarks Ofwat suggest the lower end of a £0m - £6m benefit range should be used, as external or frontier benchmarks could be used. Pennon do not understand why Ofwat do not make the same assumption for SIM, given this is the service performance measure that aligns to this area of cost. In fact, it is probably more straightforward to compare service performance than costs outside the water sector. Between retail costs and SIM, Pennon does not think that Ofwat could conclude that there was an overall detriment.

7.10 In its Initial Submission assessing the impact of the merger between SWW and BW, Ofwat used two approaches to assess the impact on the retail cost to serve.[28]

7.11 Under a static approach, Ofwat has estimated a net benefit of between £5m and £21m (over five years), depending on whether benefits from the doubtful debt adjustments are considered. The corresponding estimates derived using Oxera's analysis are similar - a net benefit of between £5m and £17m (over five years), depending on whether benefits from the doubtful debt adjustments are considered.[29]

7.12 Under a forward-looking approach, with imposed convergence in cost performance and the use of an UQ benchmark, Ofwat's assessment provides a net benefit of £6m NPV over 2020-2025 (ten-year NPV). Oxera's analysis presents a benefit of about £21m NPV over 30 years (benefit of £13m over ten years).[30]

7.13 While Oxera have some reservations about Ofwat's approaches, Oxera note that **Ofwat agrees with their conclusion that the SWW BW merger will result in a benefit on retail cost to serve**.[31] In this case, the methodological differences did not result in a material difference in our conclusions. This is because, on unmetered costs, which is the more significant of the ACtS models in terms of cost base, the difference in outcomes between factual and counterfactual cases is similar to losing BW, as considered by Ofwat.

7.14 Our main reservation with Ofwat's approach is that it simply quantifies the impact of losing BW, while our approach considers the differences in the outcomes in the factual and counterfactual scenarios. To this extent, Oxera's approach is consistent with the CMA issues statement and the CMA's merger guidance.[32,33] Oxera's approach, at a

[28] See Ofwat (2015), 'Ofwat's initial submission to the Competition and Markets Authority following the acquisition of Bournemouth Water Investments Limited by Pennon Group plc', Appendix A3.4. Oxera reviewed two analysis files: a static analysis file (with bad debt) and a changes approach analysis file.
[29] See Oxera's analysis file, 'Annex D Oxera (Static Analysis)'; and Oxera (2015), 'Annex D Oxera – retail average cost to serve', June.
[30] See Oxera's analysis file, 'Annex D Oxera (Deterministic Analysis)'; and Oxera (2015), 'Annex D Oxera – retail average cost to serve', June.
[31] Only where Ofwat use the unprecedented assumption of a pure frontier benchmark does it find no benefit.
[32] Competition and Markets Authority (2015), 'Completed acquisition by Pennon Group plc of Bournemouth Water Investments Limited: Statement of Issues', July.
[33] Competition and Markets Authority (2014), 'Mergers: Guidance on the CMA's jurisdiction and procedure', January.

conceptual level, is also consistent, in this regard, with how Ofwat has considered the impact of the merger on SIM and ODI.[34]

7.15 Oxera has considered the impact of some of Ofwat's alternative assumptions in the analysis. These sensitivities result in broadly similar results to those reported in the Pennon Initial Submission. **Oxera conclude that the results are robust to Ofwat's alternative assumptions.**

7.16 Ofwat has also considered a frontier benchmark under its forward looking approach. To Oxera's knowledge, regulators typically acknowledge that the efficiency gap between a company's current cost performance and the industry best practice is only estimated, and there are limitations in assessing this gap such that it is impossible to measure with 100% accuracy (for example, due to data or measurement errors, limitations with any benchmarking approach, etc.). For this reason, Ofwat and other UK regulators have not considered a pure frontier benchmark for benchmarking purposes in the past. As such, Oxera has not considered the impact of moving to a frontier benchmark in our analysis.

[34] See Appendices A6.4 and A6.5 of Ofwat (2015): 'Ofwat's initial submission to the Competition and Markets Authority following the acquisition of Bournemouth Water Investments Limited by Pennon Group plc', June.

8. QUALITATIVE ASSESSMENT

PENNON INITIAL SUBMISSION

8.1 The analysis and evidence presented in Annex F the Pennon Initial Submission set out the qualitative assessment in the format that Europe Economics proposed in their report for Ofwat.

8.2 Ultimately the track record of SWW, illustrates the position of SWW as a useful exemplar for Ofwat across a wide range of the regulatory framework in terms of:

- enhanced status at PR14;
- customer engagement;
- tier 1 low risk classification for 2015-16 charges; and
- self-assurance categorisation in Ofwat's company monitoring framework.

OFWAT INITIAL SUBMISSION

8.3 The analysis and evidence presented in the Ofwat Initial Submission identified areas where BW has demonstrated attributes that make it a useful comparator which suggest a detriment over and above those identified on the quantitative assessment. These included the development of outcome delivery incentives in its original business plan at PR14 where it led the way in terms of the proportion of performance commitments that were subject to a financial incentive.

8.4 Despite its relatively small size, it responded positively to the challenges Ofwat put to it through the price review process. It provided good evidence in respect of its proposed spend for a new customer relationship and billing system, which helped Ofwat to challenge the requests for billing system investment from other companies. It has a conservative financing structure and importantly, it was one of only two companies to demonstrate the need for a small company uplift to its cost of capital.

PENNON RESPONSE AND CONCLUSION

8.5 Pennon do not see any benefit for the CMA in detailed challenge and comparison between the Pennon and Ofwat submissions on qualitative assessment. There are three key areas where Pennon would note a significant distinction between the Pennon and Ofwat assessment:

- Ofwat set out that BW has been a useful comparator despite its small size. Given SWW enhanced plan status at PR14 Pennon see no reason why a detriment would arise from this merger
- Ofwat state that the proposed BW spend on a new customer relationship and billing system was used to challenge the requests for system investment from other companies. However, merger due diligence identified a significant overspend by BW (c. 40%), delay on the implementation of this system (from

June 2014 to February 2015) and reduction in scope in terms of existing system integration. The merger approach to synergy savings are also necessary to recover this situation

- Ofwat also highlight the conservative financing structure of BW. As set out in our acquisition plan, this arises purely from the whole company securitisation of BW and is unlikely to be a benefit given the need for a small company premium, which this merger will return to customers as soon as practical (from 2016/17).

8.6 Within table 1 of Ofwat's qualitative analysis, there appears to be a mix up of SWW and BW with reference to the suite of ring fencing licence conditions. SWW has always been willing to adopt these conditions but the low risk equity financing model means the need has never arisen. This is not a benefit from BW having these and SWW not having these, as the Licence post merger will start from the current industry standardised model.

8.7 BW is stated by Ofwat as being leading in terms of approach to financial outcome delivery incentives. This appears to be based on merely the proportion of their ODIs which were financial. The scale and scope of financial incentives proposed by SWW was wider than BW's – it is the absence of BW explicitly presenting reputation incentives (including those that are a benefit to the regional economy, stakeholders or are incentivised elsewhere) that results in this Ofwat qualitative assessment. We find it more plausible to take into account Ofwat's own rationale from their decision to award SWW enhanced status (and not BW) at PR14:

- for SWW outcome incentives Ofwat stated that the SWW plan stood apart from other companies as it included **a "comprehensive package of outcome delivery incentives (ODIs) that represent a strong first step under the new methodology."**

- for BW Ofwat at the time of the risk based review stated for outcomes, "the '**consumer engagement and willingness to pay (WTP) information' test was assessed as more evidence required** (C). The test score and analysis of the evidence is identical for all controls. The '**performance commitment' test was assessed as more evidence required** (C)."

8.8 Ofwat raise concerns about Board leadership, transparency and governance for SWW, namely that the Chairman of SWW is the same as Pennon. At the time Ofwat confirmed this arrangement was accepted and was entirely appropriate to the nature of the Pennon Group. Similar arrangements exist for the other listed WaSCs, United Utilities and Severn Trent. Pennon believes the listed company status in itself must have value to Ofwat in terms of Board leadership and governance, especially given the positive comments about SWW Board leadership during PR14:

> **"The [SWW] Board's view that the plan is high quality was supported by evidence and data from the rest of the plan and it provided a comprehensive update on assurance when submitting its updated business plan, which included strong evidence on how the Board had been involved in addressing the company's pre-qualification actions."**

8.9 There are a large number of similar quotes by Ofwat about SWW Board leadership and Governance at PR14.

8.10 Clearly BW had a different Chairman from Sembcorp, but this is a function of financing structure and ownership and should not be considered relevant to considering detriment from this merger to Ofwat's ability to make comparisons.

8.11 Ofwat also raise a minor point in respect to casework of compensation to a landowner. This case largely recognised a SWW offer of compensation and should not have been considered "C" rather than "B" given the lack of any other cases of a strategic nature. SWW as "self assurance" status from Ofwat so it is difficult to rationalise this Ofwat assessment given that no other relevant cases and the difference in scale between SWW and BW.

9. ASSESSMENT OF BENEFITS

PENNON INITIAL SUBMISSION

9.1 The analysis and evidence presented in the Pennon Initial Submission showed that not only there are benefits to Ofwat's ability to make comparisons, but also direct benefits to the customers of SWW and BW.

9.2 The merger will give rise to significant efficiency benefits. These will be passed back to customers following delivery, in 2020-2025. Whilst there is no requirement to pass back savings as technically there is no prejudice, Pennon is proposing to reduce the allowance for financing given to BW as the rationale for this uplift (small company premium) will no longer be in place.

9.3 The reduction of corporate costs of operating two separate companies, which will be available to be shared with the combined entity's customers at the 2019 Price Review (PR19) will result in lower bills for customers.

9.4 As described in section 6 of Pennon's Initial Submission, evidence shows that the relevant customer benefits will accrue as a result of the merger, can only achieve the same quantum of benefit through a merger and are quantifiable and will be realised within a reasonable period of the merger.

9.5 No customer from either SWW or BW will be worse off from the merger – customers will only gain from the merger. Customer bills and service levels committed in the 2014 Final Determination will be delivered as a minimum.

9.6 The operational merger of SWW and BW will result in lower costs across both companies. These cost synergies can only be delivered by the merger and will be delivered over the next two to three years and focused in the following areas:

- sale of land and surplus operational properties [xxx]
- reduced overheads [xxx]
- reduced group charges [xxx]
- combined retail business [xxx]
- wholesale operational savings [xxx]
- business rates [xxx]
- procurement and contracting [xxx]
- capital expenditure efficiencies [xxx].

9.7 These synergies will be delivered across the combined SWW and BW operations and represent [xxx] of the total expenditure (totex) of both companies.

9.8 The regulatory framework in which the two companies operate means that the parties will automatically share wholesale merger synergies which will result in reduced bills for both SWW and BW customers.

9.9 Mergers of retail activities are an inherent part of the future water regulatory incentive and market regime, and synergy savings will be passed back to customers in 2020-2025 as a result of lowering the average cost to serve and revenue allowances.

9.10 The net cost reduction resulting from the merger is anticipated to lower customer bills across both areas by an average of up to [xxx] after 2020 as the reduced costs are passed back to customers. This only represents a mechanistic application of the current regulatory framework. Pennon anticipates that the wider service and market benefits will result in more dynamic impacts than this initial estimate.

9.11 The merger brings together two successful and customer oriented businesses that will provide even better customer service as a combined entity through opportunities for knowledge sharing. Both SWW (e.g. customer engagement) and BW (e.g. customer service) have achieved industry leading standards.

9.12 Whilst it is the current intention of Pennon to merge BW's licence with SWW's, there are no plans to change the BW name or remove local operational staff (particularly as SWW and BW are not contiguous and a local presence is essential for the efficient running of any water company).

9.13 The BW Customer View Group allows stakeholders and customer representatives to scrutinise performance of their local water company. As a result, BW customers will not see any deterioration in the local service they currently receive. On the contrary, the merger is likely to give rise to even higher customer service levels due to the opportunities for knowledge-sharing and greater innovation.

9.14 SWW developed WaterShare, a mechanism to share gains from company performance with customers in a transparent way. This includes aspects that are outside of formal regulatory mechanisms, with customer benefits arising through bill reductions or reinvestment agreed with an independent panel of customer and stakeholder representatives.

9.15 BW developed a similar framework, although the details were not codified in a specific way as per the SWW mechanism. Pennon is of the view that there are benefits to customers and stakeholders for BW to mirror the open and transparent principles of reporting performance in SWW's WaterShare mechanism.

9.16 Wholesale and retail tariffs will continue to be set separately during 2015-2020 for BW customers so that compliance with the 2014 Final Determination revenue controls can continue to be demonstrated. After 2020, Pennon will also offer ongoing protection to BW customers to reflect the current bill differential to SWW of at least c. 35% - 40%.

OFWAT INITIAL SUBMISSION

9.17 The analysis and evidence presented in the Ofwat Initial Submission resulted in the conclusion that Ofwat has carried out an initial quantification of the potential relevant customer benefits that may arise from this merger. It assesses the merger could deliver [xxx] of synergy savings by 2020 (in NPV terms), of which [xxx] would be passed to customers through the existing regulatory mechanisms in 2020-2025.

9.18 These benefits arise only to the customers of SWW and BW. They do not outweigh the prejudice and so in Ofwat's view, there is a need for a remedy in this instance. The assessment of prejudice is not so great as to lead Ofwat to oppose the merger and so it sets out a range of potential remedies that could apply.

PENNON RESPONSE AND CONCLUSION

9.19 Ofwat conclude that [xxx] NPV by 2020 of synergy savings would pass back to customers through normal regulatory mechanisms as a benefit. Ofwat have calculated this through their own assessment of likely synergy savings. This does not consider benefits on future cost targets for other companies (which would exist if there is a wholesale cost model detriment as Ofwat state for the merger of two efficient companies above the UQ).

9.20 SWW modelling calculates [xxx] NPV of synergy savings automatically passed back to customers based on a detailed bottom up analysis as set out in the statement of case. Therefore Ofwat appear to agree that the SWW / BW synergy savings could be expected to be plausible. The Oxera calculation of benefit takes into account the wider impact of these savings in situations where there may be a model detriment before synergies are taken into account.

9.21 Pennon note that Oxera assumed only 25% of the Pennon assessed synergy savings would create significant benefits to the comparative regime, and thus benefits to England and Wales customers. As such, significant benefits would also arise on the basis of Ofwat's assessed synergies.

9.22 This allows Pennon to maintain the view that, considering the additional benefits to the synergy savings in the acquisition plan (including establishing a separate non-household retail company, enhanced resilience, water resource trading potential and WaterShare framework), the merger should be cleared unconditionally.

10. REMEDIES

PENNON INITIAL SUBMISSION

10.1 Pennon believes the merger will not prejudice Ofwat's ability to make comparisons for regulatory purposes and consequently the question of remedies does not arise.

10.2 Pennon highlighted that the return of the small company premium would form part of our acquisition plan, although this commitment was not specifically a remedy.

10.3 Similarly, other proposals made by Pennon, the WaterShare panel, commitment to licence reform and willingness to discuss wholesale cost benchmark guarantees for 2020 also can be considered as contributions to a remedy, although we maintain there is a net benefit from the merger and no prejudice to Ofwat's ability to make comparisons in any case.

10.4 Other matters of customer protection, including maintaining existing service standards and on tariffs may also be considered remedies, even though they are presented by Pennon as independent of the assessment of detriment and prejudice.

OFWAT INITIAL SUBMISSION

10.5 The analysis and evidence presented in the Ofwat Initial Submission notes that Ofwat discusses the range of remedies that could be considered. Remedies are complicated because the net detriment that arises is to all customers in England and Wales whereas the relevant benefit is only to the customers of South West Water and Bournemouth Water.

10.6 Ofwat anticipates that the merger parties will set out the synergy savings that could arise for customers. However, remedies that comprise a price reduction would only help customers in the Bournemouth and South West Water regions; Ofwat's view is that remedies should take account of the wider detriment to customers.

10.7 Ofwat looks to Pennon to set out its view of the potential remedies that could apply. It does not, at this stage, set out a firm view of the remedy that should apply as Ofwat would expect remedies to be discussed further during the process of this investigation.

PENNON RESPONSE AND CONCLUSION

10.8 Ofwat state there are no measures such as adjusted benchmarks, modelling time series or alternative comparators that would offset the detriment (p17 of Ofwat's Initial Submission). Similarly, no alternative approaches are identified in retail (but there's an overall benefit from the merger here), or alternatives available for ODIs and SIM.

10.9 The Pennon's Initial Submission sets out a number of alternative comparators, including ones that would be enhanced from the merger including alternatives to SIM (such as a larger entity being more useful in the Institute of Customer Services service performance comparisons to other utilities).

10.10 Ofwat believe that remedies may be affected by the fact that detriment arises to all customers in England and Wales and the relevant benefit is only to customers of SWW and BW. However, the Pennon Initial Submission and Oxera modelling demonstrate that the benefits of the merger in terms of both synergy savings and other benefits (non-household retail business in particular) can arise to customers across the country.

10.11 SWW are willing to consider Licence Reform changes being developed as a template for future industry changes. This is in part inherent in the merger case (because of the creation of a separate non-household retail business as a merger commitment), but can also be considered a remedy.

10.12 The independent scrutiny that WaterShare and Customer View Group will have over SWW and BW ongoing performance (both financial cost / investment and non-financial service and stakeholder performance) means that for this merger independent data points can be kept, if that is of value to Ofwat. We consider this as a merger commitment, but it could also be considered a remedy.

10.13 SWW expects the Licence to be updated and standardised, this merger representing the first appropriate opportunity since this form of the Licence has been introduced.

10.14 Pennon agree with Ofwat that divestiture would not be proportionate even to Ofwat's estimate of merger detriment. The merger benefits would also be lost in this case from partial divestiture as there are significant synergy benefits from integration and resilience benefits to BW customers from being part of a larger group.

10.15 Pennon present a price reduction for BW customers in terms of the small company premium, from 2016/17. This will be a formal commitment and reflects the SWW approach to ground specific proposals in high quality customer research, as demonstrated with this proposal.

10.16 Given that both Pennon and Ofwat modelling shows a benefit before considering synergy savings in terms of the retail household average cost to serve, Pennon do not intend to adjust SWW bills for this in advance of the next price review. This is because the WaterShare framework already includes a comparison of actual bad debt costs to the PR14 allowances, with a net gain to customers over the framework resulting in bill reductions or additional re-investment.

10.17 This is a specific feature of the SWW plan and the commitment is already reflected in the 2014 Final Determination, along with other SWW Board commitments such as the average household bill increasing by less than RPI. It has a specific role in the new regulatory framework as it provides a balance for items that are not specifically within the Ofwat regulatory framework from the customer and stakeholder perspective. Pennon believes it is important that this is considered part of the customer protection mechanism.

ANNEXES

The following annexes are provided separately as additional supporting information for this response.

Annex A	Oxera's response to Ofwat's Initial Submission – SIM
Annex B	Oxera's response to Ofwat's Initial Submission – Wholesale cost benchmark
Annex C	Oxera's response to Ofwat's Initial Submission – ODIs
Annex D	Oxera's response to Ofwat's Initial Submission – Precision
Annex E	Oxera's response to Ofwat's Initial Submission – Retail cost to serve
Annex F	Pennon Initial Submission

Oxera response to Ofwat's initial submission on SIM

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Contents

Summary

With regard to the potential impact of the merger on the Service Incentive Mechanism (SIM), Oxera considers that Ofwat's analysis significantly overstates the scale of detriment.

Ofwat has assessed the detriment as starting from 1 April 2016, and extending over both AMP6 and AMP7. We do not consider these assumptions to be appropriate, as:

- to assume that the SIM is negatively affected from the start of 2016–17 is equivalent to assuming that services will have been fully integrated by 1 April 2016, and that all comparative benefits from SBW are lost;
- it will take time for operations to be fully integrated, and SWW and SBW will maintain separate reporting throughout AMP6;
- there is strong evidence to suggest that there has been (and will continue to be) significant convergence in companies' SIM scores—to the extent that the SIM will not be a valid performance metric beyond AMP6;
- Ofwat has already acknowledged that it could draw on comparators from other sectors to assess retail service quality and, therefore, water companies have relatively less value as comparators.[1]

Adjusting Ofwat's analysis to assess the impact from the middle of AMP6 until the start of AMP7, results in Ofwat's estimated detriment reducing to £3.3m. This is towards the upper end of the range forecast in our initial submission of £0.8m to £3.5m.

We consider that this range represents an upper bound of the likely impact, as:

- SWW and SBW will maintain separate reporting throughout AMP6;
- there may be further service improvements resulting from the merger as a result of the two companies learning from each other;
- companies' relative rankings will change over time, and thus the upper quartile companies will change over time, whereas Ofwat assume SBW will, with 100% certainty, stay in the upper quartile.

[1] Ofwat (2014), 'Final price control determination notice: policy chapter A7 – Annex 3: benefits assessment of an uplift on the cost of capital', p. 8.

1 Introduction

The SIM is a comparative performance assessment introduced in AMP5 to encourage companies to improve their customers' experience.

In its initial submission,[2] Ofwat assessed the impact of the merger on the SIM using two approaches:

- a **static approach** that re-estimates the industry total rewards and penalties in the factual case (merger with 17 companies) and the counterfactual case (pre-merger with 18 companies), using the PR14 SIM framework;
- a **forward-looking approach** that assesses the future impact of the merger. In this approach, Ofwat has assessed the impact of the merger up to 2025, as it has assumed that the SIM will be replaced after 2025.[3]

Based on its forward-looking approach, Ofwat has proposed a detriment to the SIM resulting from the merger to be around £10m by 2025.

We explain Ofwat's analysis in section 2, and then provide our critique of Ofwat's modelling in section 3.

[2] Ofwat (2015), 'Ofwat's initial submission to the Competition and Markets Authority following the acquisition of Bournemouth Water Investments Limited by Pennon Group plc', June; and Ofwat (2015), 'SIM benchmark_forward looking'.
[3] Ofwat (2015), 'Ofwat's initial submission to the Competition and Markets Authority following the acquisition of Bournemouth Water Investments Limited by Pennon Group plc', June, p. 72.

2 An overview of Ofwat's analysis

2.1 Forward-looking analysis

In the PR14 final determinations, Ofwat assessed whether to provide a company-specific uplift to the allowed cost of capital.[4]

The analysis used historical SIM data to forecast future company performance. SIM rewards and penalties are calculated with reference to how many standard deviations companies are from the industry mean. Ofwat therefore calculated the rewards/penalties that companies would receive assuming no merger, and then calculated rewards/penalties should a water-only company no longer affect the industry mean and standard deviation. This was undertaken in turn for each water-only company.

For its initial submission,[5] Ofwat has adapted the analysis it undertook as part of the final determinations. The update creates a merged entity, with weighted average performance of SWW and SBW. The analysis then compares the industry-wide SIM rewards/penalties with the merged entity (in the factual scenario) to the rewards/penalties assumed should the merger not occur (in the counterfactual scenario).

While Ofwat's previous analysis modelled the impact as beginning in the middle of AMP6, the updated analysis now has the impact beginning from the start of 2016–17.

Ofwat noted that:

> A limitation of the analysis is the assumption that on average companies' relative rankings do not change. While each company's expected score tends towards the forecast average score, their expected rankings – which we use to calculate the expected rewards and penalties – do not change. Given that the rewards and penalties depend on each company's retail household service revenue, while we assumed a constant distribution of scores, the possibility that companies' ranking might change is clearly a material factor.[6]

Ofwat has estimated a detriment of around £10m by 2025 under this approach.[7]

2.2 'Static' analysis

As well as its forward-looking analysis, Ofwat provides a 'static' analysis looking back at PR14.

The analysis estimates the impact on industry-wide rewards/penalties at PR14 assuming that, instead of SWW and SBW having separate scores, there had been a single entity with a weighted average of the two companies' scores.

Ofwat has estimated a detriment of £6m under this approach. However, given that separate datasets would have been available over the historical period, the

[4] Ofwat (2014), 'Benefits of comparators', http://www.ofwat.gov.uk/content?id=9d01e438-8542-11e4-8fe5-b9bb2e8303f4.
[5] Ofwat (2015), 'SIM benchmark_forward looking'.
[6] 'Ofwat (2015), 'Ofwat's initial submission to the Competition and Markets Authority following the acquisition of Bournemouth Water Investments Limited by Pennon Group plc', June, p. 74.
[7] Ofwat (2015), 'Ofwat's initial submission to the Competition and Markets Authority following the acquisition of Bournemouth Water Investments Limited by Pennon Group plc', June; and Ofwat (2015), 'SIM benchmark_forward looking'.

merger would not have altered the overall adjustment to the companies at PR14. Ofwat acknowledges this point in its submission.[8]

[8] Ofwat (2015), 'Ofwat's initial submission to the Competition and Markets Authority following the acquisition of Bournemouth Water Investments Limited by Pennon Group plc', June, p. 72.

3 Oxera's response to Ofwat's analysis

Below we review the two main issues we have identified with Ofwat's forward-looking analysis. We then critique the other modelling assumptions made, and the static analysis.

3.1 When should impacts be assessed from?

In the 2014 final determinations, Ofwat assessed the potential impact that a merger could have on the SIM, and concluded:

> We assumed no impact until the middle of the price review period, given that any proposed merger would take time to be decided, cleared by the Competition and Markets Authority, and then implemented.[9]

To assume that the SIM is negatively affected from the start of 2016–17 is equivalent to assuming that SWW's and SBW's operations will have been fully integrated by 1 April 2016, and that all comparative benefits from SBW would be completely lost.

As part of the final determinations, both SBW and SWW will need to maintain separate reporting of their SIM scores during AMP6. This will provide two separate data-points for Ofwat's SIM analysis. Therefore, with all else held constant, a detriment should only arise to the extent that SBW's SIM scores become lower than they would have, had the merger not occurred.

There is nothing to suggest that this will be the case. Indeed, the business case for the merger stated that one of its key benefits is expected to be an optimised customer service package from the best of both companies.[10] Therefore, it is perfectly plausible that the SWW and SBW SIM scores will be higher following the merger, thus raising the industry average SIM score, and producing net benefits to customers.

However, we recognise that having an independently managed company *may* offer some comparative benefits in this area, as an independent company may be able to innovate in different ways than if it were sharing a single management team with another comparator.

Therefore, in undertaking our analysis for the initial submission,[11] we took a *conservative* approach in order to estimate an upper bound impact of the merger in this area, and assumed that:

- SBW's performance would not improve above the pre-merger counterfactual;
- despite separate reporting, SBW would cease to provide an independent comparison during the AMP.

To reflect the fact that it would take time for operations to be fully integrated, and that SWW and SBW would maintain separate reporting throughout the AMP, we assessed that detriments resulting from the merger would begin from the middle of the price control period onwards (as per Ofwat's approach in the final determinations).

We do not consider that Ofwat's new approach, of assuming all comparative benefits of SBW are instantly lost, to be realistic. We also note that Ofwat has

[9] Ofwat (2014), 'Final price control determination notice: policy chapter A7 – Annex 3: benefits assessment of an uplift on the cost of capital', p. 35.
[10] Pennon plc (2015), 'Acquisition of Bournemouth Water – The rationale and business case', p. 5.
[11] Oxera (2015), 'Annex E Oxera – The Service Incentive Mechanism'.

provided no justification for having changed its assumption since the final determinations.

Adjusting Ofwat's analysis[12] to assess detriments from the middle of the AMP onwards reduces Ofwat's forecast impact (of £10m) by £2.5m.

3.2 When should impacts be assessed until?

In our initial submission,[13] we assessed:

- SIM convergence to date;
- Ofwat's forecast SIM convergence;
- previous convergence in service measures (the Overall Performance Assessment, OPA);
- measurement error in the SIM;
- the role of other benchmarks

We consider that there is a strong body of evidence to suggest that SIM will not be a valid performance metric beyond AMP6.

Indeed, if Ofwat were to maintain the SIM during AMP7, in all likelihood it would need to set financial incentives based on data that is not supported by the degree of measurement uncertainty present—McCallum Layton (2014) estimated that the accuracy for individual qualitative scores was +/- 3.5% for a sample size of 800.[14]

Furthermore, the data is likely to reflect performance that has a greater level of convergence than the previous OPA,[15] which was discontinued, with Ofwat stating that the bunching of companies' OPA scores suggested that the OPA would not drive further significant service improvements.[16]

Ofwat has previously noted that it could:

> draw on comparators from other sectors to assess retail service quality and therefore water companies have relatively less value as comparators.[17]

For this reason, Ofwat has also stated that the analysis it undertook as part of the final determinations would represent an 'upper limit to the benefits of comparators'.[18]

As per our initial submission, we also note that the Institute of Customer Service publishes sectoral and individual company scores for customer satisfaction using a wide range of criteria. This survey requires a suitable scale of company (for example, for comparisons to the Big Six energy suppliers for customer service), and, currently, only nine water and sewerage companies are reported in the results, including SWW. Since SWW is at the lower end of the size scale for

[12] Ofwat (2015), 'SIM benchmark_forward looking'.
[13] Oxera (2015), 'Annex E Oxera – The Service Incentive Mechanism'.
[14] McCallum Layton (2014), 'Ofwat SIM Survey 2013/14 Annual Report: Summary', p. 3, http://www.ofwat.gov.uk/regulating/aboutconsumers/sim/rpt_com201408simrptsummary.pdf.
[15] See Oxera (2015), 'Annex E Oxera – The Service Incentive Mechanism'.
[16] Ofwat (2010), 'Putting water consumers first – how can we challenge monopoly companies to improve?', p. 5.
[17] Ofwat (2014), 'Final price control determination notice: policy chapter A7 – Annex 3: benefits assessment of an uplift on the cost of capital', p. 8.
[18] Ofwat (2014), 'Final price control determination notice: policy chapter A7 – Annex 3: benefits assessment of an uplift on the cost of capital', p. 35.

companies in the survey, some of the detailed questions are not currently reported. Mergers in the water sector therefore have the potential to allow this cross-sector source of customer service comparisons to be used as an alternative to the SIM.

For the reasons stated above, we do not consider that the SIM will be a valid performance metric beyond AMP6.

Adjusting Ofwat's analysis[19] to assess detriments to exclude the impact from AMP7 performance reduces Ofwat's forecast impact (of £10m) by £4.1m.

3.3 Other modelling assumptions

As well as the time-period-related assumptions described above, there are a number of other points to note about the Ofwat analysis.

The analysis assumes that there will not be any service improvements resulting from the merger (this is not in keeping with Pennon's expectations). We consider this to be a somewhat aggressive assumption, and which should be seen very much as a conservative (and upper-bound) estimate.

Furthermore, the analysis assumes that companies' relative rankings do not change over time. Ofwat has acknowledged this point as a limitation of the analysis.[20] As SWW's and SBW's performance commitments are not materially different from the performance levels forecast by the analysis, we do not consider this simplification to fundamentally undermine the analysis. However, by retaining existing rankings, the analysis is effectively assuming that the loss of SBW as a comparator is undoubtedly equivalent to losing a good comparator. This is a strong assumption to make,[21] although it may be appropriate as an upper-bound estimate.

For this reason, it should also be considered that the figure of £3.3m is an upper-bound estimate (this is the figure obtained from making the adjustments set out in sections 3.1 and 3.2).

3.4 Ofwat's static analysis

We do not consider that using a static analysis to estimate the impact of the detriment is appropriate, as we do not consider that it is reasonable to assume a wholly static weighted approach to service levels.

Ofwat acknowledges that:

> …to the extent that separate datasets would have been available for historic [sic] performance this would not have altered the overall adjustment we would have made for the SIM at PR14.[22]

Moreover, in estimating the effect of the merger going forward, the static approach does not take account of any future degree of convergence. For the reasons set out above, we consider that there is strong evidence for convergence. Indeed, Ofwat's own modelling shows a high degree of

[19] Ofwat (2015), 'SIM benchmark_forward looking'.
[20] Ofwat (2015), 'Ofwat's initial submission to the Competition and Markets Authority following the acquisition of Bournemouth Water Investments Limited by Pennon Group plc', June, p. 74.
[21] Indeed, the change matrices included in Ofwat's analysis suggest that there is about a 50% chance of an upper-quartile company remaining in the upper quartile over a five-year period.
[22] Ofwat (2015), 'Ofwat's initial submission to the Competition and Markets Authority following the acquisition of Bournemouth Water Investments Limited by Pennon Group plc', June, p. 72.

convergence by 2020. Therefore, a static approach is likely to significantly overstate the impact of the merger on the SIM.

4 Conclusion

While we broadly consider that the forward-looking approach that Ofwat has taken to estimate the impact of the merger on the SIM to be appropriate (although somewhat aggressive—see section 3.3), we do not consider that it is appropriate to assume that all comparative benefits of SBW are instantly lost, and that the SIM will remain a valid metric beyond AMP6.

SBW will clearly continue to provide some comparative benefit in AMP6, as both SWW and SBW will maintain separate reporting throughout the AMP. It will also take time to fully integrate the two companies' operations, which will maintain a sizeable degree of management independence into the AMP.

There is strong evidence to suggest that industry SIM scores will have significantly converged by the start of AMP7, thus the SIM will not be a valid performance metric beyond AMP6. Furthermore, Ofwat has already acknowledged that it could draw on comparators from other sectors to assess retail service quality and, therefore, water companies have relatively less value as comparators.

Adjusting Ofwat's analysis to assess detriments from the middle of AMP6 until the start of AMP7 reduces Ofwat's forecast impact of £10m to £3.3m. This falls within the range of £0.8m to £3.5m that we provided as part of our initial submission.

Furthermore, due to the other modelling assumptions that Ofwat has made—i.e. that there will not be any service improvements resulting from the merger, and that companies' relative rankings do not change over time—**we consider that the figure of £3.3m should be considered as an upper-bound estimate**.

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Oxera response to Ofwat's initial submission on wholesale cost benchmark

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Contents

Summary

In its initial submission assessing the impact of the merger between South West Water (SWW) and Bournemouth Water (SBW), Ofwat used two approaches to assess the impact on the wholesale benchmark.[1] Under its static approach, Ofwat assessed the impact of losing SBW as a comparator on the PR14 upper-quartile (UQ) benchmark based on historical cost performance. Under its forward-looking approach, Ofwat assessed the future impact of losing SBW as a comparator using historical and business plan forecast data. In both approaches, Ofwat's analysis[2] quantified the value of SBW as a comparator in the industry. Ofwat has also stated that it would place greatest weight on the assessment of detriment that is based on the historical cost performance.[3] While Ofwat has noted that synergy savings arising from the merger could have an impact on its analysis, it has not considered them due to, in its view, 'no public commitment or undertaking'.[4]

Our assessment is that Ofwat's analysis does not consider the outcomes in the factual and counterfactual cases appropriately. It simply estimates the value of SBW in the counterfactual case.[5] Our analysis in the technical annex is consistent with the Competition and Markets Authority's (CMA) merger guidance and issues statement.[6,7] Our approach, at a conceptual level, is also consistent, in this regard, with how Ofwat has considered the impact of this merger on SIM and ODI.[8]

In our technical annex, we focused on the forecast position of companies as assessed by Ofwat at PR14, as this merger is going to affect the wholesale benchmark going forward, and companies' historical position is not relevant for forecasting their starting position at PR19. In addition, in contrast to previous water price control reviews, Ofwat assessed business plan forecast data in PR14, such that forecast efficiency scores and rankings for the companies are more readily available than in previous merger inquiries. [✂] **For these reasons, we consider that companies' forecast positions provide the most appropriate starting point to assess the impact of *this* merger.**

One of the limitations with Ofwat's analysis is that it does not explicitly take account of the impact of synergy savings from this merger. We have considered some modifications to Ofwat's approach to make its analysis more

[1] The approach is explained in detail in Appendix A3.3.3 of Ofwat (2015): 'Ofwat's initial submission to the Competition and Markets Authority following the acquisition of Bournemouth Water Investments Limited by Pennon Group plc', June.
[2] Ofwat (2015): 'Wholesale benchmark_changes approach.xls', June. Obtained by Oxera as part of Ofwat's initial submission to the Competition and Markets Authority following the acquisition of Bournemouth Water Investments Limited by Pennon Group Plc.
[3] See p. 50 of Ofwat (2015): 'Wholesale benchmark_changes approach.xls', June. Obtained by Oxera as part of Ofwat's initial submission to the Competition and Markets Authority following the acquisition of Bournemouth Water Investments Limited by Pennon Group Plc.
[4] See p. 50 of Ofwat (2015): 'Wholesale benchmark_changes approach.xls', June. Obtained by Oxera as part of Ofwat's initial submission to the Competition and Markets Authority following the acquisition of Bournemouth Water Investments Limited by Pennon Group Plc.
[5] Ofwat has assumed that the merger between SWW and SBW will result in the loss of SBW as the merged company will be more like SWW due to its size and as SBW is being acquired by the parent company of SWW. This is inconsistent with how Ofwat treats data on merged companies in its PR14 wholesale and retail benchmarking analysis (and in previous reviews as well) where they assume the merged company to be a 'new' observation in the sample derived using a weighted average of the merging companies irrespective of the size of the acquired company.
[6] CMA (2015): Completed acquisition by Pennon Group plc of Bournemouth Water Investments Limited: Statement of Issues, July
[7] CMA (2014): 'Mergers: Guidance on the CMA's jurisdiction and procedure', January
[8] See Appendices A6.4 and A6.5 of Ofwat (2015): 'Ofwat's initial submission to the Competition and Markets Authority following the acquisition of Bournemouth Water Investments Limited by Pennon Group plc', June.

merger-specific.[9] As part of the modifications, we have also considered the impact of synergy savings on the benchmark. As noted in our technical annex, **the synergy savings are likely to create a better comparator than either of the merging parties, thereby setting a more challenging benchmark on the rest of the industry in the post-merger case.** As such, it is essential to take account of the impact of such synergy savings, as they could produce a benefit for Ofwat's comparative efficiency regime.

In addition, we have identified a number of limitations with Ofwat's forward-looking approach. For example, i) the scenarios considered are not exhaustive and have been inadequately defined; ii) only one approach to computing the probabilities of rank movements has been considered, which has its limitations; iii) the approach contains elements that are extraneous to the calculation of the value of SBW; iv) the approach assumes that efficiency scores in the industry remain unchanged over 30 years; and v) the approach assigns *a priori* values for the likelihood of some scenarios.

Notwithstanding the methodological issues we have identified with its analysis, Ofwat has stated that it may not consider the synergy benefits in its analysis in the absence of a public commitment or undertaking. We do not consider this reasoning to be appropriate. The key issue is to determine whether the synergy savings indicated by the Pennon Group in its business case are likely to result from the merger. To the extent that they are, then they should be taken account of in the modelling to determine whether the merger is likely to result in comparative prejudice. It is our understanding that sustainable and incremental synergy savings are very likely to occur, but at this stage their exact value is unknown. As such, we have modelled relatively conservative[10] synergy savings and quantified their impact on the benchmark.

Our overall conclusion is that Ofwat's analysis has a number of limitations and its submission does not raise any issue that would lead us to amend our initial submission on this issue. As such, our conclusion, based on following a framework that is consistent with the CMA's merger guidance and issues statement is:

The SWW–SBW merger results in a company that is likely to be a better comparator, benefiting Ofwat's comparative efficiency regime on the wholesale cost in terms of setting a more stringent efficiency challenge on the rest of the industry.

[9] The amendments we have considered include extending the number of scenarios to capture all potential possibilities, deriving the likelihood of the scenarios using observed frequencies using Ofwat's changes approach from the simulation model, and estimating the impact of synergy savings on the likelihood of these scenarios. Due to limitations with Ofwat's modelling architecture, these amendments would still not capture the wider benefits from synergies on the rest of the industry. However, despite this limitation, the amended Ofwat framework for the forward-looking approach suggests a potential benefit from the merger.
[10] We have only included 25% of expected synergy savings in the analysis. In particular, [≫].

1 Introduction

This submission presents Oxera's response to Ofwat's initial submission on the wholesale benchmark analysis.[11] In particular, we focus on the potential limitations with Ofwat's analysis and discuss how the analysis presented in our technical annex remains a more robust approach for quantifying the impact of the merger between SWW and SBW on the wholesale benchmark.

This report is structured as follows.

- Section 2 outlines Ofwat's wholesale benchmark changes approach.
- In section 3, we discuss a number of issues with Ofwat's approach. The section explains why Ofwat's approach simply quantifies the value of SBW as a comparator in the counterfactual case. We explain that such an analysis is insufficient, as it overlooks entirely what is likely to happen in the post-merger 'factual' case. Oxera also points to other weaknesses in the analysis and suggests possible improvements.
- Section 4 concludes.

[11] See Appendix A3.3 of Ofwat (2015), 'Ofwat's initial submission to the Competition and Markets Authority following the acquisition of Bournemouth Water Investments Limited by Pennon Group plc', June.

2 Overview of Ofwat's analysis

Ofwat has quantified the impact on the wholesale benchmark using a **static approach**, describing it as 'a hypothetical analysis of the impact of the merger'.[12] In doing so, it has used the companies' historical (i.e. AMP5) positions. Ofwat has computed the impact of removing SBW, the frontier company, from the industry, on the UQ benchmark and then multiplied this shift by the industry TOTEX.

Ofwat has also quantified the impact on the wholesale benchmark by using a '**forward-looking approach**'.[13] Oxera has previously referred to this kind of approach as the 'deterministic approach'. As in the static approach, this approach simply quantifies the value of SBW as a comparator in the pre-merger industry. It is based on:

- probabilities that SWW and SBW are UQ companies in future price reviews (derived using Ofwat's modelled changes approach). However, the likelihood of SWW (and the merged entity) to be in the UQ or not is not considered as Ofwat's analysis merely quantifies the value of losing SBW;
- averaging across results obtained from using historical and forecast starting positions and efficiency scores of companies as determined by Ofwat at PR14;
- not considering the impact of synergy savings on the wholesale benchmark and therefore the industry allowance;[14]
- six scenarios defined based on the rankings of SWW, SBW, and the merged entity relative to the UQ benchmark,[15] defined such that the direction of impact in each scenario depends on *only* SBW's position;
- probabilities assigned to the six scenarios on an *a priori* basis. These probabilities, like the definition of scenarios, have no impact on the answer—i.e. the value as comparator of SBW in the pre-merger industry.

The results obtained by Ofwat are consistent with the value of comparator it has computed for SBW previously at PR14.[16,17]

[12] See Ofwat (2015): 'Ofwat's initial submission to the Competition and Markets Authority following the acquisition of Bournemouth Water Investments Limited by Pennon Group plc', June, p. 39.
[13] The approach is explained in detail in Appendix A3.3.3 of Ofwat (2015), 'Ofwat's initial submission to the Competition and Markets Authority following the acquisition of Bournemouth Water Investments Limited by Pennon Group plc', June.
[14] This follows necessarily because Ofwat's framework does not consider the merger 'factual'.
[15] While scenarios are defined to give alternative positions to the merged entity in the industry, the probabilities assigned to these scenarios do not have any impact on the results. The reason is that the impact under each scenario depends on only the position of SBW relative to the UQ, and not on whether an UQ company is lost as the result of the merger.
[16] See Ofwat analysis on 'Benefits of comparators', http://www.ofwat.gov.uk/pricereview/pr14/pap_tec201412pr14uplift.xlsx.
[17] Oxera notes that in the case of AMP5 inputs, Ofwat appears to have applied an adjustment to the industry TOTEX forecast. This adjustment ('Industry BCT') is left unexplained.

3 Critique of Ofwat's analysis

Oxera has identified a number of shortcomings in Ofwat's analysis. Ofwat's analysis is not appropriate for quantifying the impact of *this* merger on the wholesale benchmark for the following reasons.

- **It is not merger–specific**. First, it is important to note that the merger of two companies is not the same as losing one (company). Ofwat's analysis is not sensitive to the quality of the merged entity as a comparator and simply quantifies the impact of losing SBW in the counterfactual case.

  Ofwat has assumed that the merger between SWW and SBW will result in the loss of SBW, as it assumes that the merged company will be more like SWW due to its size and the fact that SBW is being acquired by the parent company, SWW.[18] To that extent, Ofwat's analysis **simply estimates the value of SBW in the counterfactual case**. Our analysis in the technical annex is consistent with the CMA's merger guidance and issues statement.[19,20] Our approach, at a conceptual level, is also consistent, in this regard, with how Ofwat has considered the impact of this merger on SIM and ODI.[21]

  Ofwat's approach implies that its analysis would give the same answer under two incompatible assumptions—i) that the merged entity is always a frontier company; ii) that the merged entity is always the worst performer—which is not a credible outcome. This is because Ofwat's analysis does not compare the outcomes in the factual and counterfactual cases. In contrast, in its analysis on SIM and ODI, Ofwat has assessed the impact of the merger by considering the pre- and post-merger cases.

- **It is partly based on the companies' historical positions**. In our technical annex, we focused on the forecast position of companies, as assessed by Ofwat at PR14, since this merger is going to affect the wholesale benchmark going forward, and companies' historical positions are not relevant for forecasting their starting positions at PR19. [✂]

  For these reasons, we view that companies' forecast positions provide a more appropriate starting position to assess the impact of *this* merger.

- **It has not considered the impact of synergy savings on the wholesale benchmark**. As noted in our technical annex, the synergy savings have the potential to create a better comparator than either of the merging parties, thereby setting a more challenging benchmark on the rest of the industry in the post-merger case. As such, it is essential to take into account the impact of such synergy savings, as they could produce a benefit for Ofwat's comparative efficiency regime. We note that Ofwat's current analysis framework does not allow the impact of synergies to be determined, as it does not consider the post-merger 'factual' case.

[18] This is inconsistent with how Ofwat treats data on merged companies in its PR14 wholesale and retail benchmarking analysis (and also in previous reviews), where it assumes the merged company to be a 'new' observation in the sample derived using a weighted average of the merging companies irrespective of the size of the acquired company.
[19] Competition and Markets Authority (2015), 'Completed acquisition by Pennon Group plc of Bournemouth Water Investments Limited: Statement of Issues', July.
[20] Competition and Markets Authority (2014): 'Mergers: Guidance on the CMA's jurisdiction and procedure', January.
[21] See Appendices A6.4 and A6.5 of Ofwat (2015), 'Ofwat's initial submission to the Competition and Markets Authority following the acquisition of Bournemouth Water Investments Limited by Pennon Group plc', June.

An approach that is sensitive to the value of the merged entity as a comparator, such as Oxera's simulation model, will capture these effects.

- **It describes scenarios incompletely**. A scenario in which SWW is non-UQ, SBW is UQ and the merged entity is UQ, is described by Ofwat as causing a detriment. However, given Ofwat's analysis framework, in the vast majority of cases under this scenario, the net effect on the industry is likely to be beneficial, as there is one less non-UQ company post-merger. Hence, such a scenario is inadequately defined.

- **It contains elements that are redundant to the calculation of the value of SBW**. The assignment of monetary impacts to scenarios is based on the position of SBW only, and this makes the scenarios, and the related scenario probabilities, superfluous. In other words, Ofwat has simply considered two scenarios in its analysis—i.e. that of SBW being in the UQ and non-UQ—the rest of the scenarios are extraneous to its analysis.

- **It is based on only one approach to computing probabilities of rank movements**. Ofwat's changes approach uses observed changes in OPEX and CAPEX ranking to derive the *likely spread* of movements in rankings. Its *modelled* changes approach implies that different probabilities are defined for the same movement for different starting positions. The starting position of companies is therefore taken into account indirectly, but is not directly linked to the observed movements starting from any given rank.

  In our technical annex, we acknowledged that alternative approaches to deriving probabilities (in particular, the transition and changes approach) have their respective strengths and weaknesses, and reported averages from results obtained with Ofwat's approach and with Oxera's approach. Both changes and transitions methods have been used by the Competition Commission in previous merger inquiries to estimate the likelihood of movements in rankings over time. This modelling choice has the potential to reduce the sensitivity of the results to the weaknesses in any one approach.

- **It assumes that efficiency scores in the industry remain exactly at the starting point level, for each company, up to PR39**. Given past observed variation in efficiency scores, this does not appear to be a realistic assumption. In contrast, in its analysis of retail ACTS, SIM and ODI, Ofwat has assumed some convergence in companies' performance relative to the benchmark over time.

  Second, there may be non-systematic variation, or 'noise' in the efficiency scores, in addition to convergence. Oxera's simulation model has incorporated both aspects of variation in the efficiency scores over time to consider the impact of these on the results.

- **It assigns *a priori* values for the likelihood of some scenarios**. First, such assumptions are extraneous to its analysis, as the approach simply uses the probability of SBW being in the UQ or otherwise. A more appropriate approach could be to extend the scenarios to capture all possibilities and derive the likelihood of these, with and without synergy savings, using *observed frequencies* from a simulation approach as carried out in our technical annex.

4 Conclusion

In this report, Oxera has considered the main weaknesses of Ofwat's wholesale benchmark analysis. We conclude that its submission does not raise any material issue that has been overlooked in our technical annex. Our conclusion, based on following a framework that is consistent with the CMA's merger guidance and issues statement is:

The SWW–SBW merger results in a company that is likely to be a better comparator, benefiting Ofwat's comparative efficiency regime on the wholesale cost in terms of setting a more stringent efficiency challenge on the rest of the industry.

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Oxera response to Ofwat's initial submission on ODI

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Contents

Summary

In its initial submission,[1] Ofwat has proposed a detriment resulting from the merger on its ability to set Outcome Delivery Incentives (ODIs) in the range of £8m to £66m.

However, following a review of the evidence, Oxera remains of the view that there will be no detriment to customers resulting from the merger's impact on Ofwat's ability to set ODIs, for the following reasons.

- Setting such measures on a comparative basis delivers sub-optimal outcomes for customers, due to:
  - the fact that outcomes are derived by company-specific customer engagement and research on their willingness to pay. To the extent that comparative analysis delivers different outcomes to this, a comparative approach will produce sub-optimal outcomes (especially when further convergence has occurred such that the remaining differences may be due to legitimate regional variations). For example, if SWW had been set the upper-quartile target for drinking water contacts at PR14, this would have resulted in a net detriment to its customers, as the cost of the service improvement would have exceeded the benefit gained by its customers from the service improvement;
  - comparability issues. Local factors affect comparability as well as companies' ability to improve service levels. For example, SBW may have unique factors that affect its relevance as a comparator, such as a highly seasonal population with a high peak-to-average demand ratio, and around 80% of the supply to customers coming from only two water treatment works.
- At PR14, performance targets were set for the majority of performance measures without the need for industry-wide comparisons.
- Ofwat has carried out effective comparisons with ten comparators for determining sewerage ODIs and Performance Commitments (PCs).
- Convergence implies that there is limited scope for further improvement in those few areas where comparisons were undertaken (and it is questionable how much further improvement customers want to pay for, as the majority of ODIs are based on company-specific customer engagement, and their customers have already indicated how they value service levels).
- Performance against ODIs/PCs for both SWW and SBW will need to be reported in order to monitor performance against commitments at the final determinations. Given that there are no plans to remove local operational staff (particularly as SWW and SBW are not contiguous and a local presence is essential for the efficient running of any water company), the separate reporting of PCs over AMP6 by SWW and SBW should provide sufficiently independent data points for comparison purposes (if comparisons are undertaken).

[1] Ofwat (2015), 'Ofwat's initial submission to the Competition and Markets Authority following the acquisition of Bournemouth Water Investments Limited by Pennon Group plc', June;; and Ofwat (2015), 'ODI analysis'.

1 Introduction

For PR14, Ofwat moved from a predominantly *output*-based framework (for example, setting targets for the length of pipes replaced) to a more *outcome*-based framework (for example, setting targets to limit the number of interruptions to customers' supply).

Companies were given considerable freedom to develop outcomes that reflected their customers' needs. They were also able to propose their own ODIs, PCs, and the associated rewards/penalties, following engagement with their customers. However, there were a limited number of areas where Ofwat performed comparative analysis across the companies, and in some cases set targets based on an upper-quartile-based target—two of these areas are relevant to the merger (water quality contacts and interruptions to supply).

In its initial submission,[2] Ofwat has proposed a detriment resulting from the merger on its ability to set ODIs in the range of £8m to £66m. These numbers produced by Ofwat are significant given its own assessment undertaken as part of the 2014 final determinations, where it concluded:

> we have taken account of ODI performance of WoCs as part of our **qualitative assessment**. We have therefore taken account of the potential comparator benefits from ODIs in the round. However **such benefits are not large enough to change our conclusions in the draft determinations**.[3,4] [emphasis added]

Moreover, based on the findings of our analysis,[5] **we do not consider that the merger will have a net detriment on Ofwat's ability to set ODIs that are in the interests of customers**.

In the subsequent sections, we review some of the specific assumptions in Ofwat's analysis that have led to such a significant detriment figure, and evaluate what the implications of Ofwat's analysis would be if accepted. We find that setting comparative-based targets can lead to a net detriment to customers, as the costs can exceed customers' willingness to pay for the associated improvements.

[2] Ofwat (2015), 'Ofwat's initial submission to the Competition and Markets Authority following the acquisition of Bournemouth Water Investments Limited by Pennon Group plc', June; and Ofwat (2015), 'ODI analysis'.
[3] Ofwat (2014), 'Final price control determination notice: policy chapter A7 – Annex 3: benefits assessment of an uplift on the cost of capital', p. 9.
[4] Moreover, in the draft determinations, Ofwat stated: 'We do not rely on comparators for our assessment of PCs and ODIs, although may be draw on comparators to support interventions in companies' plans. While when making comparisons between companies we may draw on evidence from WoCs, we do not consider that the loss of one or more WoCs would make these comparisons any less valid as there would still be a number of companies to use for comparisons (and are used for wastewater PCs and ODIs) and comparisons do not use statistical techniques. Consequently, we do not consider that there would be costs from the loss of one or more WoCs in terms of PCs and ODIs.' Ofwat (2014) 'Annex to technical appendix A6 – benefits assessment from a company-specific uplift on the cost of capital', p. 29.
[5] See Oxera (2015), 'Annex F Oxera – Outcome delivery incentives'.

2 An overview of Ofwat's analysis

2.1 Forward-looking analysis

In the final determinations of PR14, Ofwat assessed whether it should provide a company-specific uplift to the allowed cost of capital,[6] concluding that there was no quantifiable impact on customers relating to ODIs.

For its initial submission,[7] Ofwat has developed a quantitative analysis.

For supply interruptions and water quality contacts, Ofwat's analysis assumes a level of performance improvement (presented as a range) for the worst-performing company on each metric. It then distributes companies within the range between the industry's best and worst performer, and assesses the effect on the upper quartile pre- and post-merger. The approach assumes that companies' relative positions are maintained going forward.

The change in the upper-quartile benchmark is then multiplied by the penalty rates that each company was set as part of the 2014 final determinations. That is, the rates at which companies receive penalties should they miss their performance commitments.

Ofwat has considered using both companies' specific performance penalties to calculate the impact, and the median penalty rate, as there is significant variation in penalty rates across companies.

Ofwat has assumed the calculated impact is applied equally to all years in AMP7.

2.2 'Static' analysis

As well as its forward-looking analysis, Ofwat provides a 'static' analysis looking back at PR14.

The analysis estimates the effect on the upper quartile at PR14 assuming that, instead of SWW and SBW having separate performance levels, there had been a single entity with a weighted average of the two companies' performance levels.

[6] Ofwat (2014), 'Final price control determination notice: annex 3 – benefits assessment of an uplift on the cost of capital'
[7] Ofwat (2015), 'ODI Analysis'.

3 Oxera's response to Ofwat's analysis

Below, we review some of the specific assumptions included in Ofwat's analysis.[8]

For the avoidance of doubt, we are not proposing that Ofwat's analysis should simply be 'tweaked' to address the issues we identify below. While doing so could somewhat improve the robustness of the resultant figures (and would significantly reduce the estimated detriment), for the reasons stated above, we do not consider that there will be a net detriment resulting from the merger with regard to ODIs, as we do not consider that it is the best outcome for customers for Ofwat to set ODIs on a comparative basis.

3.1 Structure of analysis

Ofwat's analysis assumes a level of performance improvement for the worst-performing company. It then distributes companies within the range between the industry's best and worst performer, and assesses the effect on the upper quartile pre- and post-merger. The approach assumes that companies' relative positions are maintained going forward.

This is notably different from the 'changes approach', which Ofwat has used for the wholesale and retail modelling. The changes approach weights the impact of losing an upper-quartile performer by the probability that the merger would remove a future upper-quartile performer.

By retaining existing rankings, Ofwat is effectively assuming a 100% likelihood that SBW will continue to be an upper-quartile performer. However, there is not a 100% chance of this being the case,[9] not least because there have not been financial incentives in place for theses metrics in the past. Going forward, we expect companies to place a significantly greater focus on improving their performance, which may result in SBW being overtaken as an upper-quartile performer. Therefore, the estimated impact is overstated compared with the probabilistic approaches that Ofwat has used elsewhere.[10]

Also, by assuming that companies are distributed within the forecast range with the relative distributions kept the same, Ofwat is assuming that there is no particular convergence among the better-performing companies. This may be a particularly unrealistic assumption, given that companies have performance commitments, with many being set the PR14 upper-quartile level as their target.

If companies were to achieve their performance commitments (as they are financially and reputationally incentivised to do), there will be strong convergence in performance towards the existing upper-quartile level.

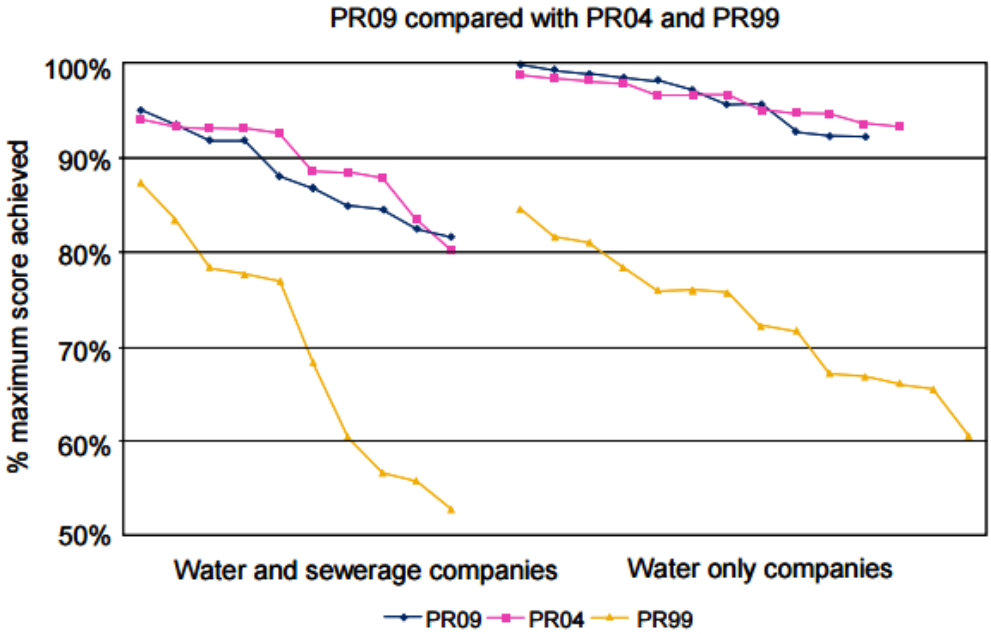
The level of performance improvement that Ofwat assumes for the worst-performing company is arbitrary, and significantly affects the results obtained from using Ofwat's approach. Ofwat assumes a range from 25% to 75% of the gap being closed between the worst performer and the upper quartile for water quality contacts, and 10% to 60% for interruptions to supply.

[8] Ofwat (2015), 'ODI analysis'.
[9] For example, the change matrices in Ofwat's SIM analysis suggest that there is about a 50% chance of an upper-quartile company remaining in the upper-quartile over a five-year period. See Ofwat (2015), 'SIM benchmark_forward looking'.
[10] A parallel can be drawn with previous merger cases in which Ofwat did not use a probabilistic approach but the Competition Commission did. See Competition Commission (2007), 'South East Water Limited and Mid Kent Water Limited', paras 5.8, 5.9, and 5.36.

These improvement levels are below the expectation that Ofwat set in the final determinations, where it stated:

> by the middle of the 2015-20 period, we expect all companies to reach current upper quartile performance. We have tested these new improvement assumptions by assessing companies' relative performance improvements in the Overall Performance Assessment (OPA).

The OPA was a performance incentive that Ofwat used to operate (it has since been superseded by the SIM), and was first introduced at PR99. By PR04, industry scores had heavily converged (see chart below).



Source: Ofwat (2009), 'Future water and sewerage charges 2010-15: Final determinations', p. 41.

The worst-performing company improved from a score of 52.9% at PR99 to 80.3% at PR04. This was above the upper-quartile performer at PR99—i.e. this would be closing the gap by 107%, which is significantly above the top end of the range Ofwat assumed in its analysis for both water quality contacts and interruptions to supply.

Using this evidence on convergence, and simply increasing the rate at which the worst-performing company improves within Ofwat's approach, significantly reduces the forecast detriment (it reduces Ofwat's range from between £8m and £66m to between £2m and £11m).

3.2 The use of a glide path

Ofwat has assumed that the difference in the benchmark is applied equally to all years in AMP7. At PR14, a three-year glide path was applied for companies to move from their current performance levels to the benchmark. Having a glide path for any service improvements in the future is likely to be even more important, as it should become increasingly difficult to deliver incremental improvements to service.

Applying a glide-path effect, reduces the impact by two-thirds in the first year, and one-third in the second year (over a 20% reduction in total).

3.3 Reward/penalty rates

Ofwat has used the penalty rates set out in the final determinations to monetise the impact on customers of having a lower upper-quartile target.

Companies' ODIs include penalty and reward rates for under- or out-performing their targets. Often, these are different rates. In setting incentive rates, matters to consider include the following.

- Penalties need to be of sufficient size to deter the company from missing its targets.
- As improved performance is generally expected to result in diminishing returns to customers, all else being equal, rewards should not be bigger than penalties, as customers experience greater loss from a reduction in service than the benefits of an improvement in service.[11]
- Rewards should not be above the value that customers place on an improvement in service above the benchmark; otherwise customers would experience a reduction in overall utility should a company outperform its target.

Since the purpose of a future upper-quartile benchmark would be to drive further improvements in the industry, using the penalty rates from the final determinations to estimate the value of a higher benchmark is likely to overstate the value. This is due to the regulator potentially setting penalties above the value to the customer of the service loss to disincentivise companies from cutting service, and potentially seeking to align the structure of penalties with the diminishing returns cost function (the first two bullet points above).

Likewise, using the reward rates might understate the value, due to the likelihood of the regulator setting these below the value to customers of the service improvement (the third bullet point above).

Either way, customers are unlikely to value a change in industry performance at either the penalty or the benefit rate of incentive. However, by using the penalty rates, Ofwat is overstating the value that customers attribute to further improving service levels.

The impact of using penalty and reward rates is shown below. The numbers presented include the higher convergence rate and glide-path adjustments described above.

Table 3.1 Difference in impact between penalty and reward rates

	Penalty rates	Reward rates
Interruptions to supply		
Median rate	0.9	0.4
Company-specific rate	5.2	2.6
Water quality contacts		
Median rate	0.8	0.6
Company-specific rate	3.6	2.5

Source: Oxera analysis.

[11] However, there may be other policy reasons for setting higher rewards, such as the potential behavioural effect of such incentive structures.

As can be seen above, using reward rates can suggest a total detriment in the range of £1.0m to £5.1m, compared with the range of £1.7m to £8.8m implied by using penalty rates (i.e. it reduces the impact by over 40%).

3.4 Confidence of data

Few types of data are 100% accurate. In the past, companies have provided 'confidence grades' for the data they report.[12] Typically, companies have assessed data on interruptions to supply to be accurate to within 5–10%.

The upper-quartile benchmarks forecast by Ofwat are shown below.

Table 3.2 Ofwat's AMP7 upper-quartile interruptions to supply forecast

	10% scenario	35% scenario	60% scenario
Pre-merger	11.6	9.8	8.0
Post-merger	11.9	10.0	8.1

Source: Ofwat (2015), 'ODI analysis'.

Ofwat's forecast difference in the benchmark arising from the merger is well within the scope of general measurement error. Indeed, at PR14 Ofwat rounded the upper-quartile target of 12.3 to 12. At this level of rounding, there is no effect on the benchmark from the merger for interruptions to supply ODIs.

While confidence grades were not previously reported for water quality contacts, there will be some degree of error in measurement. These errors will hold far greater significance if targets are to be set within a highly converged industry.

3.5 Local factors

In addition to data accuracy, local factors may affect companies' ability to improve their service levels and reduce the comparability of ODIs, such that some differences are to be expected between companies. As convergence in performance occurs and the differences between companies becomes smaller, this issue becomes more significant (see section 2.5 of Oxera (2015)[13]).

3.6 Implications of Ofwat's analysis

As part of PR14, Ofwat required companies to submit information on the marginal cost of performance, and the associated willingness to pay of customers (Ofwat stated that it 'had relatively high confidence in the business plans and the proposed outcomes and performance commitments'[14] that SWW provided). The table below shows this information for both interruptions to supply and drinking water contacts.

[12] See Ofwat, 'June Returns', http://www.ofwat.gov.uk/regulating/junereturn/.
[13] Oxera (2015), 'Annex F: Oxera – Outcome delivery incentives'.
[14] Ofwat (2014), 'Final price control determination notice: company-specific appendix – South West Water', p. 16.

Table 3.3 Performance cost and benefits

Interruptions to supply	Marginal cost of performance change (£m)		
	16.2 to 12	12 to 9.4	9.4 to 6
Annualised willingness to pay (change from 2014–15 level)	0.610	0.375	0.230
Annualised other benefits (change from 2014–15 level)	-0.027	-0.041	-0.061
Annualised costs (change from 2014–15 level)	0.218	0.328	0.492
Net benefit	0.365	0.006	-0.323

Drinking water contacts	Marginal cost of performance change (£m)		
	4.5 to 3.0	3.0 to 2.5	2.5 to 2.0
Annualised willingness to pay (change from 2014–15 level)	1.294	0.431	0.144
Annualised other benefits (change from 2014–15 level)	-0.030	-0.087	-0.255
Annualised costs (change from 2014–15 level)	0.239	0.702	2.064
Net benefit	1.025	-0.358	-2.175

Note: South West has extrapolated data for interruptions for supply <9.4mins/prop/yr and drinking water contacts <2.5/1000 props using the same trend as previous marginal cost and performance changes.

Source: South West Water (2014), 'Business plan table 2a'.

As can be seen above, as performance increases, not only does customers' willingness to pay decrease, but the marginal costs of service improvement increase.

At PR14, SWW's drinking water contact's target was not set at the upper-quartile level due to the company's business plan being classified as 'enhanced' (Ofwat chose to accept its performance commitments 'in the round'). However, as can be seen above, if SWW had been set the upper-quartile target of 1.23, this would have resulted in a net detriment of £2.2m (that is, the costs of the service improvement would significantly outweigh the benefit gained by customers from the incremental level of service).

Such detriments might have been limited at PR14 as a number of companies had fairly low performance levels; however, as performance levels across the industry improve (and the upper quartile improves), it can be expected that setting targets that are not based on company-specific cost functions and willingness to pay will lead to a sub-optimal outcome and an overall detriment for many customers[15] (the counterfactual being that additional costs are not incurred, and instead bills are decreased).

3.7 Ofwat's 'static' analysis

As well as its primary stated range, Ofwat provided a 'static' analysis looking back at PR14. This analysis is less appropriate than Ofwat's forward-looking approach for estimating the impact of the merger on Ofwat's ability to set ODIs.

The 'static' analysis looks backwards to when companies did not have performance commitments or financial incentives to improve their service

[15] While cost and willingness to pay functions may vary to some degree across the industry depending on local factors, we expect the shape of the curves to be broadly the same.

performance for these metrics. Therefore, there is inevitably going to be a greater spread of performance across the industry.

We agree with Ofwat that the introduction of the ODIs 'could lead to convergence in different companies' performance over a relatively short period of time.'[16]

Also, if the static analysis were to be taken as a view of the future detriment of a merger, it would be implicitly assuming that there is a 100% chance of SBW being in the upper quartile. Clearly, there is not a 100% chance of this being the case (see section 3.1).

Therefore, we also reject the static analysis, both on principle and in relation to its specific structure.

[16] Ofwat (2015), 'Ofwat's initial submission to the Competition and Markets Authority following the acquisition of Bournemouth Water Investments Limited by Pennon Group plc', June, p. 66.

4 Conclusion

At PR14, most performance targets were set following extensive engagement with customers. This will become even more important going forward, as it is uncertain how much further improvement customers want to pay for. There are also comparability issues that could detract from the validity of a comparative approach, such as local factors affecting performance.

Ofwat's quantification is a shift in its previous assessment of there being no quantifiable impact, and is significantly at odds with our analysis of ODIs.

A review of the evidence leads us to conclude that the merger will not have a net impact. Specifically, in relation to Ofwat's analysis we have identified a number of limitations, such as the assumption that rankings will remain constant, that there will be limited convergence, the use of penalty rates as a proxy for customers' willingness to pay for service improvement, and the lack of a performance glide path.

In addition to these issues, Ofwat's analysis has serious practical implications. Namely, that adopting upper-quartile performance measures creates a net detriment in a number of circumstances, as costs outweigh the benefits to customers because outcomes are derived by company-specific customer engagement and research on their willingness to pay. To the extent that comparative analysis delivers different outcomes to this, a comparative approach will produce sub-optimal outcomes (especially when further convergence has occurred such that the remaining differences may be due to legitimate regional variations). For example, if SWW had been set the upper-quartile target for drinking water contacts at PR14, this would have resulted in a net detriment to its customers, as the cost of the service improvement would have exceeded the benefit gained by its customers from the service improvement.

We conclude that the merger will not have a net detriment on Ofwat's ability to set ODIs that are in the interests of customers.

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Oxera response to Ofwat's initial submission on precision

Prepared for
South West Water
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Contents

Summary

Ofwat's initial submission examining the impact of the merger between South West Water (SWW) and Bournemouth Water (SBW) on the precision of Ofwat's wholesale benchmarking models[1] indicates a potential detriment between 0.21% and 3.8%. However, Ofwat has noted that this detriment, 'of itself, would not have prevented [it] from using the wholesale water cost models at PR14.'[2]

In a similar vein, Ofwat concluded in its PR14 value of comparator analysis that the loss of a water-only company would not result in it setting a less stringent efficiency challenge to compensate for any lack of precision in its models.[3] In contrast, in its initial submission, Ofwat's concludes that there is a detriment in precision, which is not consistent with our findings. In particular, our view is that there is no material impact on precision from the merger and thus there is no prejudice.[4]

Our review of Ofwat's analysis on precision has identified three key limitations, as follows.

- Under the 'specific approach', **Ofwat's estimation of the precision impact is conflated with the benchmark effect. Its subsequent attempt to separate the two is purely ad hoc, has no statistical basis, and departs from the Competition Commission's (CC) approach to assessing this issue in previous cases.**[5] Precision is a statistical measure of uncertainty in the parameter estimates. The CC considered the impact of previous mergers on the uncertainty compared with the pre-merger case. Ofwat's approaches, which quantify a detriment of between 0.21% and 3.8%, consider the impact of the merger on the upper-quartile (UQ) benchmark and model predictions, both of which are functions of the parameter estimates rather than their underlying uncertainties. However, these estimates cannot be interpreted as measures of precision.

  Moreover, the impact on the UQ benchmark is examined separately when considering the impact of the merger on the wholesale cost benchmark. In its submission, Ofwat does not clearly define precision and thus what it is estimating. Appropriate measures of precision include those that are examined in Oxera (2015)[6] and in the academic literature[7]—for example, R^2 and confidence widths of parameters or predictions.

- **Ofwat's 'general approach' is limited and can only give a theoretical assessment of the precision impact.** The application of this approach to

[1] Ofwat (2015), 'Ofwat's initial submission to the Competition and Markets Authority following the acquisition of Bournemouth Water Investments Limited by Pennon Group plc', June.
[2] Ibid., p. 4.
[3] Ofwat (2014), 'Final price control determination notice: annex 3 – benefits assessment of an uplift on the cost of capital', December, p. 8, https://www.ofwat.gov.uk/pricereview/pr14/det_pr20141212riskrewardbenefits.pdf.
[4] Oxera (2015), 'Annex B Oxera - Precision', June.
[5] See for example, Competition Commission (2007), '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, http://webarchive.nationalarchives.gov.uk/20130704020426/http://www.competition-commission.org.uk/assets/competitioncommission/docs/pdf/non-inquiry/rep_pub/reports/2007/fulltext/525.pdf; Competition Commission (2012), 'South Staffordshire plc/ Cambridge Water plc merger inquiry (CC)- Appendices and Glossary', May, available at: http://webarchive.nationalarchives.gov.uk/20140402141250/http://www.competition-commission.org.uk/assets/competitioncommission/docs/2012/south-staff-cambridge-water/final_appendices_and_glossary.pdf
[6] See sections 4 and A4 of Oxera (2015), 'Annex B Oxera - Precision', June.
[7] See, for example, Kumbhakar, S. and Horncastle, A. (2010), 'Improving the Econometric Precision of Regulatory Models', *Journal of Regulatory Economics*, **38**:2, October. Both authors of this paper are associated with Oxera.

the PR14 model specifications is inappropriate, since it gives implausible results from an economic and operational standpoint. This is due to complexity in Ofwat's cost models (including squared terms and cross-products).

- Even within Ofwat's approaches, we have identified a number of modelling errors and inconsistencies. Notably, **Ofwat's application of bootstrapping is not consistent with that considered by the CC in previous mergers**.

In the current panel framework, the improvement in the statistical precision of econometric modelling is significantly higher when compared with a cross-sectional approach, such as that used in PR09. In such a framework, any impact on precision can be easily offset and improved by extending the time period modelled. Ofwat discuss possible concerns with changes in data definitions. However, it is possible to extend the water panel dataset using additional outturn data, since the 2013/14 and 2014/15 water data is already available and does not appear to present any differences in definition from that used at PR14.

A further additional mitigation strategy would be to simplify the models. For example, one of Ofwat's models, WM3, has 26 cost drivers. In contrasts, its models in PR09 generally had only one or two cost drivers. Ofwat did not discuss this possible strategy in their initial submission.

To this extent, we view that Ofwat's counterarguments to the actions that could be taken if there was perceived to be any detriment are not justified. We therefore maintain our view that **extending the time series in the cost models, or decreasing the number of cost drivers, remains an effective and feasible mitigating strategy**.

In conclusion, Ofwat's analysis in its initial submission does not raise any issue that would lead us to alter our original conclusion. Based on our assessment following the approaches considered by the CC in previous inquiries, we view **that there is no material impact on precision from the merger and thus there is no prejudice**.

1 Introduction

This report presents Oxera's response to Ofwat's precision assessment in its initial submission concerning the merger of SWW and SBW.[8] The report is structured as follows.

- Section 2 provides an overview of Ofwat's precision assessment, describing the modelling approaches used and providing its main estimates of the precision impact of the merger.
- In section 3, we provide our response to Ofwat's assessment. The section examines the main modelling issues identified in each approach undertaken by Ofwat (theoretical, generic and specific) and highlights where we disagree with the application of the modelling techniques adopted.
- Section 4 concludes.

[8] Ofwat (2015), 'Ofwat's initial submission to the Competition and Markets Authority following the acquisition of Bournemouth Water Investments Limited by Pennon Group plc', June.

2 An overview of Ofwat's approach

Like Oxera, Ofwat has considered three main approaches (theoretical, general and specific), and has used bootstrapping as an alternative to the general approach. An overview of Ofwat's application of each approach is set out below.

2.1 Theoretical approach

In section A4.2.2 of its submission,[9] Ofwat presents the theoretical attrition rates for the main PR14 models, which align with Oxera's assessment in section 2 of Oxera (2015).[10] In section A6.2.2, Ofwat considers the possibility of extending the time series in its models and states that increasing the time series in the models 'would increase the number of observations, potentially increasing the robustness of model estimates.'[11]

In relation to the theoretical impact of increasing the sample size by extending the timeframe of analysis, Ofwat argues that it is necessary that data definitions do not change over time, and provides an example of when two years of data (2000–01 and 2001–02) were considered unfit for the purposes of modelling wastewater costs because of an external event that resulted in a data consistency issue.

Moreover, Ofwat argues that:

> random effect models assume that relative efficiencies stay constant over the period modelled which becomes a harder assumption to justify as the panel lengthens[12]

2.2 General approach

Ofwat has produced three 'general approach' estimates.

- The first is intended to replicate the '**original** approach' based on regulatory precedents. Ofwat has cautioned against using results from this approach, as 'moving all of the coefficients in the same direction exaggerates the precision range and consequently the change in precision range.'[13]
- The second, called the '**confidence interval'** approach, is used as a central estimate and considers total inefficiency to the UQ. In this case, companies' modelled cost (i.e. predicted cost) are adjusted on the basis of its standard error. This approach is new and is a modification of the general approach considered by the CC.
- Ofwat states that the **'prediction interval'** approach takes into account additional uncertainty in the variation of the error. Since this alternative gives an extreme loss of precision, and since the approach is considered by Ofwat as 'not without limitations,'[14] the 'general approach' estimate based on the 'confidence interval' application is deemed by Ofwat to be more reasonable.

[9] Ofwat (2015), 'Ofwat's initial submission to the Competition and Markets Authority following the acquisition of Bournemouth Water Investments Limited by Pennon Group plc', June.
[10] Oxera (2015), 'Annex B Oxera - Precision', June.
[11] Ofwat (2015), 'Ofwat's initial submission to the Competition and Markets Authority following the acquisition of Bournemouth Water Investments Limited by Pennon Group plc', June, p. 114.
[12] Ibid., p. 114.
[13] Ibid., p. 88.
[14] Ibid., p. 88.

Based on the alternatives examined, Ofwat concludes that the general approach 'is not very robust on its own and it assumes that everything in the modelling, apart from the degrees of freedom of the standard errors, is held constant.'[15]

More generally, Ofwat has some concerns about the reliability of these estimates, since:

> it is difficult to apply the general approach on such complex models due to the interaction of translog terms and the high level of multi-collinearity between some of the variables[16]

Ofwat has stated that bootstrapping can serve as a cross-check to the general approach.[17] This is examined below.

2.3 Bootstrapping

Given the limitations of the general approach, where the specifics of the merging companies and the merged entity are not considered, Ofwat suggests that bootstrapping can be used as a valid cross-check and alternative to the generic approach results. The approach is based on repeated estimation through re-sampling, and can be used to assess how the level of confidence associated with the standard errors changes depending on the pre- and post-merger industry structures estimated with the PR14 models. Ofwat found that the *bias* in the estimated standard errors could be about 1% with respect to the bootstrapped standard errors or about 3% with respect to the original (PR14) standard errors.[18]

2.4 Specific approach

The specific approach is based on re-running the PR14 models and replacing SWW and SBW with the merged entity. Ofwat acknowledges that its precision impact (which, as we highlight below, is not in fact a measure of precision) may be confounded by changes in technology:

> this impact will be made up of both changes due to the reduction in precision of our models, but also by the relative efficiency of different water companies[19]

and:

> Given the nature of the econometric benchmarking there is no specific technical method for decomposing the impact [into loss of precision and changes in relative efficiency] calculated above in to the efficiency loss (changes in the prediction line) and precision loss (confidence in the prediction line)[20]

Under the specific approach, Ofwat has examined two alternative modelling methods.

- Ofwat has examined the shift in the historical UQ after re-estimating with the merged company. It shows that running the models with the merged company results in a less stringent historical UQ assessment, and thus a precision detriment (the UQ increases by 0.53%). This result is found to be insensitive to the introduction of synergy savings over the historical period.

[15] Ofwat (2015), 'Ofwat's initial submission to the Competition and Markets Authority following the acquisition of Bournemouth Water Investments Limited by Pennon Group plc', June, p. 88.
[16] Ibid., p. 84.
[17] Ibid., p. 91.
[18] Ibid., p. 90.
[19] Ibid., p. 77.
[20] Ibid., p. 80.

- As an alternative, Ofwat has attempted to decompose the overall impact into the loss of precision and changes in relative efficiency. In this context, it states that the main impact of the merger on the prediction line is likely to come from losing the comparator features of SBW. The precision impact is obtained by subtracting:

  - the range of the differences between the (historical) baseline modelled costs and the modelled costs when SBW is dropped

  from

  - the range of the differences between the baseline modelled costs and the modelled costs in the post-merger case.

This change in model 'ranges' as a proportion of the historical industry allowance is considered to give the precision impact.

Section 3 provides Oxera's response to a number of statements made by Ofwat and examines a number of high-level issues with its approach.

3 Critique of Ofwat's analysis

Oxera has identified a number of limitations with Ofwat's precision analysis. Some of these limitations are listed and discussed below.

3.1 Ofwat's specific approach

Precision is a statistical measure of uncertainty in the parameter estimates. The CC considered the impact of previous mergers on the uncertainty compared with the pre-merger case. For example, the CC considered a number of relevant statistical tests and techniques (such as R^2, 95% confidence widths, outlier analysis) to understand the impact on the uncertainty in previous merger inquiries.[21] However, Ofwat's approach is problematic, as its analysis does not examine these measures of statistical precision. Instead, its analysis focuses on the UQ benchmark, which is not a measure of precision and it is unclear what the link is between precision and this measure. As such, **Ofwat's analysis fails to consider a number of important tests to estimate the impact on the uncertainty (and thereby, precision) as used in the context of previous merger inquiries.[22] Oxera's analysis contains these tests, which show no substantial loss of precision. In fact, the average relative accuracy of the cost predictions (as given by the confidence widths) marginally improves post-merger.** Discussion on these measures of precision, with and without the merger, as examined in Oxera (2015)[23] and indicated in Kumbhakar and Horncastle (2010),[24] is missing from their analysis.

In relation to the modelling approach used by Ofwat, the further key limitation is that **the analysis conflates the precision effect with the benchmarking effect.** The shift in the historical UQ post-merger cannot be interpreted as a change in precision, since both the benchmarking and the precision effects are at play if results are estimated when SWW and SBW are replaced with the merged entity.[25]

Ofwat subsequently acknowledges this point in its submission and states that:

> this impact will be made up of both changes due to the reduction in precision of our models, but also by the relative efficiency of different water companies[26]

[21] See for example, Competition Commission (2007), '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, http://webarchive.nationalarchives.gov.uk/20130704020426/http://www.competition-commission.org.uk/assets/competitioncommission/docs/pdf/non-inquiry/rep_pub/reports/2007/fulltext/525.pdf; and Competition Commission (2012), 'South Staffordshire plc/ Cambridge Water plc merger inquiry (CC)- Appendices and Glossary', May, http://webarchive.nationalarchives.gov.uk/20140402141250/http://www.competition-commission.org.uk/assets/competitioncommission/docs/2012/south-staff-cambridge-water/final_appendices_and_glossary.pdf.

[22] Ibid.

[23] See Oxera (2015), 'Annex B Oxera - Precision', June, sections 4 and A4.

[24] Kumbhakar, S. and Horncastle, A. (2010), 'Improving the Econometric Precision of Regulatory Models', *Journal of Regulatory Economics*, **38**:2, October.

[25] In particular, the UQ benchmark depends on the residuals, which could be affected when more or less data is used in the modelling. For example, suppose that there is no merger but additional outturn data is available for modelling. The estimated residuals with additional data could change and so can the UQ benchmark. In this case, there is no statistical basis to conclude that the precision has decreased (or otherwise) because additional data is used in the modelling on the basis of the change in the UQ benchmark.

[26] Ofwat (2015), 'Ofwat's initial submission to the Competition and Markets Authority following the acquisition of Bournemouth Water Investments Limited by Pennon Group plc', June, p. 78.

Ofwat extends this point to argue that the precision impact can be separated from the rest, which would lead to a reduction in estimated precision of 0.21%.

However, **there is no statistical basis for the 'decomposition approach' used, which confounds changes in the cost function when SBW is dropped with changes in the precision of the models**. Moreover, simply dropping SBW is incorrect—the impact on precision should be examined with and without the merger (which is not the same as simply dropping SBW, as a new company is created through the merger and replaces SBW and SWW).

3.2 Ofwat's general approach

Under this approach, the CC calculated the modelled cost difference of all companies when the coefficient in each model was increased or decreased by one standard error. The same procedure was repeated using one fewer degree of freedom,[27] which is intended to capture the theoretical loss in an observation. Comparing the average deviations with and without one fewer degree of freedom would result in the relative change in precision when an observation is lost. It is worth noting that, in PR09, Ofwat used simple cross-sectional models with at most two explanatory variables.

The general approach suffers from the limitation that it does not consider the specifics of this merger, since it does not consider the data of the three companies (SBW, SWW and the merged company).

Indeed, some of the results are not plausible from an economic and operational standpoint and call into question the validity of these results. The **counterintuitive results are likely to be driven by the presence of squared terms and cross-products in the translog cost functions**.[28,29]

As discussed in the previous section, the general approach is inherently limited, since it does not consider the specifics of the merger. The correct application of bootstrapping is therefore a suitable alternative to the general approach. Moreover, given the significant issues with applying the general approach to the current complex models, the bootstrapping approach is more suitable in the current context than the general approach.

3.3 Ofwat's bootstrapping approach

Ofwat's use of bootstrapping[30] as a sensitivity to the results from the general approach[31] **is not consistent with the approach considered by the CC in**

[27] The degrees of freedom can be defined as the number of independent datapoints used to estimate the relationship between costs and cost drivers. These are equal to the sample size less the number of estimated parameters.
[28] For example, tables A30 and A31 in Ofwat (2015) show the results under the confidence interval and original approaches. In table A30, Ofwat shows total efficiency to the UQ28 when all coefficients are reduced by their respective standard errors. When all coefficients are lower, cost predictions are generally lower. Efficiency is therefore expected to decrease, while in this case the resultant total efficiency to the UQ becomes extremely high, as much as £2,111m (with the UQ becoming as low as 0.002%). Ofwat (2015), 'Ofwat's initial submission to the Competition and Markets Authority following the acquisition of Bournemouth Water Investments Limited by Pennon Group plc', June.
[29] Moreover, Ofwat's general approach presents a number of other inconsistencies and modelling issues. For example, the total deviation of adjusted modelled costs from TOTEX actuals should be benchmarked to the scenario-specific UQ. Amending the analysis on this basis seems to reduce Ofwat's confidence interval results from 3.8% to 0.3%, and the prediction results from 8.4% to 0.6%.
[30] Ofwat (2015), 'Ofwat's initial submission to the Competition and Markets Authority following the acquisition of Bournemouth Water Investments Limited by Pennon Group plc', June, pp. 88–91.
[31] Table A33 in Ofwat (2015) shows that the bootstrap estimate is 3%, and is compared with a general approach estimate of 3.8%. However, rounding these estimates consistently gives a larger gap (2.6% vs 3.8%). It is questionable that a gap greater than 1 percentage point can plausibly lead to stating that 'the numbers are very similar, which gives [us] confidence in the estimate of the general approach'. Ofwat (2015),

previous mergers, which, if applied consistently, shows that the bias in Ofwat's models reduces post-merger and indicates a potential improvement in precision.[32] The CC considered this approach in the Mid Kent Water–South East Water (MKW–SEW) case, and it has been used in Oxera (2015) in this case. Ofwat's results are different from Oxera's for the following reasons.

- In the MKW–SEW case, the CC assessed whether the estimated bias in the standard error of the coefficient on the cost driver was less than 25% of the standard deviation of the bootstrapped estimate. The 25% cut-off was an academically recommended threshold to identify if the bias in the standard error of the coefficient could be a problem. Ofwat has instead compared the ratio of bias with the standard derivation of the bootstrap estimate in the factual and counterfactual cases, without recourse to whether the bias is severe based on the recommended cut-off.[33] This amended bootstrap approach has no statistical basis.

- Oxera has estimated the bias in the standard error of the coefficient using an approach that is more consistent with that taken by the CC in the MKW–SEW inquiry and also used by us in previous inquiries. Ofwat has used a different approach to estimate the bias in the standard error.

3.4 Ofwat's counterarguments to some possible mitigating strategies are weak

Extending the timeframe of panel cost models leads to a benefit in precision.[34] It is possible to extend the water panel dataset using additional outturn data, since the 2013/14 and 2014/15 water data is already available and does not appear to present any differences in definition from that used at PR14.[35]

In relation to the use of random effects (RE) estimation when the panel dimensions lengthen, **there are several alternative robust efficiency models that overcome the specific limitations of the RE estimator**, and that could be considered by Ofwat going forward.[36] **In addition, we do not see any reason to believe that 'random effect models assume that relative efficiencies stay constant over the period modelled,'[37] unless one views firm heterogeneity as inefficiency, which is incorrect**. Inefficiency in Ofwat's models comes from the UQ of the residuals, and there is no formal model of inefficiency. In other words, by using the UQ benchmark in its models, the use of the RE estimator does not imply constant inefficiency over the modelled period.

Lastly, it is not clear why dropping some counterintuitive and insignificant cost drivers would not represent a valid mitigating strategy going forward, since it would increase the degrees of freedom and, in turn, the model precision, everything else being equal.

'Ofwat's initial submission to the Competition and Markets Authority following the acquisition of Bournemouth Water Investments Limited by Pennon Group plc', June, p. 91.

[32] See section 3.1.1 in Oxera (2015), 'Annex B Oxera - Precision', June.

[33] See Efron, B. (1982), *The Jackknife, the Bootstrap and other Resampling Plans*, Society for Industrial and Applied Mathematics.

[34] See Appendix A3 in Oxera (2015), 'Annex B Oxera - Precision', June.

[35] Using a number of diagnostic tests for extended models, Appendix 4 of Oxera (2015) shows that the results from these are comparable to those using data up to 2012/13. Oxera (2015), 'Annex B Oxera - Precision', June.

[36] These have been developed in the literature and used in regulatory settings. See discussions in section 3 of Oxera (2013), 'Recommendations on cost assessment approaches for RIIO-ED1', An independent submission by Oxera to Ofgem, February, https://www.ofgem.gov.uk/sites/default/files/docs/2013/05/recommendations_on_cost_assessment_approach_for_riio-ed1-%282%29_1.pdf.

[37] Ofwat (2015), 'Ofwat's initial submission to the Competition and Markets Authority following the acquisition of Bournemouth Water Investments Limited by Pennon Group plc', June, p. 114.

4 Conclusion

This response has provided a conceptual critique of Ofwat's initial submission on precision assessment. We have identified a number of issues with its analysis—for example:

- the specific approach departs from how the CC has previously assessed this issue and confounds changes in the cost function with changes in the precision of the models. The 'decomposition' approach is intended to overcome the issue, but has no statistical basis. Moreover, Oxera's analysis presented results from a number of important measures of precision used in the context of previous merger inquiries, such as R^2 and confidence widths, which show no substantial loss of precision;
- in the general approach, results are often implausible from an economic and operational standpoint, mainly due to the presence of squared terms and cross-products in the translog cost functions;
- Ofwat's application of bootstrapping is not consistent with that considered by the CC in previous mergers. Using the same comparison approach adopted in the MKW–SEW case, where the bias is assessed relative to a cut-off rule, shows a potential precision benefit.

The outcome of this review therefore aligns with the conclusion reached by Ofwat in its PR14 value of comparator analysis, where it stated that the loss of a water-only company would not result in it setting a less stringent efficiency challenge to compensate for any lack of precision in its models.[38] Furthermore, the review confirms Oxera's statement that there is no material impact on precision from the merger and thus there is no prejudice.[39]

In relation to potential future strategies to offset the loss in precision, extending the timeframe of panel cost models is an effective and feasible strategy going forward, since it leads to an increase in the sample size. The 2013/14 and 2014/15 water data is already available and does not appear to present any substantial differences in definition. Dropping counterintuitive and insignificant cost drivers is another valid mitigating strategy that can be used in order to increase the degrees of freedom.

In conclusion, Ofwat's analysis in its initial submission does not raise any issues that would lead us to alter our original conclusion. Based on our assessment following the approaches considered by the CC in previous inquiries, we view **that there is no material impact on precision from the merger and thus there is no prejudice**.

[38] Ofwat (2014), 'Final price control determination notice: annex 3 – benefits assessment of an uplift on the cost of capital', December, p. 8, https://www.ofwat.gov.uk/pricereview/pr14/det_pr20141212riskrewardbenefits.pdf.
[39] Oxera (2015), 'Annex B Oxera - Precision', June.

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Oxera response to Ofwat's initial submission on retail cost to serve

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Contents

Summary

In its initial submission assessing the impact of the merger between South West Water (SWW) and Bournemouth Water (SBW), Ofwat used two approaches to assess the impact on the retail cost to serve.[1]

Under a static approach, Ofwat has estimated a net benefit of between £5m and £21m (over five years), depending on whether benefits from the doubtful debt adjustments are considered. The corresponding estimates derived using Oxera's analysis are similar—a net benefit of between £5m and £17m (over five years), depending on whether benefits from the doubtful debt adjustments are considered.[2]

Under a forward-looking approach, with imposed convergence in cost performance and the use of an upper-quartile (UQ) benchmark, Ofwat's assessment provides a net benefit of £6m NPV over AMP7 (ten-year NPV). Oxera's analysis presents a benefit of about £21m NPV over 30 years (benefit of £13m over ten years).[3]

While we have some reservations about Ofwat's approaches, we note that **Ofwat agrees with our conclusion that the SWW–SBW merger will result in a benefit on retail cost to serve**.[4] In this case, the methodological differences did not result in a material difference in our conclusions. This is because, on unmetered costs, which is the more significant of the ACTS models in terms of cost base, the difference in outcomes between factual and counterfactual cases is similar to losing SBW, as considered by Ofwat.

Our main reservation with Ofwat's approach is that it simply quantifies the impact of losing SBW, while our approach considers the differences in the outcomes in the factual and counterfactual scenarios. To this extent, our approach is consistent with the Competition and Markets Authority's (CMA) issues statement and the CMA's merger guidance.[5,6] Our approach, at a conceptual level, is also consistent, in this regard, with how Ofwat has considered the impact of the merger on SIM and ODI.[7]

We have considered the impact of some of Ofwat's alternative assumptions in our analysis. These sensitivities result in broadly similar results to those reported in our initial submission. **We conclude that our results are robust to Ofwat's alternative assumptions.**

Ofwat has also considered a frontier benchmark under its forward-looking approach. To our knowledge, regulators typically acknowledge that the efficiency gap between a company's current cost performance and the industry best practice is only estimated, and there are limitations in assessing this gap such that it is impossible to measure with 100% accuracy (for example, due to data or

[1] See Ofwat (2015), 'Ofwat's initial submission to the Competition and Markets Authority following the acquisition of Bournemouth Water Investments Limited by Pennon Group plc', Appendix A3.4. Oxera reviewed two analysis files: a static analysis file (with bad debt) and a changes approach analysis file.
[2] See Oxera's analysis file, 'Annex D Oxera (Static Analysis)'; and Oxera (2015), 'Annex D Oxera – retail average cost to serve', June.
[3] See Oxera's analysis file, 'Annex D Oxera (Deterministic Analysis)'; and Oxera (2015), 'Annex D Oxera – retail average cost to serve', June.
[4] Only where Ofwat use the unprecedented assumption of a pure frontier benchmark does it find no benefit.
[5] Competition and Markets Authority (2015), 'Completed acquisition by Pennon Group plc of Bournemouth Water Investments Limited: Statement of Issues', July.
[6] Competition and Markets Authority (2014), 'Mergers: Guidance on the CMA's jurisdiction and procedure', January.
[7] See Appendices A6.4 and A6.5 of Ofwat (2015): 'Ofwat's initial submission to the Competition and Markets Authority following the acquisition of Bournemouth Water Investments Limited by Pennon Group plc', June.

measurement errors, limitations with any benchmarking approach, etc.). For this reason, Ofwat and other UK regulators have not considered a pure frontier benchmark for benchmarking purposes in the past. As such, we have not considered the impact of moving to a frontier benchmark in our analysis.

1 Introduction

In its initial submission assessing the impact of the SWW–SBW merger, Ofwat used two approaches to assess the impact on retail cost to serve.[8] While the results from Ofwat's analysis are directionally similar to those presented in our technical annex, we have identified some methodological issues with Ofwat's approach. These are discussed in this report, which is structured as follows.

- Section 2 of this report describes Ofwat's static and forward-looking approaches.
- We present our critique of Ofwat's analysis in section 3.
- Section 4 concludes.

[8] See Ofwat (2015), 'Ofwat's initial submission to the Competition and Markets Authority following the acquisition of Bournemouth Water Investments Limited by Pennon Group plc', Appendix A3.4. Oxera reviewed two analysis files: a static analysis file (with bad debt) and a changes approach analysis file.

2 Overview of Ofwat's analysis

Ofwat used two approaches to assess the impact of the SWW–SBW merger on the retail cost to serve.

A **static approach** that estimates the impact on the ACTS and allowed revenue of losing SBW, using the PR14 ACTS framework. In this approach, the impact over AMP6 is assessed assuming that the merger happens in the course of PR14. Ofwat has considered the impact of the benefit with and without the impact on the sector bad debt allowances. The estimated impacts under its static approach are directionally consistent with Oxera's.[9,10] A comparison of Ofwat's and Oxera's static estimates are presented in the table below.

Figure 2.1 Summary of static analysis: Ofwat and Oxera

Static analysis: with or without doubtful debt adjustments	Ofwat quantified impact (2015–20)	Oxera quantified impact (2015–20)
Without doubtful debt	Net benefit of £5m	Net benefit of £5m
With doubtful debt adjustments	Net benefit of £21m	Net benefit of £17m

Note: Some differences remain due to specific application of the static approach—for example, differences in the econometric models used to estimate doubtful debts.

Source: Oxera and Ofwat.

Given that the results under the static approach are similar, we do not review it further in this report.

Ofwat's **forward-looking approach** assesses the future impact of the merger based on a probabilistic changes approach and an UQ benchmark.[11] The main elements of Ofwat's forward-looking approach are as follows.

- Rank movement probabilities, used to compute the probabilities that SWW and SBW would have been UQ companies at future price reviews. Ofwat has derived the probabilities using historical OPEX ranking.
- A glide path used to allow companies to reach their allowed cost to serve within three years, as set at PR14.
- Convergence in cost performance. Ofwat has assumed that companies would converge to the UQ benchmark by 2025. While we have not reviewed the mechanics of Ofwat's application of convergence, we note that it is different from the application it indicated in its merger consultation report, upon which the assumptions in our technical annex are based.[12]
- Scenarios are defined based on the position of SWW and SBW relative to the UQ to assess the impact of the merger. As Ofwat's analysis is not merger-specific, the monetary effect of the merger always depends on the position of SBW only.

[9] See Oxera's analysis file, 'Annex D Oxera (Static Analysis)'; and Oxera (2015), 'Annex D Oxera – retail average cost to serve', June.
[10] Note that we have not seen all the relevant analysis files to cross-check Ofwat's static analysis.
[11] Ofwat has also considered a frontier benchmark under this approach. To our knowledge, a frontier benchmark has not been considered by Ofwat or other UK regulators for benchmarking purposes in the past.
[12] Specifically, Ofwat noted that 'companies would eliminate 75% of the difference between their cost and that of the most efficient company within 20 years.' See Ofwat (2015), 'Consultation on Ofwat's approach to future mergers and statement of method', p. 71.

Ofwat derives the impact separately for costs incurred in serving measured and unmeasured customers. These estimates are then summed to give the total impact.

Ofwat's assessment under its forward-looking approach provides a net benefit of £6m NPV over AMP7 (ten-year NPV). Oxera's analysis presents a benefit of about £21m NPV over 30 years (benefit of £13m over ten years).[13]

While we have some reservations about Ofwat's approaches, we note that Ofwat agrees with our conclusion that the SWW–SBW merger will result in a benefit on retail cost to serve.[14] In this case, the methodological differences did not result in a material difference in our conclusions. This is because, on unmetered costs, which is the more significant of the ACTS models in terms of cost base, the difference in outcomes between factual and counterfactual cases is similar to losing SBW, as considered by Ofwat.

Our main reservation with Ofwat's approach is that it simply quantifies the impact of losing SBW, while our approach considers the differences in the outcomes in the factual and counterfactual scenarios. To this extent, our approach is consistent with the CMA's issues statement and the CMA's merger guidance.[15, 16] Our approach, at a conceptual level, is also consistent, in this regard, with how Ofwat has considered the impact of the merger on SIM and ODI.[17]

[13] See Oxera's analysis file, 'Annex D Oxera (Deterministic Analysis)'; and Oxera (2015), 'Annex D Oxera – retail average cost to serve', June.
[14] Only where Ofwat uses the unprecedented assumption of a pure frontier benchmark does it find no benefit.
[15] Competition and Markets Authority (2015), 'Completed acquisition by Pennon Group plc of Bournemouth Water Investments Limited: Statement of Issues', July.
[16] Competition and Markets Authority (2014), 'Mergers: Guidance on the CMA's jurisdiction and procedure', January.
[17] See Appendices A6.4 and A6.5 of Ofwat (2015), 'Ofwat's initial submission to the Competition and Markets Authority following the acquisition of Bournemouth Water Investments Limited by Pennon Group plc', June.

3 Review of Ofwat's forward-looking analysis

Below we detail specific issues that we have identified with Ofwat's forward-looking analysis. In our view, these issues question the robustness of Ofwat's approach. We note that, in this case, the methodological differences did not result in a material difference in our conclusions, as on unmetered costs, which is the more significant of the ACTS models in terms of cost base, the difference in outcomes between factual and counterfactual cases is similar to losing SBW alone in the counterfactual case.

We have also tested the sensitivity of our approach to some of the alternative assumptions suggested by Ofwat's approach. We conclude that our approach is robust to changes in those assumptions.

3.1 Ofwat's analysis is not merger-specific

Similar to its analysis on the wholesale cost benchmark, Ofwat has defined six scenarios based on the rankings of SWW, SBW and the merged entity relative to the cost to serve benchmark. However, the direction of the impact in each scenario depends on SBW's position only.[18] The scenarios[19] are extraneous to its analysis, as it has simply considered the probability of SBW being in the UQ or otherwise in its analysis.[20]

As in its wholesale analysis, Ofwat's assignment of impacts to the scenarios appears inconsistent with the description of those scenarios. For example, in scenario 4 one of the merging entities is inefficient, but the merged entity is efficient. This appears to suggest that the merger results in the loss of an inefficient company from the industry and should result in a benefit. Yet, the impact assigned by Ofwat to this scenario is calculated based on removing from the industry *the most efficient* operator (resulting in a detriment).

In our technical annex, we quantified the impact of losing SWW and SBW in the counterfactual case (pre-merger industry) as well as the impact of losing the merged entity in the factual (post-merger) case.[21] The difference in these impacts is used to estimate the effect of the SWW–SBW merger.

Ofwat's analysis is not merger-specific as it does not consider the outcome in the post-merger situation, and in particular the quality of the merged entity as a comparator in the post-merger industry.

3.2 Inconsistency in the application of cost convergence

In its initial submission, Ofwat states on convergence that:

[18] This is not straightforward to interpret because in each case it is the impact of removing a company other than SBW from the industry. For example, in the case of metered costs, the impact assigned to scenarios 1, 4 and 5 is obtained by removing Portsmouth, and the impact assigned to scenarios 2, 3 and 6 from removing United Utilities.
[19] We note that the number of scenarios should be extended to capture all possibilities. See our discussion on this point in section 3 of our response on Ofwat's wholesale benchmark analysis: Oxera (2015), 'Oxera response to Ofwat's initial submission on wholesale benchmark', July.
[20] To see that the scenarios play no role in the calculation, the probabilities of scenarios 2 and 4 may be adjusted to any level between 0 and 1, as long as the probabilities of scenarios 3 and 5 adjust accordingly (as these are mutually exclusive scenarios), and the results remain unchanged. If the definition of scenarios were to be completed such that there were 8 in total, this irrelevance of scenario probabilities would also apply to scenarios 1 and 6.
[21] We note that in the factual case where there are 17 companies, the shift in the benchmark where we lose an UQ or a non-UQ company is different from that in the 18-company case. To even out this issue, the value of the merged entity could be assessed using the monetary shifts computed in the counterfactual case.

> Companies whose cost to serve is above the upper quartile, converge to upper quartile by 2025.[22]

Given time limitations, we have not reviewed the mechanics behind the implementation of the approach.[23] We note, however, that a number of companies have CTS above the UQ value by 2024/25 in Ofwat's analysis.

Oxera's application of convergence is based on the information in Ofwat's merger consultation report that 'companies would eliminate 75% of the difference between their cost and that of the most efficient company within 20 years.'[24] **We note that our result is robust to the alternative assumption on convergence considered by Ofwat.**

3.3 Reliance on OPEX in defining the rank movements

Ofwat's approach relies on rank movement probabilities derived from 2000–09 year-on-year OPEX ranks that were also used (together with CAPEX ranks) in the derivation of rank movement probabilities for its wholesale benchmark model.

In our technical annex, we have also adopted the modelled changes approach but based it on companies' CTS data for metered and unmetered customers over the period 2013/14 to 2019/20. A transitions probabilistic approach was also implemented on the CTS data, but owing to limited data in this case, the resultant probabilities were deemed less reliable. In addition, the results under another alternative approach, the permutations method, were similar to those under the changes method.

Nevertheless, we have tested the sensitivity of our results to the use of OPEX rankings instead of the CTS rankings. The results indicate that our approach is robust to this sensitivity.

3.4 Ofwat's simplified framework cannot consider synergy savings

We note that Ofwat's current analysis framework does not allow the impact of synergies to be determined, as it does not consider the post-merger 'factual' case. As noted in our technical annex, the merger-specific synergy savings have the potential to set a more challenging benchmark on the rest of the industry in the post-merger case and benefit Ofwat's comparative regime.

3.5 Summary

We remain of the view that the framework we use for assessing the difference in the industry allowance in the factual and counterfactual scenarios constitutes a more appropriate method to assess the impact of this merger. The approach is also consistent with the CMA's issues statement, the CMA's merger guidance and Ofwat's merger consultation report. Such a framework can also capture directly the impact of synergies on the benchmark.

[22] See Ofwat (2015), 'Ofwat's initial submission to the Competition and Markets Authority following the acquisition of Bournemouth Water Investments Limited by Pennon Group plc', p. 54.
[23] We note that one of the relevant spreadsheets was missing from the list of files sent by Ofwat for our review.
[24] See Ofwat (2015), 'Consultation on Ofwat's approach to future mergers and statement of method', p. 71.

4 Conclusion

Having reviewed Ofwat's approach, we consider that our approach is more appropriate for estimating the impact of the SWW–SBW merger on the retail benchmark. This conclusion is based largely on the merger-specificity of our approach, while Ofwat's approach simply quantifies the impact of losing SBW in the pre-merger case. Our framework is also consistent with the CMA's issues statement and the CMA's merger guidance, and considers the impact of the synergy savings on the benchmark directly in the analysis.

We also note that despite methodological differences, in this case, the results from our approach and Ofwat's were broadly similar. This is because, on unmetered costs, which is the more significant of the ACTS models in terms of cost base, the difference in outcomes between factual and counterfactual cases is similar to losing SBW.

We have also considered other features of Ofwat's approach and the sensitivity of our results to some of the alternative assumptions presented by Ofwat. These include the choice of OPEX ranking instead of companies' retail cost to serve rankings for the computation of rank movement probabilities, and the alternative convergence assumption considered by Ofwat.

We conclude that our results are robust to Ofwat's alternative assumptions—i.e. that the merger of SWW and SBW results in a more challenging benchmark that will benefit the wider comparative efficiency regime on household retail, and thereby customers. This result holds even without considering any merger-specific savings. To the extent that the expected merger synergies would be included, the comparative benefit could be more significant.

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