CMA
Competition & Markets Authority

Pennon Group and Bournemouth Water

A report on the completed acquisition by Pennon Group plc of Bournemouth Water Investments Limited

5 November 2015

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Summary

1. On 8 June 2015 the Competition and Markets Authority (CMA) referred the completed acquisition by Pennon Group plc (Pennon) of Sembcorp Bournemouth Water Investments Limited (BWIL) for a phase 2 investigation and report. The reference was made under section 32(b) of the Water Industry Act 1991 (WIA).

2. If the CMA finds that a water merger has taken place we must decide whether the merger has prejudiced, or may be expected to prejudice, the ability of the Water Services Regulation Authority (Ofwat), in carrying out its functions by virtue of the WIA, to make comparisons between different water enterprises.

3. Pennon owns South West Water Limited (SWW). BWIL is the parent company of Bournemouth Water Limited (BW). Both SWW and BW are water enterprises operating in the South West of England and southern England respectively. SWW provides water and sewerage services whilst BW supplies water services only. In the year to 31 March 2015 SWW had a turnover of approximately £518 million, of which almost all came from regulated activities. BW had a turnover of approximately £46 million last calendar year of which around £45 million came from regulated activities.

4. Under section 33 of the WIA, the CMA is required to make a phase 2 merger reference unless the value of the turnover of the water enterprise being taken over does not exceed or, as the case may be, would not exceed £10 million, or if the only water enterprises already belonging to the acquirer are enterprises each of which has a turnover the value of which does not exceed or would not exceed £10 million. On 16 April 2015 Pennon acquired the entire issued share capital of BWIL. We consider that a water merger has taken place.

5. Before the merger there were 18 water companies in England and Wales and so the merger would reduce that number to 17. In 2014/15 the combined turnover of water companies in England and Wales was approximately £5.8 billion. When separated by wholesale and retail activities, the majority of activity across the industry – around 90% – is at the wholesale level. Water is a highly regulated industry. Of interest to us in this inquiry is Ofwat's regulation of price controls and setting of performance targets regarding water services. The last price control determination (which also set various performance targets) – known as PR14 – was in 2014 which set regulatory outcomes for 2015 to 2020. Therefore, the impact of the merger on the setting of price controls and performance targets will not be felt until 2020.

6. Ofwat makes comparisons between water companies for several purposes. These purposes are to:

   - set wholesale price controls;
   - set retail price controls (for households and non-households);
   - monitor and set performance targets for wholesale quality of service (through outcome delivery incentives (ODIs));
   - monitor and incentivise improvement in retail quality of service (through the service incentive mechanism (SIM)); and
   - spread best practice and undertake monitoring and enforcement activities.

7. We have considered how the merger may impact on Ofwat's ability to make comparisons between water enterprises in each of these areas.

8. We note that Ofwat does not oppose this merger provided that the CMA could secure what Ofwat viewed as appropriate remedies. Ofwat submitted to us that the merger would lead to a prejudicial impact on its ability to make comparisons between water enterprises but in its view that prejudice is not so great as to lead it to oppose the merger. However, in the absence of a finding of prejudice to Ofwat's ability to make comparisons between water enterprises the CMA is unable to consider the question of remedies.

9. We have taken a two-part approach to our assessment. First, we assessed the impact of the merger on Ofwat's ability to make comparisons between water companies and whether that impact is likely to be adverse. Second, we considered whether any adverse impact either individually or in combination with any other adverse impact(s) is significant enough to amount to prejudice. The level of any customer detriment is only one factor in our assessment of whether any adverse impact is significant enough to amount to prejudice.

10. We considered what would be the situation that would prevail in the absence of the merger, which we refer to as the counterfactual situation, and against which we assessed the effect of the merger. We found that this would be the regulated water industry with the pre-merger number of comparators (18), including SWW and BW operating independently.

11. When examining the setting of wholesale price controls, ODI and SIM we have used both a 'static' approach and a 'forward-looking' approach in our analyses. In examining the household retail benchmark we have only used a 'forward-looking' approach, due to the changes Ofwat intends to make to setting retail price controls. The static approach considers the impact of the

merger using the regulatory framework that Ofwat used in PR14 and, where appropriate, the rankings of SWW and BW have been used to determine a new ranking for the merged entity. The forward-looking approach takes account of information relevant to how the merger parties may perform in future price determinations – which could be changes in their comparative rankings (based either on probabilities of past ranking changes or current business plan forecasts) or known modifications in Ofwat's price determination approach. For non-household retail price controls, given the upcoming reforms and uncertainty surrounding future regulation in this area, we have not undertaken an in-depth merger assessment.

12. Because the price controls and targets from PR14 have been set until 2020, the static approach, when it has been used, reveals a purely hypothetical impact.[1] Nevertheless it provides a useful cross-check and comparison with the results of the forward-looking analysis, on which we have placed greater weight. This is especially important given that across all of the ways in which Ofwat uses comparators, at least one of SWW or BW were ranked highly in PR14 (and in the case of wholesale price setting, BW and SWW were the top two ranked water companies in terms of wholesale cost efficiency).

13. Further, wherever appropriate we have used a mix of quantitative and qualitative evidence in our assessment. We have used quantitative evidence in all of our analysis apart from assessing the merger impact on comparisons for ongoing monitoring, enforcement and to identify and spread best practice, where we have relied on qualitative evidence.

14. We have looked at each of the purposes identified in paragraph 6 in turn.

Setting wholesale price controls

15. Ofwat makes extensive use of comparisons between water companies in setting wholesale price controls. At PR14, Ofwat used econometric models to assess the relative performance of the 18 water companies in order to estimate wholesale cost efficiency and to set efficiency challenge targets for each water company. In this way Ofwat sets wholesale cost allowances for each company.

16. Ofwat used econometric modelling as part of the process of setting wholesale price controls to estimate each water company's relative wholesale cost efficiency level in order to determine a level of efficiency performance for each water company. At PR14 the efficiency benchmark level was set at the upper

[1] Apart from the non-household retail price control which was set until 2017.

quartile (UQ) level. It is by comparison with this benchmark level that other water companies' relative efficiencies are calculated. These relative efficiencies are then used in setting water companies' expenditure allowances for the next five years.

17. We considered whether the merger may adversely impact on Ofwat's ability to make comparisons between water companies in setting wholesale price controls in two ways. The first is that the merger may result in a reduction in precision of Ofwat's modelling in that it no longer allows Ofwat to make as effective comparisons between water companies' efficiency levels. We call this the precision effect. The second is that the merger may lead to the loss of a particularly valuable comparator which harms Ofwat's ability to set a demanding efficiency challenge for the rest of the industry. In terms of Ofwat's formal cost modelling, the loss of a valuable comparator is likely to lead to the lowering of the efficiency benchmark which Ofwat uses to incentivise industry performance. We call this the benchmark effect.

18. Ofwat told us that if the precision in its overall econometric estimate was reduced, this might lead to water companies challenging the model and requesting a specific adjustment to their cost allowance. Ofwat would therefore be more susceptible to accepting cost adjustments that made price determinations less demanding.

The precision effect

19. There are two main ways in which the merger may have an adverse impact on the precision of Ofwat's econometric modelling.

20. The first is the loss of independent data points for statistical analysis, in this case going from 18 water companies to 17. This results in an inherent loss in precision. A standard principle of statistical theory is that fewer data points will lead to less precise econometric estimates.

21. The second is that SWW or BW may have specific characteristics which make them particularly useful for Ofwat in modelling wholesale costs. If BW's or SWW's data provide useful variation in certain variables which helps Ofwat to identify key determinants of wholesale costs across companies, and some of this variation is lost as a result of the merger, this may result in a loss of precision in Ofwat's models. On the other hand, if the merger does not lead to a significant loss in variation, or if the variation is driven by company-specific factors which are less important in estimating cost drivers for the industry as a whole, then we consider that the merger is less likely to lead to a significant loss in precision.

22. We have looked at four main methods to estimate the statistical loss in precision:

- The General Approach, which measures the loss in precision related to a loss of data points. This approach does not take account of the specific parties to the merger.
- The Specific Approach, which measures the loss in precision by re-estimating Ofwat's models under a simulation of the specific merged entity, thereby taking account of the parties to the merger.
- Bootstrapping, which measures the loss of precision by using Ofwat's models to estimate outcomes under different random simulations of the current data set.
- A Qualitative Approach which looks at the theoretical statistical reduction in precision that may arise from the loss of BW's independent observations.

23. In measuring any reduction in precision, we are seeking to identify the scale of the change in the accuracy of Ofwat's models. The scale of any loss in precision that we identify under these approaches does not have a direct and measurable effect on the outcome of Ofwat's comparative regulation.

24. In our findings we have not placed weight on results of the Specific Approach because of the econometric limitations discussed in this report. Likewise, because of the technical econometric concerns that we have identified on bootstrapping we have not relied on those results.

25. With regard to the General Approach Pennon submitted that precision around the UQ estimate would worsen by 2.9% to 8.4% across three of Ofwat's input models but be more precise in one of those models (by 20%). Ofwat estimated that the merger would lead to a reduction in precision of 7.5% around the overall wholesale cost estimate and a 4.7% reduction in the precision of the UQ benchmark. For the reasons given in this report we consider that these estimates have their limitations.

26. We also undertook our own analysis, recognising that it too has limitations. That analysis found that the merger is likely to lead to a reduction in statistical precision. Although there are analytical difficulties in quantifying the effect, we consider that an estimate of around a 4% diminution in precision is the most reasonable estimate available to us. This estimate is based on a 0.18 percentage point expansion in the error band around Ofwat's econometric totex estimate from 4.90% to 5.08%. Therefore, we consider that under the General Approach, the merger has an adverse impact on the precision of Ofwat's econometric wholesale benchmarking models. The level of additional

imprecision as a result of the merger estimated according to our General Approach is around £350,000 per year for the average water company (or £6.3 million per year across the industry as a whole) in Ofwat's overall econometric wholesale cost estimate. The increased uncertainty around the cost estimate could lead to predicted costs being either higher or lower following the merger, so this measure should not be interpreted as a direct estimate of consumer detriment from loss of precision. To set this in some context, we note that revenues attributable to wholesale activity accounts for approximately £5.2 billion per year in England and Wales.

27. We examined BW's characteristics under the Qualitative Approach. The evidence indicated that although the merger will lead to some loss in variation in Ofwat's data in four variables (ie some adverse impact), any resulting loss in precision in Ofwat's overall cost model is likely to be small.

28. We recognise that Ofwat's approach to wholesale cost benchmarking will continue to evolve in subsequent price controls. It may develop new cost models, and could choose to use different efficiency benchmarks in the future. However, in the absence of certainty over Ofwat's future approach, we consider that looking at the impact of the merger on Ofwat's current approach to wholesale benchmarking is the most appropriate basis for our analysis. But in the event that Ofwat did want to set a more stringent benchmark in the future, Ofwat told us that the decision would be based on a range of factors, of which precision of the models was only one.

29. We consider that the evidence suggests that the increased imprecision in Ofwat's models is unlikely to affect either Ofwat's ability to set stretching cost benchmarks or its susceptibility to water companies' requests to make adjustments to their cost allowance. Although we consider that the merger is likely to result in some adverse impact we do not consider this adverse impact to be significant.

The benchmark effect

30. At PR14 BW and SWW were ranked first and second respectively in Ofwat's wholesale cost efficiency rankings. We explored evidence as to whether BW or SWW can be expected to remain in the UQ group of water companies at the next price review.

31. Under the static approach we found that the merger results in a 0.654 percentage point worsening in the industry UQ efficiency target, relative to the pre-merger level.

32. Under the forward-looking approach our analyses of the benchmarking effect show that the results are sensitive to the assumptions of starting rankings of SWW and BW in the analysis. We received submissions from Pennon that business plan forecasts used by Ofwat in PR14 provided the best indication of the future rankings of water companies. Ofwat, by contrast, submitted that historical rankings based on operating expenditure and capital expenditure data provided the better indication of how rankings might change in the future. Therefore, a key question for us has been whether rankings based on business plan forecasts, historical rankings changes or a third method to mitigate the risk of business plans being an inaccurate predictor of future rankings by applying the changes probabilities should form the basis of our analysis. We carefully considered the evidence on this. We were persuaded by the evidence of the impact of Ofwat's supply-demand balance model on BW's future efficiency ranking (which meant that BW would be ranked outside of the UQ). In the circumstances of this inquiry we consider it appropriate to take account of that effect, which led us to place considerable weight on business plan forecasts.

33. Of the analytical options available to us, our preference was to use business plans with a changes probability matrix applied to it, for the reasons set out in the report. Under this method our analysis shows that the merger is likely to lead to an adverse impact on the UQ benchmark. Although any change in the future UQ threshold is inherently uncertain, our analysis indicated that the expected adverse impact on the benchmark is equivalent to a customer detriment of around £9 million over 25 years (in NPV terms). We considered this adverse impact to be small.

34. We have also applied some weight to the results of the business plan rankings. It showed no adverse impact resulting from the merger.

35. We consider that neither of the above methods reveals the true impact of the merger, which is likely to lie somewhere between the two. That is, an impact that is either not adverse or adverse but small.

36. Taking the precision and benchmarking effects together we therefore have concluded that the merger is likely to result in some adverse impact on the setting of wholesale price controls but we do not consider that the adverse impact is significant.

Setting retail price controls

37. For retail price controls in PR14 Ofwat has used an average cost to serve (ACTS) threshold to set retail price controls separately for both metered and

non-metered households. The ACTS was based on benchmarking analysis across all the water companies.

38. Ofwat told us that it was unlikely to use an ACTS measure in the next price determination but would rather replace it with an efficient cost to serve (CTS) target (for example, a UQ or at the frontier). However, the importance of comparisons remains irrespective of where Ofwat choses to set the benchmark.

39. A merger is able to change the industry ACTS – or an efficient CTS measure – and as such lead to a different benchmark being set. In PR14, for serving metered household customers SWW was ranked third and BW 11th, and for unmetered customers BW was ranked 12th and SWW 15th. Both Pennon and Ofwat submitted that the merger would not result in any adverse impact on Ofwat's ability to set a demanding benchmark.

40. We undertook our analysis using a range of assumptions on how the current poorer performing water companies are likely to converge to the performance levels of the top performers. We found that the merger is likely to result in a more stringent price control (that will benefit customers). We therefore concluded that the merger is unlikely to result in an adverse impact on Ofwat's ability to set household retail price controls.

41. We also considered whether the merger might affect the precision of Ofwat's retail benchmark. Following the merger, the threshold would be based on a CTS measure across 17 rather than 18 water companies, and as a result we would expect the variance around the threshold to increase. We consider that the reduction in any precision in the benchmarks is mainly characterised by how much more susceptible 17 data points are to random error compared with 18 data points. We consider that this impact does not have a material effect on the precision of a CTS threshold.

Outcome delivery incentives

42. At PR14 water companies developed a set of outcomes that reflected what their customers needed, wanted and could afford (based on customer surveys and input from each water company's customer challenge group). These outcomes would then be the subject of performance commitments (PCs) and ODIs, which could be either financial or reputational. Since ODIs were based on what each water company's customers want in terms of performance improvements, they are bespoke to each company with relatively few common ODIs across water companies.

43. At PR14 Ofwat carried out a comparative analysis on the ODIs and PCs that were most common across the industry. Ofwat told us that it used comparative assessment to identify UQ performance targets for three ODIs in regulating the provision of water:

- the duration of supply interruptions;
- the number of contacts from customers regarding water quality; and
- compliance with DWI (Drinking Water Inspectorate) water quality standards (known as 'mean zonal compliance').

44. We have therefore focused our analysis on these three ODIs which we call the common ODIs.

45. A merger will bring two water companies that previously had separate management, under common management. This will lead to two water companies that previously reported each of their ODIs separately, reporting the same ODIs on a combined basis, which could affect the outcome of the ODI benchmarking by changing the benchmarks, and as such may lead to water companies receiving a less demanding determination, relative to the counterfactual case in which SWW and BW do not merge.

46. Pennon submitted that it was not appropriate to attempt to quantify the impact of a merger on the ODI benchmarks. In the circumstances of this inquiry, we are of the view that quantification is appropriate. Ofwat has chosen to set the benchmark at the UQ threshold for the common ODIs and we consider it appropriate to quantify any impact in order to aid our assessment on whether the impact of the merger on Ofwat's ability to make comparisons is, or may be expected to be, adverse and significant enough to amount to prejudice.

47. Our analysis did not find any adverse impact resulting from the merger on mean zonal compliance. Although both BW and SWW were in the UQ in mean zonal compliance at PR14, all water companies achieved very similar average scores between 2011/12 and 2013/14. As a result the merger is unlikely to lead to any effect on the benchmark.

48. We analysed the remaining two ODIs using two separate assumptions on convergence in performance.

49. Ofwat submitted that the impact on ODIs beyond 2025 was too uncertain to model because of uncertain rates of convergence and subsequent expected future rankings, and because of uncertainty over what the future threshold level will be. We agreed. Therefore, our analysis has been restricted to the next price determination period (2020 to 2025).

50. BW is currently a UQ comparator in these two ODIs (whereas SWW is not). It follows that under the static approach we found that for both ODIs the merger would result in a loss of a UQ comparator. For contacts from customers regarding water quality the UQ benchmark would worsen from 1.23 contacts per 1,000 population to 1.53 contacts per 1,000 population. For duration of water supply interruptions the merger would worsen the UQ benchmark from 12.3 minutes to 12.6 minutes per property served.

51. Under the forward-looking approach we allowed for some convergence in performance of the bottom-performing company closing 35% of the gap to the UQ by 2020 for duration of water supply interruptions and closing 50% of the gap for contacts from customers regarding water quality. Our analyses suggested that the scale of the combined potential detriment is around £15 million to £23 million in total (over five years).

52. We note that SWW and BW will continue to report on their ODI performance separately for the remainder of the PR14 period. Although Ofwat is concerned that BW and SWW will not be fully independent after integration, we nonetheless consider that Ofwat would not fully lose the value of BW as a separate comparator for PR19 (which is the period during which we have sought to quantify the effect).

53. We have found that the operational causes of contacts from customers regarding water quality and duration of supply interruptions are, at least in part, related to the performance of the existing water assets and local operational management, and therefore separate reporting will be likely to result in Ofwat continuing to receive data which is of value as a comparator. We concluded that the merger could be expected to have an adverse impact with respect to the setting of ODI targets. However, given the mitigating factors above, we were not persuaded that the adverse impact was likely to be significant.

Service incentive mechanism

54. The SIM is designed to improve retail quality of service by rewarding or penalising water companies based on their overall performance relative to other water companies.

55. Comparisons between water companies are therefore critical to the operation of the SIM. A merger will lead to two water companies that previously reported their SIM scores separately, reporting a single combined SIM score. This will reduce the number of data points available for comparisons and, in most instances, will lead to a change in the dispersion of results across the industry

and as such a change in the standard deviation (on which the reward and penalty system is based).

56. Ofwat assumed a high degree of convergence in performance after 2020 and so assumed in its submissions that the SIM would be replaced after 2025. We have therefore not made any analysis involving time periods after then.

57. BW has been a consistently good performer under the SIM. Ofwat submitted that BW had performed well on the SIM since 2011/12 whereas over this period SWW had been ranked below the UQ.

58. Our analysis found that by combining BW and SWW into a single entity, based on the static approach, the merger would result in the removal of a high-performing company with a resultant reduction in industry penalties of around £6 million over three years (based on the existing schedule of rewards and penalties), implying a worse outcome for customers.

59. However, based on the forward looking approach, our analysis has found that there has been a considerable level of convergence in SIM scores over recent years. Taking account of expected future convergence (and allowing some time for integration of SWW and BW to take place) we expect that the merger will lead to a reduction in industry penalties of £2.8 million over eight years, implying a worse outcome for customers. The sensitivity analysis that we applied showed the merger's impact could range from a reduction in penalties of around £980,000 to £3.8 million over the period to 2025. We therefore concluded that the merger could be expected to have an adverse impact regarding the SIM. However, we considered this adverse impact to be small.

Spreading best practice

60. In addition to setting price controls and performance targets, Ofwat also uses comparisons between water companies in informal, qualitative terms. Ofwat provided a number of examples of how it uses comparisons to spread best practice. It told us that it does so in three areas:

- **Ongoing monitoring**: a qualitative assessment of how water companies are performing in the context of Ofwat's duties including financial performance and resilience of systems and services.

- **Enforcement**: where Ofwat can draw on performance within the industry as support in addressing poor performance against regulatory requirements.

- **Spreading best practice**: the use of reviews of individual company plans and activities, in particular high-performing water companies, to propose new approaches to regulation across the industry.

61. We have examined whether, by reducing the number of comparators available to Ofwat (and hence potentially reducing the availability of examples of best practice upon which Ofwat can draw and/or company-specific factors that generate best practice), the merger might reduce Ofwat's ability to identify and spread best practice across the industry or its ability to monitor performance or enforce regulatory provisions.

62. During the course of our inquiry we have heard about a number of areas where BW or SWW have been identified as being at the frontier of industry best practice. For example, BW's customer relationship management and SWW's customer research.

63. We considered that, as BW is a small water-only company (WoC) facing relatively unique circumstances in its local market, the ability of other, generally significantly larger, water companies to apply lessons learned from it in their own areas is fairly limited. We note that Ofwat identified examples of where it was able to use good practice from BW in providing incentives to other small companies to provide high-quality information.

64. We also noted that BW and SWW will continue to report separately, at least during the PR14 period, and so will continue to be available as separate comparators until 2020.

65. In addition we found:

- the spreading of operational best practice involves a number of methods of which the use of comparators is only one; and

- any best practice specific to small water companies will impact only a very small proportion of the overall industry.

66. We therefore concluded that the loss of BW as an independently owned comparator, and the consequent reduction in the number of independently owned comparators from 18 to 17, would not result in an adverse impact regarding Ofwat's ability to encourage good practice or assess qualitative aspects of submissions made by water companies during future price reviews.

67. On ongoing monitoring and enforcement, we considered that the evidence did not relate to the impact of the loss of the merger parties as comparators. We concluded therefore that the merger would not adversely impact Ofwat's ability to monitor performance or enforce regulatory provisions.

68. Overall, we concluded that the adverse impacts that we have identified in our inquiry are not significant enough, either individually or in combination, to amount to prejudice to Ofwat's ability to make comparisons between water enterprises under the Enterprise Act 2002 (the Act). We therefore concluded that the merger between Pennon and BWIL has not prejudiced, and may not be expected to prejudice, the ability of Ofwat in carrying out its functions by virtue of the WIA to make comparisons between different water enterprises.

Findings

1. The reference

1.1 On 8 June 2015 the CMA referred the completed acquisition by Pennon of BWIL for a phase 2 investigation and report.[2] The reference was made under section 32(b) of the WIA. Our terms of reference are set out in Appendix A.

1.2 If we find that a water merger has taken place we must decide whether the merger has prejudiced, or may be expected to prejudice, the ability of Ofwat, in carrying out its functions by virtue of the WIA, to make comparisons between different water enterprises. We are required to publish our final report by 22 November 2015.

1.3 This document, together with the appendices, constitutes our findings. Further information, including our statement of issues, non-confidential versions of submissions from the merger parties, Ofwat and summaries of hearings with third parties can be found on our website.

2. Industry background

2.1 The industry of relevance to this merger inquiry is the provision of water services in England and Wales. There are separate regulatory regimes in Scotland and Northern Ireland. This section discusses the structure of the water industry in England and Wales and the key aspects of how they operate.

2.2 In England and Wales there are currently 18 companies providing water services, comprising ten regional water and sewerage companies (WaSCs) and eight water only companies (WoCs). Throughout this report we refer to WaSCs and WoCs collectively as 'water companies'.[3] The ten WaSCs range in size from Thames Water, with a water regulatory capital value (RCV)[4] of £5 billion, to Southern Water, with a water RCV of £751 million. Among the WoCs, South East Water and Affinity Water are of a comparable size to the smaller WaSCs. The total water-only RCV of the water companies in England and Wales is £27 billion.

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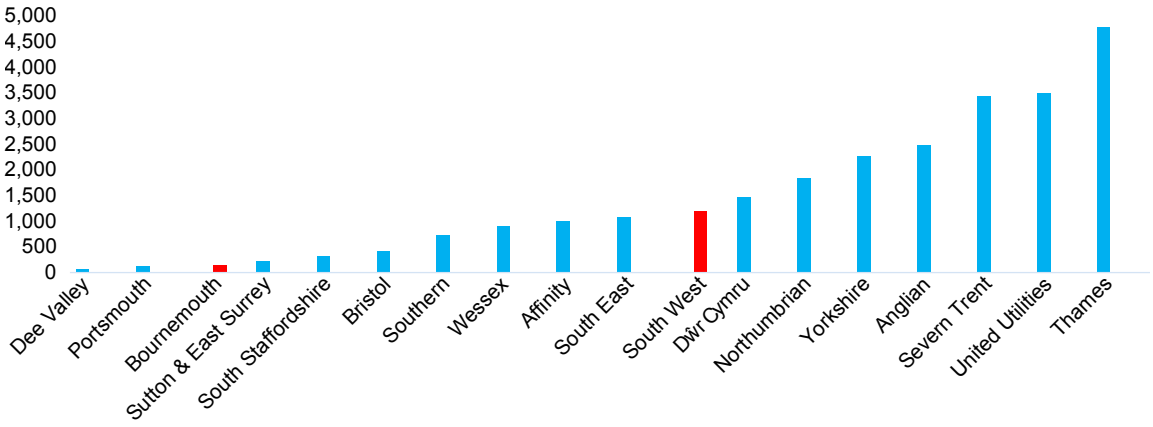
[2] BWIL was named Sembcorp Bournemouth Water Investments Limited until 16 April 2015.
[3] There are also six small local water companies with around 2,000 customers and 12 water supply licensees that are regulated by Ofwat, but these are excluded from Ofwat's benchmarking assessments and therefore from our report.
[4] The RCV is the value of the capital base of each company for the purposes of setting price limits (and therefore the return on capital). All RCV figures quoted are at 1 April 2015.

2.3 The water-only (that is, excluding sewerage services) RCVs of the 18 main water companies are shown graphically in Figure 1.

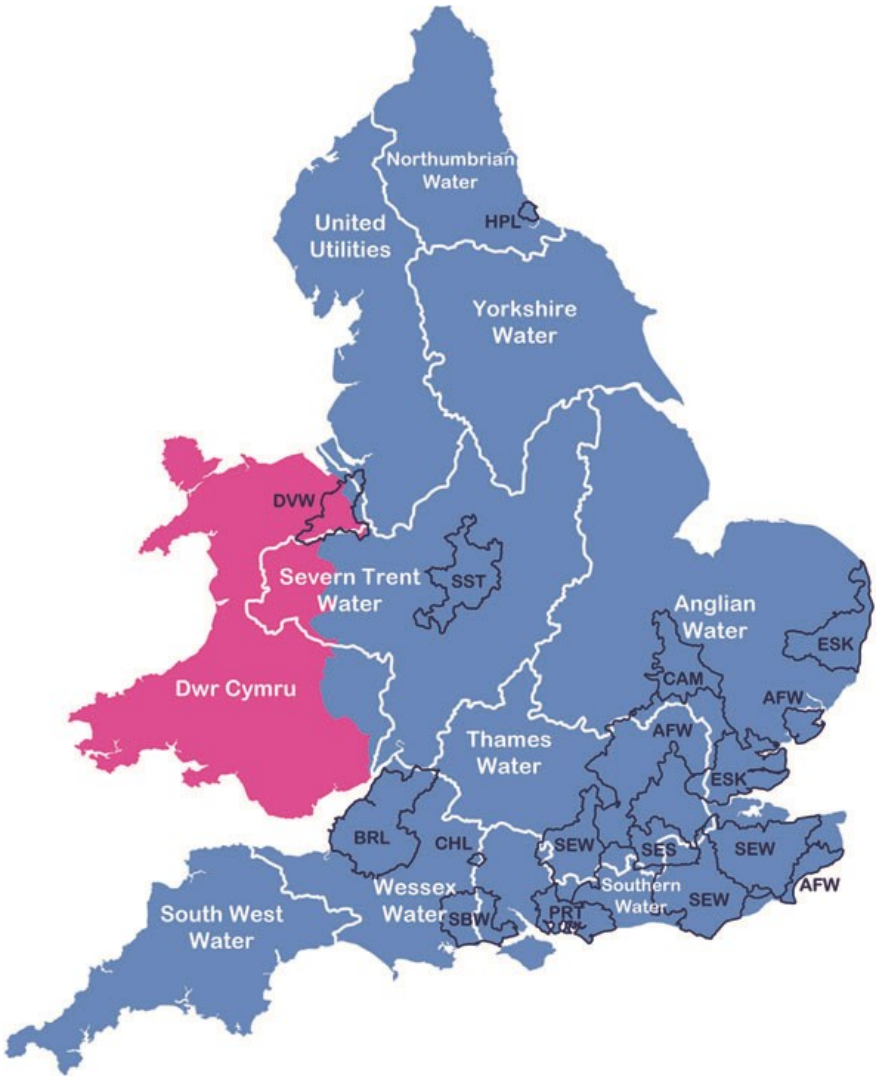
Figure 1: Water-only RCV by company



Source: Ofwat.

2.4 The geographical regions covered by each of the water companies in England and Wales are shown in Figure 2.

Figure 2: Map showing water companies in England and Wales



Source: Ofwat.

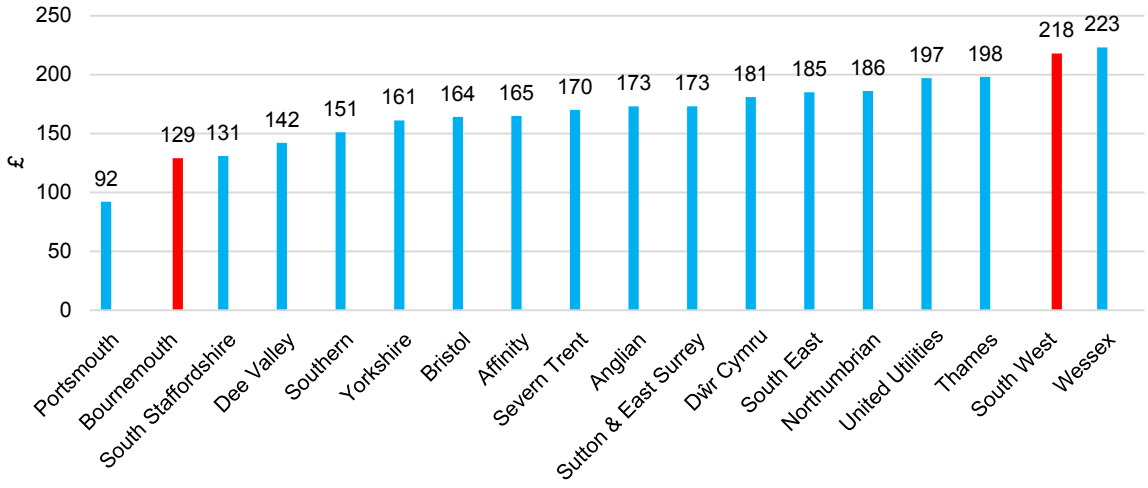
2.5 The total water services turnover of the water companies in 2014/15 was £5.8 billion, of which the WoCs accounted for £925 million (or 16%).[5] Wholesale revenues account for around 90% of the value chain in the supply of water.

2.6 Over £120 billion has been invested by the water companies since privatisation in order to improve water quality, reduce pollution and improve the resilience of the system. Drinking water quality in England and Wales is high; the DWI (which regulates water quality) reported that, in 2013, the overall figure for public water supply compliance with the EU Drinking Water Directive in England and Wales was 99.97%.[6]

[5] Regulatory accounts data share, Table A5.
[6] Letter from the Drinking Water Inspectorate to the Parliamentary Under-Secretary for Natural Environment and Fisheries (1 July 2014).

2.7 Household water bills vary considerably around the country, as companies have different cost bases and levels of efficiency. Figure 3 shows the average household water bills (excluding sewerage) for 2015/16.

Figure 3: Average household water bills 2015/16 (2012/13 £s)



Source: Ofwat final determination for PR14.

2.8 Water companies abstract water from a variety of sources including boreholes and surface water (for example, rivers). To do so they require a licence from the Environment Agency (EA). Licence holders are able to trade water abstraction licences if they so wish (and with the approval of the EA).[7] The transferred rights are usually set out in a new abstraction licence. The EA encourages trading because it allows it to allocate water resources in a way that meets demand and supports the environment without the abstraction of additional water. Ofwat is concerned that there is currently over-abstraction, particularly in the south-east of England.[8] It wants to make the cost of abstracting water more reflective of the scarcity of water in the area, and also encourage the trading of abstraction rights by lowering the barriers to trading.

2.9 Water companies can also trade physical water between themselves. To date, this has happened to a limited extent. The Water Act 2014 (the Water Act) contains provisions relating to the bulk supply of water (aimed at encouraging water trading), to help join up the national supply network by making it easier for water companies to buy and sell water from each other.

2.10 Within its area of operation, each water company is a monopoly provider and generally household customers have no choice of supplier. There are,

[7] Abstraction licences are used by a number of different industries in addition to the water industry, such as farming, fish farming, energy producers and manufacturers.
[8] Ofwat: Water rights trading.

however, five ways in which competition can be achieved under the current regulatory framework.

- **Water supply licences**: from 1 December 2005 new water supply licensees were able to access a water company's supply system for the purpose of supplying non-household customers whose annual average consumption is greater than 50 megalitres (Ml) a year. There are approximately 2,200 customers in England falling within this category. The threshold was dropped to 5 Ml in 2012 for customers of water companies operating wholly or mainly in England,[9] and as a result approximately 26,000 customers in England are now able to source their water from a water supply licensee.[10] Potential entrants need to obtain a licence from Ofwat. They can either apply for a 'retail' licence, which enables the holder to buy water wholesale from a water undertaker and sell to eligible customers; or a 'combined' licence, which allows the holder to introduce water into an existing water undertaker's supply system and sell it on to eligible customers. In both cases an access agreement is needed with the wholesaler, to buy water from it or to introduce water into its system.

- **New appointments and variations**: (also termed inset appointments) allow the existing regulated water or sewerage supplier to be replaced by another for a defined geographical area or site. A new appointee can provide water or sewerage services, or both. In order to be able to choose a new appointee, a customer must satisfy one of three criteria.[11]

- **Cross-border supplies**: water companies have a duty to supply water for domestic purposes[12] to household and non-household customers outside their area provided that the customer is willing to pay the cost of making the connection to the water company's distribution network. They also have a qualified duty to supply water for non-domestic purposes outside their area provided that the customer is willing to pay the cost of making the connection to the water company's distribution network. This latter duty does not apply to customers who are eligible under the water supply licencing regime.

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[9] The threshold remains 50 Ml for customers of undertakers whose area is wholly or mainly in Wales.
[10] Our understanding is that very few customers have switched retailers under water supply licences.
[11] Ofwat: New appointments and variations. Briefly, either the customer must be a large user (50 Ml water per year for customers of water companies whose area is wholly or mainly in England or 250 Ml for customers of water companies whose area is wholly or mainly in Wales), or the site must be unserved by the existing water and sewerage undertaker, or the existing water and sewerage undertaker consents to the transferring of the site to the new appointee.
[12] Briefly, 'domestic purposes' in relation to a supply of water means drinking, washing, cooking, central heating and sanitary purposes but excludes the business of a laundry or the business or preparing food or drink for consumption off the premises (see section 218 of the WIA).

- **Private supplies** – any person who owns a self-contained supply of water is entitled to supply water to others by agreement (subject to rules concerning water quality). This form of supply is not regulated by Ofwat. Local authorities enforce the rules concerning water quality and the DWI has an advisory role in relation to private water supplies.

- **Providing new pipes** – developers are able to lay certain new water mains, sewers, service pipes and lateral drains, either directly or using their own contractors. If water assets are laid in accordance with the water companies' standards then the water companies must take over responsibility for them ('adopt them') before a water supply is provided through them. Developers can agree to have the sewers they lay adopted by the sewerage undertaker.[13]

3. Water regulation and key bodies

Regulatory framework and approach

3.1 The supply of water in the UK is highly regulated.

3.2 The regulations affecting the industry are wide-ranging, concerning, for example, the amount of revenue water companies can earn from supplying water, water quality standards, environmental standards regarding water abstraction and disposal, and the mandatory supply of water to households (even in the event of non-payment of bills).

3.3 Each water company operates under the terms of an Instrument of Appointment (also known as a licence) issued by the Department for Environment, Food and Rural Affairs, and which can be amended by Ofwat from time to time. The licence specifies the geographic area in which the company is to be a water undertaker[14] (or a water undertaker and sewerage undertaker, as the case may be) and imposes conditions of appointment on the company concerned.

3.4 Water undertakers have a power to make charges for any services provided in the course of carrying out their statutory functions in relation to water.[15] These charges are capped, as the conditions of appointment of all the water

[13] Since October 2012, all new sewers and lateral drains that connect to the public sewer network, including associated pumping stations, must be adopted by the water and sewerage undertaker.
[14] Water undertakers (which provide water services only) are to be distinguished from the Water and Sewerage undertakers (which provide both water and sewerage services) and from Licensed Water Suppliers, which supply water, taken from an undertaker's water supply system, to non-domestic premises under a section 17A WIA 91 Licence (provisions added by the Water Act 2003).
[15] WIA, section 142.

undertakers include a Condition B (charges) which enables Ofwat to carry out periodic reviews and to make price control determinations which are designed to limit the charges levied by the relevant company and the revenue allowed to that company.

3.5 Ofwat makes a price control determination which limits the revenue that water companies receive, taking into account appropriate investments and the service package that customers receive. To date it has done so every five years although the period of price controls is at the discretion of Ofwat.[16] Following changes implemented as part of the 2014 price review, the price controls over a company's retail and wholesale activities are calculated separately.[17] In addition, Ofwat sets PC targets for some quality of service aspects of wholesale supply and provides incentives for water companies to improve their quality of service at the retail level.

3.6 If the water undertaking disputes Ofwat's determination following a 'periodic review', it can give notice, within two months of the determination, requiring Ofwat to refer the matter to the CMA for determination.[18]

3.7 The following section broadly outlines how four of Ofwat's regulatory functions operate which are of interest to us in this inquiry, namely: setting wholesale price controls; setting retail price controls; setting some wholesale quality of service targets; and providing incentives to improve retail quality of service.

Wholesale price controls

3.8 At PR14 Ofwat set separate price controls for wholesale activities and retail activities.[19]

3.9 The wholesale 'price controls' on water companies operate as restrictions on revenues rather than restrictions on specific prices or tariffs. The restriction refers to the percentage annual change in a measure of the total charges/ revenues attributed to water companies' wholesale activities but does not

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[16] Note that the non-household retail control was set for only two years at PR14.
[17] Within the industry different terminology is used to refer to different aspects of particular Ofwat price review periods, also known as price determination periods. In order to simplify the terminology in this report we adopt 'PR14' to describe the most recent price review which concluded in 2014 and set price controls for the period 2015 to 2020. The 'PR14 period' refers to the 2015 to 2020 period, which is also known as 'AMP6' (asset management period 6). The next price review will occur in 2019 and is referred to as 'PR19' (to set price controls for 'AMP7'). The previous price determination period was for 2010 to 2015 and is known as 'PR09' (or 'AMP5').
[18] WIA, section 12(2)(b).
[19] The wholesale control covers the non-retail services that the water companies provide – such as treating water so it is fit to drink, and transporting it through a network of pipes to a customer's property. (Retail is defined in the licence and wholesale is then defined as all licensed activities excluding retail.) The retail price control covers customer-related services that the water companies provide – such as sending customers' bills, and responding to customer enquiries. See Price review 2014.

specify the individual prices or tariffs that water companies charge for water services (such as unit charges, standing charges, or business tariffs). The total allowed revenue for a company's wholesale activities in a year is measured by the formula RPI + K where 'K' may be positive or negative and RPI is the retail price index. K limits the water company's revenue and reflects what Ofwat considers the relevant company needs to spend to finance its investments and properly provide services to its customers during the period covered by the price review.[20] The present price control is set for each of the five years starting on 1 April 2015.[21] There are separate regulatory processes, policies and rules that apply to water companies' decisions on the level of individual tariffs.[22]

3.10 In order to set allowed revenue for water companies, Ofwat determines an expected level of expenditure within the price control period on wholesale operating activities (the 'wholesale expenditure allowance'). The wholesale expenditure allowance covers both operating (opex) and capital expenditure (capex) and is known as 'totex' (total expenditure).

3.11 To determine the wholesale expenditure allowance for each company Ofwat uses benchmarking analysis that compares measures of totex across the 18 water companies that provide drinking water. This benchmarking analysis is based on econometric modelling. The benchmark that Ofwat chose as part of PR14, which governed the totex cost allowances that it granted, was set at a UQ efficiency level for the 18 water companies.[23]

3.12 Ofwat's benchmarking analysis and its use of econometric models was complemented by the wider process for company-specific analysis and special cost factor adjustments (companies were able to submit requests for special cost factors to be taken into account by Ofwat where they considered that the Ofwat models did not reflect their individual circumstances). Ofwat accepted that its benchmarking models cannot capture every company's specific cost drivers. Ofwat therefore, where appropriate, took into account company-specific factors that may not be captured in its benchmarking models. For example, one company may need to undertake unusually high investment in its treatment plant, or another may have a large industrial customer accounting for a significant percentage of its total volume supplied.

3.13 In addition to its econometric modelling, Ofwat conducted a risk-based review of water companies' business plans. Plans judged to be of exceptional quality

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[20] See SWW Licence, Condition B, paragraph 9.4.
[21] SWW Licence, Condition B paragraph 9.6(1).
[22] These tariffs tend to be set annually, subject to the overall constraints from the aggregate revenue control.
[23] The UQ is set by estimating the relative efficiency of each company and ranking them from 1 to 18. The UQ then lies between the fifth- and the sixth-ranked water company (at a hypothetical ranking of 5.25).

(in the areas of proposed outcomes, the cost of delivering those outcomes, the balancing of risks and rewards between the company and its customers, and affordability and financeability) were classified as pre-qualified for 'enhanced' status. Water companies that accepted the criteria necessary to qualify as enhanced were fast-tracked to an early draft determination in April 2014 (as opposed to August 2014 for water companies with 'standard' plans[24]). They were protected against later changes by Ofwat to the cost of capital and other interventions and also benefited from an initial financial reward. Ofwat also did not intervene to make major changes to the business plans of water companies with enhanced status. Fast-tracking meant that those water companies with enhanced status were able to start focusing on how they were going to deliver the outcomes promised in the business plans several months earlier than other water companies.

3.14 Ofwat applied a 'menu regulation' scheme for PR14, under which it compared each company's totex in its business plan with Ofwat's own totex estimates derived from its models (Appendix B). Depending on how far above or below Ofwat's estimate the company's own estimate was determined the extent to which cost efficiencies or overruns over the price control period would be shared between shareholders and customers. In addition, the menu scheme provides rewards and penalties for forecasting below or above Ofwat's cost assessment. Water companies with enhanced status received an additional incentive under the totex menu.

3.15 In its final determinations at PR14, Ofwat set a wholesale weighted average cost of capital (WACC) of 3.6%. There were some exceptions:

- Enhanced water companies (SWW and Affinity) were awarded a higher WACC of 3.7%.
- Portsmouth Water and BW were allowed a small company uplift on the cost of debt of 0.25%, equating to a 0.15% uplift on the overall cost of capital.

Retail price controls

3.16 At PR14 Ofwat set retail price controls for non-household and household customers separately. Given the reforms in the Water Act regarding non-household customers in England being able to switch their supplier of water retail services from 2017 (paragraph 3.26), at PR14 Ofwat regulated price controls on these activities for two years only.

[24] Or May for Welsh Water and Northumbrian Water.

3.17 For household retail price controls, at PR14 Ofwat regulated retail revenue by means of an ACTS. The industry-wide ACTS levels were determined by Ofwat by using a simple average across the 18 water companies' CTS. The ACTS did not take into account any company-specific factor including any measure of the size of the company. The industry-wide ACTS levels for each customer type were then used as benchmarks by Ofwat. It applied an efficiency challenge, requiring each company whose forecast costs were above the ACTS to bring their costs down to at least the ACTS level over a three-year glide path. Efficient water companies whose costs were below the ACTS were allowed their forecast costs contained in their business plans. Ofwat then added back in any approved company-specific adjustments before applying a net margin (1% in the case of households) to calculate each company's allowed retail revenue (expressed both as a total and as a per customer amount based on forecast customer numbers).[25]

Wholesale quality of service: outcome delivery incentives

3.18 For PR14 water companies developed a set of outcomes that reflected what their customers needed, wanted and could afford. These outcomes would then be the subject of PCs[26] and ODIs, which could be either financial or reputational. In assessing company business plans, Ofwat sought evidence to assess that the PCs proposed were challenging and appropriately incentivised each company to deliver on their commitments (through a scheme of rewards and penalties).

3.19 ODIs (and associated PCs and outcomes) are bespoke to each company with relatively few common ODIs across water companies. Throughout the industry there are 171 distinct outcomes with 515 PCs of which 312 were incentivised through financial ODIs.[27] They are wide-ranging and cover aspects such as interruptions to the supply of water, number of burst mains, restrictions on water use, contribution to improving rivers and carbon emission levels.

3.20 Ofwat required the water companies to establish and work with their customer challenge group (CCG). The CCGs were set up with the intention of ensuring that customers' views would be taken into consideration as part of the review, in particular in the choice of outcomes and associated investment

[25] Ofwat's risk and reward guidance (January 2014), p35.
[26] PCs measure the direct and tangible services needed to achieve outcomes.
[27] Ofwat (December 2014), *Setting price controls for 2015-20. Final price control determination notice: policy chapter A2 – outcomes*.

programmes and ODIs. Thus the incentives were directly linked to customer priorities and their willingness to pay.

3.21 Ofwat chose to intervene in a number of these areas, particularly regarding the target levels of service required. In some cases, it did this to ensure that water companies were targeting UQ level performance.

Retail quality of service: Service incentive mechanism

3.22 Ofwat regulates the quality of retail service through its use of the SIM. The SIM is designed to encourage water companies to provide better service to customers. It also allows customers to compare the performance of their company with others in the industry.

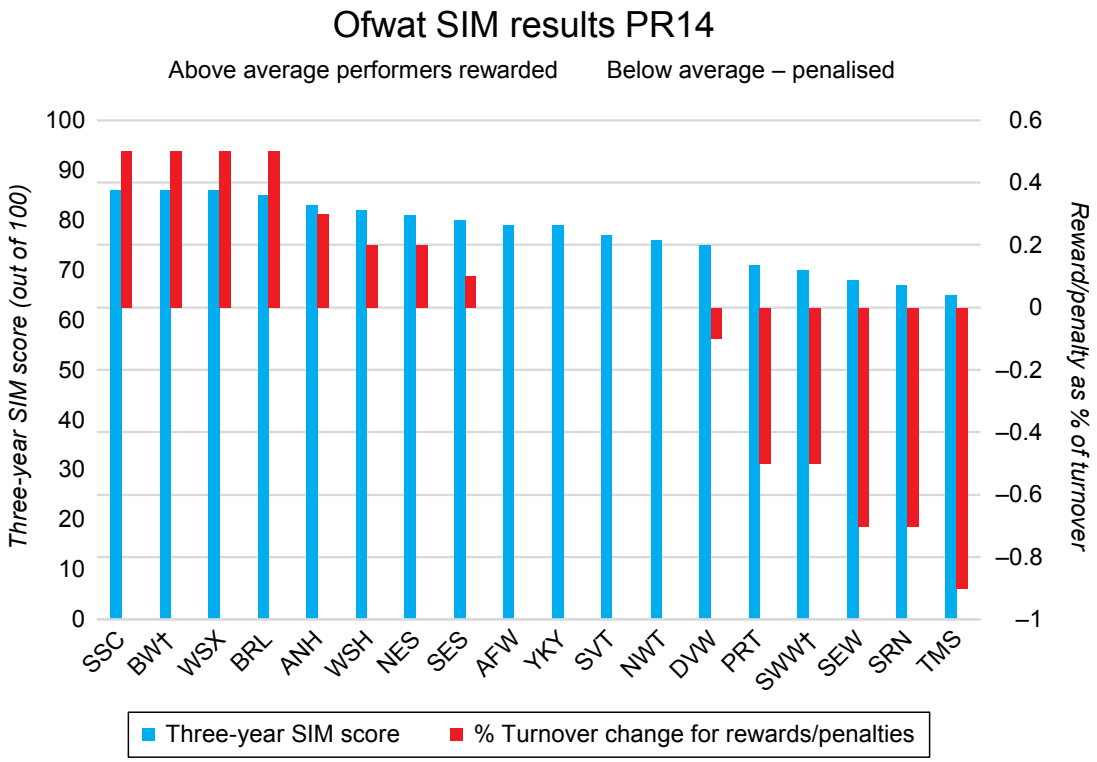
3.23 The SIM score is determined by:

- qualitative research on customer satisfaction levels using surveys of customers who have had recent contact with their water company and;
- a quantitative assessment of the number of complaints a company receives, with escalated complaints receiving a progressively higher weighting.

3.24 Each company is given a score out of 100 (their SIM score), which is derived by combining the qualitative and quantitative assessments. The SIM is a comparative performance measure which encourages water companies to compete with each other to receive a reward. The reward cap is 0.5% of turnover and the penalty cap is –1.0% of turnover.[28] This incentive mechanism is based on performance relative to the industry average. Ofwat uses standard deviations from the average to determine the value of any reward or penalty. In this way high-performing water companies relative to others in the industry receive a reward for good customer service while, conversely, relatively poorly performing water companies receive a penalty. Other water companies – there were four of these in the last determination – that are neither relatively high performing nor poorly performing did not receive either reward or a penalty. Figure 4 sets out the SIM results at PR14. The incentives apply at each price review and result in a turnover adjustment for the five years of the price control period (eg a high-performing company with turnover of £100 million per year would be rewarded by up to £2.5 million in extra revenue over the period).[29]

[28] The rewards and penalties are graduated with them increasing the further away a company's result is from the mean. Ofwat (April 2014), *Service incentive mechanism (SIM) for 2015 onwards – conclusions*.
[29] 0.5% x £100m x 5 years.

Figure 4: SIM incentives applied at PR14*



Source: CMA based on Ofwat data.
*See Glossary for a list of water companies.
†To note–SBW=BW (2nd place with a +0.5% reward) and SWT=SWW (15th out of 18th with a –0.5% penalty).

Planned regulatory reforms

3.25 The Water Act contains a number of regulatory reform measures.[30]

3.26 At present water supply licensees can only supply non-household customers whose annual average consumption is greater than 5 Ml per year (or 50 Ml per year in the case of customers of water undertakers whose area is wholly or mainly in Wales). Under the Water Act, which enacted a number of the recommendations made in 2009 by Professor Martin Cave in the Cave Review of competition and innovation in water markets,[31] as from 1 April 2017 all non-household customers of water undertakers whose area is wholly or mainly in England will be free to switch their retail supplier. This reform is

[30] The Water Act also introduces measures reforming the special water merger control regime. These provisions do not apply to this inquiry.
[31] The Cave Review identified a programme for the introduction of competition and use of market-type instruments into the water sector, beginning with opening up retailing to business customers and reforms of the arrangements for abstraction and discharge which are intended to achieve a more rational use of water resources and to stimulate trading across company boundaries. Then, subject to an appropriate governance structure, competition would be introduced into upstream treatment activities, either by the creation of a single buyer of wholesale water or through a common carriage regime. At the same time, the balance of risk of and return to companies' remaining regulated activities would be changed to encourage more innovative approaches, especially those which avoid heavy capital investment. Heightened stimuli to investment would also flow from relaxing restrictions on mergers and takeovers, and measures to enhance the innovative capabilities of companies.

expected to create an English market of about 1.1 million customer sites. The Welsh government intends to retain the existing threshold of 50 Ml per year in relation to customers of water undertakers whose area is wholly or mainly in Wales.

3.27 Provision has also been made under the Water Act for the creation of a cross-border retail market between England and Scotland. Regulations are to be made to allow Ofwat and its Scottish equivalent – the Water Industry Commission for Scotland (WICS) – to accept a single application for a water services licence in each other's jurisdiction.

3.28 The Water Act contains a mechanism for incumbent water and sewerage companies to voluntarily exit from the retail market, but only with the consent of the Secretary of State and only as regards non-household customers. This will allow an incumbent company, if it so wishes, to concentrate on the wholesale aspects of its business. One or more retail licensees will then provide the retail services. The incumbent company must ensure that another retail licensee (or more than one licensee) is in place to take over its customers and the agreement to do so is a matter of commercial negotiation between the incumbent and the new retail provider. This liberalisation is expected to come into force on 1 April 2017.

3.29 Changes under the Water Act should also make it easier for new providers of water sources and sewerage treatment services to provide services that were previously part of the regulated monopoly businesses with the aim of stimulating efficiency and innovation. These changes have not yet been worked out in detail and will not be introduced until after 2019, following the opening up of the retail market. In particular, the current combined licence is to be unbundled so that it will be possible for a licensee to hold a wholesale authorisation without being obliged to provide retail services (such as billing and other customer-facing services). Thus, for example, a non-water company that holds an abstraction licence for its own use could, if it had surplus water left over, seek authorisation to sell this back into the water network without the need to provide associated retail services.

3.30 To maximise opportunities for new entrants to provide wholesale water supply, access rights will be extended to the water companies' treatment and storage systems rather than just the mains and pipes, as is currently the case. This will allow alternative suppliers, such as landowners with spare water, to input water into any part of the network (for example, directly into a reservoir or other storage facility) in order to supply their own customers, other licensees or their own premises under a self-supply licence.

3.31 Beyond the reforms contained in the Water Act Ofwat has recently launched a programme of work called Water 2020 which will conclude with the delivery of the 2019 price review and will look to develop the regulatory and market mechanisms to deliver the reforms of the Water Act.[32] It will also apply lessons learned from PR14, address various challenges such as water scarcity and population growth, and deal with other regulatory proposals covering abstraction reform and the reform of water resource management plans. The Water 2020 programme has a particular focus on:

- developing and implementing the upstream market in England;
- developing and delivering an efficient and effective methodology for the 2019 price review;
- supporting the development of retail competition for non-households; and
- understanding its duty to promote resilience in water supplies.

3.32 Ofwat published an issues paper on its Water 2020 programme in July 2015[33] and a consultation paper is due to be issued in December 2015.

3.33 In addition to the above regulatory reforms Ofwat has told us that in some instances it plans to change how it applies its existing tools to make various comparisons between water companies. These have been taken into account as appropriate in our assessments of how the merger impacts on Ofwat's ability to make comparisons between water companies.

Key regulatory and industry bodies

Ofwat

3.34 The general duties of Ofwat are set out in section 2 of the WIA, and consist of five principal duties and five secondary duties. The principal duties may be summarised as follows:

- To further the consumer objective (ie to protect the interests of consumers, wherever appropriate by promoting effective competition between persons engaged in, or in commercial activities connected with, the provision of water and sewerage services).

[32] See *Introduction to Water 2020* (2 June 2015).
[33] See Ofwat (July 2015), *Towards Water 2020 – meeting the challenges for water and wastewater services in England and Wales*.

- To secure that each water company's functions under the WIA are properly carried out.

- To secure that each water company is able (in particular, by securing reasonable returns on its capital) to finance the proper carrying out of those functions (this is sometimes referred to as the 'financeability duty').

- To secure that the activities authorised by each company's licence and any statutory functions are properly carried out.

- To further the resilience objective (ie to secure the long-term resilience of water undertakers' supply systems and sewerage undertakers' sewerage systems as regards environmental pressures, population growth and changes in consumer behaviour, and to secure that undertakers take steps for the purpose of enabling them to meet, in the long term, the need for the supply of water and the provision of sewerage services to consumers).[34]

3.35 Ofwat's secondary duties may be summarised as follows:

- To promote economy and efficiency on the part of water companies in carrying out their functions.

- To secure that no undue preference or undue discrimination is shown in the fixing of water and drainage charges.

- To secure that consumers are protected as regards benefits that could be secured for them from the proceeds of any disposal of a water company's protected land.

- To ensure that consumers are protected as regards any activities of a water company which are not attributable to the exercise of its functions under the WIA.

- To contribute to the achievement of sustainable development.

- To have regard to the principles of best regulatory practice.

3.36 When exercising its powers Ofwat has a general duty to consider the effect on the environment.

3.37 As mentioned above, Ofwat sets a control on allowed revenue which limits the increases that water companies can make to their charges. In addition to

[34] This currently applies only in relation to water companies whose areas of supply are wholly or mainly in England.

setting these price controls Ofwat will determine service quality targets and will monitor and enforce performance against those targets and, more generally, the water companies' compliance with their licence obligations.

3.38 Ofwat has concurrent competition law powers with the CMA which means that Ofwat has the power to take enforcement action within the water industry regarding the prohibitions on agreements that prevent, restrict or distort competition and on the abuse of a dominant position, under the Chapter I prohibition and the Chapter II prohibition of the Competition Act 1998 and under Article 101 and Article 102 of the Treaty on the Functioning of the European Union. Ofwat also has powers to undertake market studies, and to make market investigation references to the CMA for an in-depth market investigation relating to commercial activities connected to the supply of water or provision of sewerage services.[35]

Drinking Water Inspectorate

3.39 The DWI, a part of the Department for Environment, Food and Rural Affairs, enforces water quality standards in England and Wales.[36]

3.40 The DWI investigates all drinking water quality events in England and Wales and will bring prosecutions if it believes that it has reliable evidence that an offence was committed, where the company does not have a defence that it took all reasonable steps and exercised all due diligence, and when such a prosecution is regarded as being in the public interest. It undertakes technical audits and inspections of water companies and provides advice to government on drinking water quality issues.

Environment Agency

3.41 The EA is a non-departmental public body responsible for the protection and improvement of the natural environment in England. It is the principal adviser to government on environmental matters.

3.42 The EA has a duty to secure the proper and efficient use of water resources in England. It mainly does this through licensing the abstraction of groundwater and river water. Licences can be traded. New abstraction licences are time-limited and can be revoked if the abstraction causes serious environmental

[35] WIA, section 31.
[36] Determined by Water Supply (Water Quality) Regulations 2000 and the EU Drinking Water Directive (Council Directive 98/83/EC, 3 November 1998).

damage. Water companies are required to prepare drought plans and 25-year water resource management plans.

Consumer Council for Water

3.43 The Consumer Council for Water (CCWater) is a non-departmental public body representing the interests of household and non-household customers of water and sewerage providers in England and Wales. CCWater is funded from licence fee monies that water companies pay.

3.44 It handles complaints (which have not been satisfactorily resolved by the water company in question) and concerns from customers by liaising with the water companies and with Ofwat. It has a role in examining and commenting on water companies' social tariff plans.[37] Moreover, CCWater undertakes a range of research on issues affecting households and non-households.

Customer challenge groups

3.45 As part of PR14 Ofwat required that each water company should establish an independent CCG to identify and focus on customer priorities. The CCG's role was to review and challenge the way water companies engaged customers and took customer views into account and to provide assurance to Ofwat about the quality and effectiveness of water companies' direct engagement with customers. CCWater was a member of each CCG and therefore played a key role in that part of PR14.

3.46 CCGs had a specific role within the PR14 price review to determine which services and/or improvements customers viewed as a priority. CCGs were particularly influential in setting ODIs for each company. Since then we understand that some CCGs have been disbanded and others have changed form. However, the experience of using CCGs has been viewed by the industry and by Ofwat as a constructive one and Ofwat has told us that it would like to continue to seek customer views in a similar manner during the next price determination. Therefore, CCGs (or customer groups similar to CCGs) are likely to play a role in PR19. We understand that some water companies – including the merger parties – have already created new customer groups.

[37] Social tariffs are payment schemes devised by the water companies to assist household customers pay their water bills who would otherwise struggle to pay them.

3.47 As well as reviewing certain water mergers, the CMA is the appeal body for water companies and Ofwat. A company may appeal against a decision of Ofwat in respect of a price determination, interim adjustments to price caps and any amendment to the companies' licences. The WIA requires Ofwat in accordance with the terms of a water company's licence conditions to refer any disputed determination of price limits to the CMA for review. In these instances the CMA is able to set new price limits for the water company concerned.

4. The merger parties

Pennon

4.1 Pennon is a company listed on the London Stock Exchange which operates and invests in utility infrastructure businesses. Pennon has around £5 billion in assets and employs approximately 4,500 people in the UK.[38] Its market capitalisation (at 26 June 2015) was approximately £3.5 billion.

4.2 Pennon has two principal subsidiaries: South West Water Limited (SWW) and Viridor Waste Management Limited (Viridor). Viridor is a large UK-based recycling, renewable energy and waste management business. Operationally, Viridor is not affected by this merger.

SWW

4.3 SWW is a WaSC and provides water and sewerage services to approximately 700,000 households and 70,000 businesses in Devon, Cornwall and parts of Dorset and Somerset.[39] In all it serves a region of nearly 10,300 km^2. Although one of the smallest WaSCs in England and Wales, based on number of customers (its catchment areas has a resident population of 1.7 million,[40] or approximately 3% of the population of England and Wales), SWW has the longest coastline of any WaSC at 625 miles long,[41] and includes 35% of all the designated bathing waters in England. This significantly affects its costs for providing sewerage services. The impact on household bills was recognised by the government, which agreed a £50 reduction on all annual

[38] Pennon's initial submission, paragraph 5.58.
[39] Pennon's initial submission, paragraph 5.60.
[40] Note that SWW's infrastructure also has to be able to cope with some 8 million visitors each year to the region.
[41] www.thewaterplace.co.uk/sww.htm.

household water and sewerage bills from 2013/14 to 2020, paid for by central taxation.

4.4 93% of SWW's treated water comes from surface water sources[42] (21 raw water reservoirs and 13 river abstractions) and the remainder from 27 boreholes.[43] Raw water is treated in 29 water treatment works, and onward distribution to customers involves the use of 200 booster pumps and 250 service reservoirs.[44] SWW's region has one of longest lengths of distribution pipework per customer in England and Wales, as the population is largely rural.

4.5 Some 79% of SWW's customers are on a metered bill,[45] which we understand is high compared with other water companies in England and Wales. In 2013/14, average consumption in unmetered households in SWW's region was 171.6 litres per head per day, compared with 121.3 litres per head per day in metered households.[46]

4.6 At the start of the PR14 period, 1 April 2015, SWW's wholesale water service RCV was £1,192.9 million. Ofwat's final determination is projected to result in a growth of the wholesale water service RCV to £1,247.7 million at 31 March 2020 (in 2012/13 prices) before indexation of the RCV for RPI inflation during the PR14 period.[47] The final determination allows SWW to receive revenues of £2,290 million over the PR14 period (in 2012/13 prices for wholesale revenues and nominal retail revenues), split between £919.8 million for wholesale water revenue, £1,207.1 million for wholesale wastewater revenue and £163.2 million for household retail revenue. SWW's indicative average water and sewerage bill in 2019/20 will be £481 (in 2012/13 pounds), compared with an average bill of £516 in 2014/15.

4.7 In addition to the regulated activities of a WaSC, SWW has non-regulated operations which include Source for Business Limited, a water services retailer with a licence to operate in Scotland as well as England, as well as providing on site water efficiency and waste management services for business customers.[48,49] In total, non-regulated services account for less than 1% of SWW's turnover and are not discussed further in this report.

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[42] Pennon's initial submission, p30.
[43] SWW 2014 annual report.
[44] ibid.
[45] SWW business plan.
[46] SWW 2013/14 regulatory accounts, note 10 to the current cost accounts.
[47] Ofwat PR14 final determination – SWW appendix.
[48] Pennon's initial submission, paragraph 5.61.
[49] The non-regulated activities provided by SWW to third parties include: *(a)* property searches (based on records held in SWW's area of operation); *(b)* water efficiency, quality and process advice (provided almost exclusively to

4.8 SWW had a turnover of £524.7 million in the year to 31 March 2015 of which £517.8 million came from regulated activities.

Bournemouth Water Limited

4.9 BWIL (formerly known as Sembcorp Bournemouth Water Investments Limited) was acquired by Pennon from Sembcorp Holdings Limited, a Singapore-based private equity company, on 16 April 2015. On the same date, BWIL changed its name to remove all reference to 'Sembcorp', as required under the terms of the Sale and Purchase agreement. BWIL is the parent company of Bournemouth Water Limited (BW).

4.10 BW is a WoC. It supplies drinking water to approximately 440,000 people from its base in Bournemouth (187,500 household customers and 16,000 non-household customers). It covers 1,041 km^2 and includes parts of Dorset, Hampshire and Wiltshire. The area stretches from Poole in the west to Beaulieu in the east and just south of Salisbury in the north. Wastewater services in this area are provided by Wessex Water to customers located in the west of BW's catchment area and by Southern Water to customers located in the east. Customers receive separate bills for water and wastewater services.

4.11 BW's treated water comes from the Stour and Avon rivers plus several boreholes.[50] River abstractions account for approximately 85% of BW's water supply and boreholes for the remainder.[51] Raw water is treated in seven water treatment works, and onward distribution to customers involves the use of 20 service reservoirs[52] and 2,822 km of mains pipes.[53]

4.12 Some 65% of BW's household customers are on a metered bill[54] and average per capita consumption (across all households) is around 146 litres per day.[55] BW's metered customers generally use around 10% less water than its unmetered customers.[56]

4.13 In terms of non-household customers, BW has one very large industrial customer with which it has a special arrangement, namely the Esso refinery at Fawley (it also supplies non-drinking water to some other tenants on the

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customers in SWW's area of operation); and *(c)* laboratory testing services (provided primarily in specialist areas to other water companies).
[50] BW website.
[51] BW Water Quality - Company Profile.
[52] Number of service reservoirs adjusted to show current number of assets in operational use.
[53] BW 2013/14 regulatory financial statements, page 111.
[54] BW 2013/14 regulatory financial statements, p17.
[55] ibid, p19.
[56] ibid, p17.

Fawley site). Esso Fawley consumes approximately 26% of the total quantity of water supplied by BW (approximately 38 Ml/day compared with BW's average supply of 146 Ml/day). In BW's 2014/15 regulatory financial statements, turnover attributable to 'large users and special agreement' amounted to just over 12% of total turnover for the year.[57]

4.14 At PR14 BW was one of two water companies to be allowed an uplift of 0.15% above the 3.6% wholesale cost of capital assumed by Ofwat for all other (non-enhanced status) water companies. The uplift was to allow for the fact that, as a small company, BW would typically be expected to face a higher cost of debt than would a larger company. Its wholesale cost of capital assumed within its price control is therefore 3.75%.[58]

4.15 At the start of the PR14 period, 1 April 2015, BW's RCV was £140.6 million. Ofwat's final determination will result in a growth of the RCV to £144.0 million at 31 March 2020 (in 2012/13 prices) before indexation of the RCV for RPI inflation during the PR14 period. The final determination allows BW to receive revenues of £184.2 million over the PR14 period (in 2012/13 prices for wholesale revenues and nominal for retail revenues), split between £159.9 million for wholesale water revenue and £24.3 million household retail revenue. BW's indicative average household bill (in 2012/13 prices) will fall from £145 in 2014/15 to £129 in 2015/16 and then stay at that level (in real terms) until the end of 2019/20.

4.16 BW also has a number of non-regulated businesses. These include Aquacare (BWH) Limited which provides water hygiene and treatment services; Avon Valley Water Limited which has its own water supply licence and provides water retail services to industrial customers outside of BW's area of operation; and BW owns some boat moorings and a fishery in the Christchurch Harbour area.[59] Total turnover from all BW's non-regulated activities amounts to approximately £4 million.

4.17 BW had a turnover of £46.4 million in the year to 31 March 2015, of which £44.8 million was from regulated activities.

[57] BW 2014/15 regulatory financial statements, p119 (5,507/44,848).
[58] Ofwat PR14 final determination – BW appendix.
[59] BW 2014/15 regulatory financial statements, p130.

5. The merger

The transaction

5.1 On 16 April 2015 Pennon acquired the entire issued share capital of BWIL, including its non-regulated and regulated subsidiaries, from Sembcorp Holding Limited for a cash consideration of £100.3 million. As part of the acquisition £86.9 million of external net debt and debt-like items have been assumed by Pennon.

The rationale

5.2 Pennon told us that BW was a profitable business and one of the highest performing WoCs in the UK across a range of indicators, with outstanding customer service reflected in its SIM scores.

5.3 It said that the acquisition formed part of Pennon's broader strategy to reorganise SWW's operations ahead of the reform of the non-household retail market in 2017. Pennon expects to deliver significant benefits to both customers and shareholders through a combined retail business structure following the merger. It said that its intention was to merge BW's retail non-household and household operations with those of SWW. The combined non-household retail business would be legally separated for the purposes of retail market development.

5.4 Pennon said that, subject to regulatory approval, a new licence structure for the combined wholesale/retail activities would be put in place following discussions with Ofwat. It said that this would provide the opportunity for new forms of water company licences to be considered.

5.5 Pennon told us that this approach would deliver savings compared with maintaining existing licences. It anticipated that the merger would deliver around £[✂] in annual operating cost synergies. It said that this would result in lower bills for customers of SWW and BW. In addition Pennon told us that it would return the small company premium to BW customers in 2016/17 if the merger were to be approved. It also said that it would maintain the existing price differential between SWW and BW even if the licences were merged.

Jurisdiction

5.6 The reference was made under section 32(b) of the WIA. Under section 33 of the WIA, the CMA is required to make a phase 2 merger reference unless the value of the turnover of the water enterprise being taken over does not exceed, or as the case may be, would not exceed £10 million, or if the only

water enterprises already belonging to the acquirer are enterprises each of which has a turnover the value of which does not exceed or would not exceed £10 million.

5.7 Under section 35(1) of the Act as amended for the purposes of water merger inquiries, the first question the CMA is required to decide is whether a water merger has taken place.[60] A water merger occurs if any two or more water enterprises cease to be distinct.[61] Enterprises cease to be distinct if they come under common ownership or control.[62] A 'water enterprise' is an enterprise carried on by a company appointed under section 6 of the WIA to be a water undertaker or a sewerage undertaker.[63]

5.8 As detailed in paragraph 5.1, on 16 April 2015, Pennon, the holding company of SWW, acquired the entire share capital of BWIL, the holding company for BW. For the year ended 31 March 2015, SWW's turnover from regulated activities was £517.8 million.[64,65] BW's turnover from regulated activities for the same period was £44.8 million.[66]

5.9 We are therefore satisfied that a merger between two water enterprises has taken place within the meaning of the WIA (as amended by the Act) and that the turnover of both SWW and BW exceeds £10 million.

5.10 Finally, as the merger was referred for phase 2 investigation on 8 June 2015, the referral took place within four months of the date of the merger. The test under section 24 of the Act is therefore met.[67]

5.11 Since we consider that a water merger has taken place we are required by section 35 of the Act to consider whether the merger has prejudiced or may be expected to prejudice the ability of Ofwat, in carrying out its functions by virtue of the WIA, to make comparisons between different water enterprises (paragraph 1.2).[68]

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[60] Section 35(1) of the Act as amended by regulation 11 of the Water Mergers (Modification of Enactments) Regulations 2004.
[61] Section 23 of the Act as amended by regulation 4 of the Water Mergers (Modification of Enactments) Regulations 2004.
[62] Section 26 of the Act.
[63] WIA, sections 6 and 35(1).
[64] SWW Regulatory Accounts for year ending 31 March 2015.
[65] For the purpose of jurisdiction turnover is limited to amounts derived from the provision of products or services as a water or water and sewerage company, ie the turnover from 'regulated activities'. Consequently, any turnover attributed to other services/products offered by the water company should be excluded from the calculation of the relevant turnover for the purposes of the turnover test.
[66] BW Regulatory Accounts for year ending 31 March 2015.
[67] As amended by regulation 4 of the Water Mergers (Modification of Enactments) Regulations 2004. Section 24, as amended, provides that no enforcement action shall be taken on a merger reference under section 32(b) WIA unless the reference was made within 4 months beginning on (i) the day on which the merger took place or (ii) the day on which material facts about the merger were made public, whichever is later.
[68] As modified by Regulation 11 of The Water Mergers (Modification of Enactments) Regulations) 2004

6. Assessment of the impacts of the merger on Ofwat's ability to make comparisons

6.1 This section examines whether the acquisition by Pennon of BWIL is likely to result in any adverse impacts to Ofwat's ability to make comparisons between water enterprises. Our conclusions on whether the merger has prejudiced or may be expected to prejudice Ofwat's ability to make comparisons are then set out in Section 7.

6.2 Before making our assessment of whether there is any adverse impact on each of Ofwat's use of comparators, we set out our high level approach to the assessment of prejudice paragraphs 6.7 to 6.24) and, before that, Ofwat's approach (paragraphs 6.3 to 6.6). Given the statutory question that we are required to answer – whether the merger has prejudiced or may be expected to prejudice the ability of Ofwat, in carrying out its functions by virtue of the WIA, to make comparisons between different water enterprises – we received a considerable volume of submissions from Ofwat as well as the merger parties in this case. Further, the merger parties and Ofwat have disclosed submissions to each other and critiqued them.

Ofwat's approach to assessing the merger

6.3 Ofwat told us that the statutory test was not 'about our ability to make comparisons in the abstract; it is actually about our ability to do our job'. Ofwat particularly focused on the extent to which the merger prejudiced its ability to protect the interests of consumers, as well as to carry out its other statutory duties. Ofwat stated that 'if it is more likely than not that customers will be worse off with the merger, than without it, then there is prejudice to our ability to regulate effectively'.

6.4 In assessing the impacts of a merger, Ofwat's criteria are:[69]

(a) the extent to which the merger involves overlaps (in terms of types of activities and services);

(b) whether the merger involves the loss of an independent comparator;

(c) the extent to which the merger will change benchmarks;

(d) the number and quality of independent observations that remain;

(e) the loss of a comparator with important similarities for comparisons;

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[69] Ofwat's initial submission, Appendix A.

(f) the loss of a comparator with important differences for comparisons; and

(g) whether there are alternative approaches available to it to offset the loss of a comparator.

6.5 Ofwat's submissions to us on each area of its regulatory activities, including its detailed analysis on the impact of the merger, are discussed in each section below as well as in the appendices (as are Pennon's submissions).

6.6 Whilst accepting that synergy savings could be achieved, Ofwat does not take account of synergy savings in its assessment of impacts as there is uncertainty about what synergy savings will be achieved and when, in the absence of a formal commitment.[70]

CMA's approach to assessing the merger

6.7 The CMA's guidance on water mergers sets out the CMA's approach to water mergers.[71] In general, the CMA considers that water companies under common ownership may be expected to behave in similar ways beneficial to their common owner, since even if they remain under separate licences there will be common management at some level between them. Hence a water merger may be expected to affect the value of comparisons made by Ofwat. In each case, the CMA will assess whether the impact of the merger on Ofwat's ability to make comparisons is, or may be expected to be, adverse and significant enough to amount to prejudice.

6.8 The factors listed in the CMA's guidance are similar to the criteria used by Ofwat, and are listed below:

- the extent of common ownership or control;
- any other factors suggesting that the companies involved in the merger could remain to some extent under independent management after the merger;
- the extent to which the costs of one or all of the merging companies are, before the merger, not independent of the costs of other water companies;
- any particular similarities between the companies involved in the merger;

[70] Ofwat's initial submission.
[71] *CC9: Water Merger References: Competition Commission Guidelines* (December 2004), adopted by the CMA, paragraphs 2.2 & 2.3

- whether the company or companies being taken over are among the most efficient, for example a frontier or UQ company might mean that Ofwat would have to set softer price targets for the whole industry; and

- the number and quality of remaining independent comparators.[72]

6.9 In addition to these the CMA will also take into account any other relevant factors.[73]

6.10 Further, the CMA may consider whether it would be practicable and cost-effective for Ofwat to use alternative methods of comparison to offset partially or wholly the effects of the merger on its comparisons through developing comparative methods which are less sensitive to the number of comparators than those currently used.[74]

6.11 We have undertaken our analysis in two broad parts. First, we assessed the impact of the merger and whether that impact is likely to be adverse. Second, we have considered whether any adverse impact either individually or in combination with any other adverse impact(s) is significant enough to amount to prejudice (see Section 7).

6.12 As mentioned in paragraph 5.11 above, the statutory test is whether, in the context of carrying out its functions under the WIA, the merger has prejudiced or may be expected to prejudice the ability of Ofwat to make comparisons between different water enterprises. The level of any customer detriment is only one factor in our assessment of whether any adverse impact is significant enough to amount to prejudice. Ultimately the question of whether there is prejudice to Ofwat's ability to make comparisons is a matter of judgement based on the evidence as a whole.

6.13 Therefore, in regard to whether a combination of adverse impacts is significant enough to amount to prejudice on Ofwat's ability to make comparisons, we have not taken the view in this inquiry that the impact of the merger in one Ofwat's regulatory area (e.g. in setting retail price controls) offsets an opposing impact in another area (e.g. in setting wholesale price controls).[75]

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[72] CC9, paragraph 2.16.
[73] CC9, paragraph 2.16.
[74] CC9, paragraph 2.15.
[75] Pennon submitted that our provisional findings did not reflect any "beneficial effects" of the merger, although Pennon also submitted that "even though the conclusion means that this technically may not need to be considered" (Pennon response to provisional findings report: 'overview', page 3). Pennon submitted that in *South Staffordshire plc/Cambridge Water plc merger inquiry*, paragraph 5.119, the CC 'netted off' adverse impacts of the merger against beneficial impacts, namely a loss in precision due to a reduced number of comparators

6.14 We note that this inquiry has arisen at a time when changes to the special water merger regime are being implemented.[76] Those changes are not yet in force. This inquiry falls under the existing regime and we have carried out our assessment under the current CMA guidance.[77]

6.15 We consider that there are three ways in which the merger may be expected to impact on Ofwat's ability to make comparisons and have assessed each of these in turn:

(a) It could have an adverse impact on Ofwat's ability to make use of comparisons when setting price controls, as discussed in paragraphs 6.28 to 6.179 regarding wholesale price controls and paragraphs 6.180 to 6.212 regarding retail price controls.

(b) It could have an adverse impact on Ofwat's ability to make use of comparisons to monitor and incentivise service quality, as discussed in paragraphs 6.213 to 6.280 regarding ODIs and paragraphs 6.281 to 6.309 regarding SIM).

(c) It could have an adverse impact on Ofwat's ability to identify and spread best practice, including to make use of comparisons for ongoing monitoring and enforcement, as discussed in paragraphs 6.310 to 6.345.

6.16 In assessing the impact of the merger on Ofwat's use of comparators, we assumed that the licences of SWW and BW would be unified (and be subject to a single price control in the future), because Pennon told us that it intended to operate the directly comparable water activities of the two areas under a single licence, subject to regulatory approval.

6.17 We considered what would be the situation that would prevail in the absence of the merger, which we refer to as the counterfactual situation, and against which we assessed the effect of the merger. We found that this would be the regulated water industry with the existing number of comparators (18), with SWW and BW operating independently. We have taken account of foreseeable changes to regulation in our substantive assessment of the merger where appropriate.[78]

6.18 The analysis of impacts of the merger can be either qualitative or quantitative. Qualitative analysis seeks to assess the change to Ofwat's ability to regulate

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"netted off" against a greater probability of the merged entity becoming a benchmark relative to the merger parties absent the merger.
[76] Water Act, section 14.
[77] CC9.
[78] Competition Commission (CC) and Office of Fair Trading (September 2010), *Merger Assessment Guidelines*, adopted by the CMA, paragraph 4.3.2.

by looking at examples of how Ofwat has used comparators in the past, for instance Ofwat has used comparators to spread best practice. Quantitative analysis seeks to estimate the numerical impact of the merger on a tool, or set of tools, used by Ofwat.

6.19 There are a number of quantitative approaches to measuring impacts, although none are precise and all of these approaches require a number of assumptions. Many are measures of other effects, such as potential customer detriment, but nevertheless may be indicative of whether there is likely to be an adverse impact on Ofwat's ability to make comparisons.

6.20 The potential impact of the merger on Ofwat's ability to make comparisons between water companies will differ between Ofwat's regulatory activities. For example, in setting wholesale price controls Ofwat uses econometric models to estimate how efficiently water companies deliver water services and, from this, sets a performance benchmark to improve efficiency across the industry. For other areas of regulation – setting retail price controls and some wholesale quality of service targets – Ofwat measures directly the factors on which it bases its regulation (underlying costs to deliver retail services and outcomes of certain wholesale activities) and uses these measures to set benchmarks to target performance across the industry. For retail quality of service Ofwat does not set targets through benchmarks but rather imposes an incentive framework that results in water companies potentially receiving a reward or penalty depending on their performance relative to other water companies. We have adjusted our analysis as appropriate in light of how Ofwat makes comparisons and have considered the impact of a loss of a comparator in each.

6.21 In assessing the impact of the merger on wholesale benchmarking, ODI and SIM, we have attempted to estimate how the benchmark might change as a result of the merger.

6.22 When examining this benchmark effect for wholesale, ODI and SIM we have used both a 'static' approach and a 'forward-looking' approach in our analysis. We place greater weight on the forward-looking approach since it is this approach that analyses the merger's impact on Ofwat's ability to make comparisons between water companies at future price reviews. On the household retail benchmark we have only used a 'forward-looking' approach, due to the changes Ofwat intends to make to setting retail price controls (paragraph 6.195). The static approach uses the regulatory framework that Ofwat used in PR14 and, where appropriate, the rankings of SWW and BW have been used to determine a new ranking for the merged entity. The forward-looking approach takes account of information relevant to how the merger parties may perform in future price determinations – which could be

changes in their comparative rankings or known modifications in Ofwat's price determination approach. Indeed, we have been mindful that the merger's impact on the setting of price controls and performance targets will not be felt until 2020. For non-household retail price controls, given the upcoming reforms and uncertainty surrounding future regulation in this area, we have not undertaken an in-depth merger assessment. Ofwat agreed with this approach.

6.23 Because the various price controls and targets which were set at PR14 are in place until 2020 (apart from non-household retail price controls which are in place only until 2017), the static approach in all of our assessments reveals a purely hypothetical impact. Nevertheless it provides a useful cross-check and comparison with the results of the forward-looking analysis. This is especially important given that across all of the ways in which Ofwat uses comparators, at least one of SWW or BW were ranked highly in PR14 (and in the case of wholesale price setting, SWW and BW were the top two ranked water companies in terms of totex efficiency).

6.24 Further, wherever appropriate we have used a mix of quantitative and qualitative evidence in our assessment. We have used quantitative evidence in all of our analysis apart from assessing the merger impact on comparisons to identify and spread best practice including for ongoing monitoring and enforcement, where we have relied on qualitative evidence.

6.25 During our inquiry we have noted that Ofwat does not oppose this merger provided that the CMA could secure what Ofwat viewed as appropriate remedies. As is reported in our various substantive assessments below, Ofwat submitted to us that the merger would lead to a prejudicial impact on its ability to make comparisons between water enterprises, but in its initial submission to us Ofwat said that its 'assessment of prejudice is not so great as to lead us to oppose the merger and so we set out a range of potential remedies that could apply'.[79] However, in the absence of a finding of prejudice to Ofwat's ability to make comparisons between water enterprises the CMA is unable to consider the question of remedies.

6.26 We have assessed the merger on the basis of the evidence available in this inquiry. We have not taken a view on how many water company comparators are required in order for Ofwat to be able to make comparisons between water enterprises. Indeed, our guidance on water mergers says:

[79] Ofwat's initial submission, p5.

> in considering the impact of a merger on [Ofwat's] comparisons, the [CMA] will take into account all the factors set out above[80] and not just the effect on the robustness of econometric modelling. Hence the impact depends on the circumstances of the merger under consideration and it is not possible to state a minimum number of comparators below which [Ofwat's] ability to make comparisons would be prejudiced.[81]

6.27 We now set out the evidence on the merger's effect on each of Ofwat's different uses of comparisons between water enterprises, starting with the setting of wholesale price controls.

Wholesale price controls

How Ofwat uses comparators in wholesale price controls

6.28 Ofwat makes extensive use of comparisons between water companies in setting wholesale price controls. At PR14 Ofwat used econometric models to assess the relative performance of the 18 water companies in order to estimate wholesale cost efficiency and to set efficiency challenge targets for each water company. In this way Ofwat sets wholesale expenditure allowances for each company.

How a merger might result in adverse impacts

6.29 In PR14 Ofwat used a variety of econometric models as a part of the process of setting wholesale price controls. The models relied on historical data of the 18 comparators (opex from 2008/09 to 2012/13 and capex from 2005/06 to 2012/13). These models were used to estimate each water company's relative totex efficiency level.[82] That estimated level for each water company was compared to its actual costs to produce a ratio – an efficiency score (the lower the ratio the more efficient the water company was deemed to be). In PR14 the efficiency benchmark level was set at the UQ of efficiency scores (situated between the fifth- and sixth-ranked water companies at 93.47% of modelled efficiency). The benchmark was then used in setting water companies' wholesale expenditure allowances for the PR14 period (their efficiency challenge). The final allowance may have been adjusted for special cost factor claims for items not included in the econometric model.

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[80] See paragraphs 6.8 to 6.9 above.
[81] CC9, paragraph 2.23.
[82] Ofwat used econometric modelling in previous price reviews to set separate opex and capex efficiency challenges

6.30 Ofwat's modelling approach attempts to model relevant factors which, taken together and after adjustment for special cost factors, explain a water company's costs outside of the decision-making of the management team itself – and assumes that any costs not explained by these relevant factors are either related to management efficiency or statistical error.

6.31 By way of an example, one would expect that a water company which relies heavily on non-proximate bore holes for raw water and supplies drinking water to a sparsely populated customer base within a large geographic territory will face a different cost base from another water company which has a large proportion of water abstraction from surface water (eg rivers) and supplies drinking water to a densely populated customer base within a small, urban territory. If one were to try and make a straight comparison between these water companies outside Ofwat's modelling approach it would not be as informative due to the two companies' inherent differences. On the other hand, if one were to use Ofwat's modelling approach one would be able to control to some extent for water companies' differences and thus compare their efficiency levels.

6.32 The modelling approach is therefore designed to allow Ofwat to calculate how much revenue water companies should be allowed, both for their specific cost bases and for achieving a certain efficiency level relative to other water companies.

6.33 The econometric modelling involved a number of strands, with some of the models being highly complex (for instance some of the models used 26 variables to estimate the differences between water companies) and incorporating a number of statistical techniques and tests. The modelling is described in some detail in Appendix B. Ofwat's comparative wholesale cost benchmarking models have changed considerably at PR14 compared with previous price controls (paragraph 6.40).

6.34 We considered whether the merger may adversely impact on Ofwat's ability to make comparisons between water companies in setting wholesale price controls in two ways. The first is that the merger may result in a reduction in precision of Ofwat's modelling in that they no longer allow Ofwat to make as effective comparisons between water companies' efficiency levels. We call this the precision effect. The second is that the merger may lead to the loss of a particularly valuable comparator which harms Ofwat's ability to set a demanding efficiency challenge for the rest of the industry. In terms of Ofwat's formal cost modelling, the loss of a valuable comparator is likely to lead to the lowering of the efficiency benchmark which Ofwat uses to incentivise industry performance. We call this the benchmark effect.

6.35 Our analysis of these two possible impacts is discussed below, taking each in turn. We start with the precision effect. In assessing the impacts, we consider the analysis of precision in a statistical sense alongside the impact on Ofwat's ability to set future efficiency benchmarks.[83]

6.36 We recognise that Ofwat's approach to wholesale cost benchmarking will continue to evolve in subsequent price controls. It may develop new cost models, and could choose to use different efficiency benchmarks in the future. However, in the absence of certainty over Ofwat's future approach, we consider that looking at the impact of the merger on Ofwat's current approach to wholesale benchmarking is the most appropriate basis for our analysis. We have taken into account that Ofwat is likely to continue to develop its modelling approach in PR19 and beyond as part of our qualitative assessment of the evidence.

How a merger might result in adverse impacts: precision effect

6.37 There are two main ways in which the merger may have an adverse impact on the precision of Ofwat's econometric modelling.

6.38 The first is the loss of independent data points for statistical analysis, in this case going from 18 water companies to 17, which equates to a reduction in the number of independent observations over five years from 90 to 85 in Ofwat's econometric models. This results in an inherent loss in precision. A standard principle of statistical theory is that fewer data points will lead to less precise econometric estimates. Generally we would expect larger samples to be more likely to represent the population from which they are drawn (that is, closer to the true values they are trying to estimate). Intuitively, the larger the sample upon which an estimate is derived, the lesser the extent to which random factors, such as unpredictable events that are not controlled for in the model, affect that estimate.

6.39 The second is that SWW or BW may have specific characteristics which make them particularly useful for Ofwat in modelling wholesale costs. If BW or SWW's data provides useful variation in certain variables which helps Ofwat to identify key determinants of wholesale costs across companies, and some of this variation is lost as a result of the merger, this may result in a loss of

[83] We note that the way in which Ofwat uses comparisons in its retail price controls, ODI and SIM models, where no econometric modelling is used, means that a merger will not result in a loss of statistical precision in these (only some qualitative loss of precision in the sense that a numeric average becomes more influenced by each individual data point as the number of data points decrease). Therefore, we have only assessed the precision effect in relation to wholesale price controls. (Europe Economics (18 May 2015), *Valuing the impact of mergers and identifying undertakings in lieu*, p21). In PR14 Ofwat did use econometric modelling to assess bad debt adjustments to the retail CTS but Ofwat told us that it would not do so in the future and so it is not necessary to examine the merger impact on precision of bad debt adjustments in this inquiry.

precision in Ofwat's models. On the other hand, if the merger does not lead to a significant loss in variation, or if the variation is driven by company-specific factors which are less important in estimating cost drivers for the industry as a whole, then we consider that the merger is less likely to lead to a significant loss in precision (and indeed may even improve precision).

6.40 We note that Ofwat made a number of significant changes to its wholesale cost modelling at PR14 compared with previous price controls which are relevant to considering the potential loss of precision resulting from the merger:

- First, it introduced the use of panel data, with the models including five years' of data for each water company in each of Ofwat's five main econometric models.[84] Using panel data in its econometric models allowed Ofwat to use both variation in company data over time as well as the variation in data between water companies.
- Second, it modelled combined totex, whereas previous reviews had considered opex and capex separately.
- Third, Ofwat used a UQ benchmark as the basis for its efficiency targets, whereas previous reviews had used different approaches (eg a frontier target for opex and a median cost target for capex).

Pennon's submissions on the precision effect

6.41 Pennon's submissions and views are discussed throughout our substantive analysis, below. Further, some of Pennon's technical submissions on the appropriate analytical approach to precision are included in Appendix D. Pennon argued that the merger could have a potentially beneficial impact on precision.

Ofwat's submissions on the precision effect

6.42 Ofwat's submissions and views are discussed throughout our substantive analysis, below. Further, some of Ofwat's technical submissions on the appropriate analytical approach to precision are included in Appendix D.

6.43 Ofwat submitted that the merger would lead to a reduction in the precision of its wholesale benchmarking models. It told us that quantifying that reduction

[84] Panel data is data collected for a number of dimensions (in this case, 18 water companies) over several time periods.

was inherently difficult and more difficult than previous merger inquiries due to the complexity of the models used at PR14.

6.44 Ofwat noted that having less confidence in its models could lead it setting less stringent benchmarks. Specifically, it argued that if the precision in its overall econometric totex estimate was reduced, this might lead to water companies requesting a specific adjustment to their cost allowance (and Ofwat would therefore be more susceptible to accepting cost adjustments that made price determinations less demanding or setting a less challenging risk and reward package) or Ofwat having to reduce the level of its efficiency challenge under its benchmark.

6.45 Ofwat told us that this loss in precision might prevent it from being able to set more demanding benchmarks[85] in future and the CMA needed to take that impact into account. Ofwat told us: 'the work we have carried out in the context of this merger shows while we would continue to expect to use a UQ target there are nonetheless important impacts on precision. For instance, the loss of a comparator would make it harder to adopt an upper quintile challenge.' Ofwat also noted that the price limits it set took into account a number of factors in the round, where the confidence that Ofwat placed in these models was only one factor.

CMA's analytical approach to the precision effect

6.46 We have firstly assessed whether the loss of independent data points would lead to a reduction in statistical precision, in this case going from 18 water companies to 17 (paragraph 6.38). The approach that we adopted in making this assessment is discussed below.

6.47 Although we would generally expect the use of panel data to reduce the impact of the loss of a comparator on the overall precision of Ofwat's models, compared with a model based only on cross-sectional data, we have examined the extent to which the loss of a comparator reduces the degree of useful variation in the data.

6.48 To assess the merger's impact on the precision of Ofwat's models we have looked separately at the statistical loss in precision and any adverse impact that would arise from that loss in precision. This is because, while any loss of a comparator can, to some extent, reduce the level of precision around a model's estimate, we have sought to identify what impact this might have on Ofwat's ability to use comparative benchmarking models in future.

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[85] Such as an upper quintile for example.

6.49 We have examined precision using four commonly used statistical measures of precision: standard errors, confidence intervals, prediction errors and prediction intervals.[86]

6.50 The confidence interval gives an estimate of the range within which we can be confident that the true value of the coefficient estimate lies with a given level of probability.[87] The width of a confidence interval is determined by the standard error. The standard error can be thought of as a statistic which provides an estimate of the uncertainty that should be attached to an estimate. The size of a standard error is determined by a combination of:

- the number of data points upon which a coefficient estimate is based;
- the amount of variation in the data used to calculate a coefficient estimate;
- how closely the overall econometric model estimate fits the current data; and
- the complexity of the overall econometric model estimate being calculated, in terms of number of coefficients and the interactions between them.

6.51 In addition to standard errors and confidence intervals one can also look at prediction intervals and prediction errors to assess the precision in Ofwat's model. Prediction intervals provide the range within which we can be confident that the true value of the model-predicted values for each water company lies with a given level of probability. And just as standard errors are used to derive confidence intervals, prediction errors are used to derive prediction intervals.

6.52 Assessing the precision of Ofwat's models is very challenging given the complex nature of Ofwat's econometric modelling (as noted by Ofwat itself, see paragraph 6.43).[88] In particular, one cannot completely separate out the change in precision from the change in variation in water company efficiency due to the merger. This is because water company efficiency is not directly estimated by Ofwat's econometric models and is instead reflected in the

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[86] Confidence intervals and prediction intervals, and their related measures of standard errors and prediction errors respectively, are all measures of precision. Confidence intervals and standard errors assess the level of confidence one can ascribe to the regression line estimated from Ofwat's models. Prediction intervals and prediction errors assess the level of confidence one can ascribe to using that model to estimate a particular future outcome (eg a level of wholesale cost efficiency).

[87] To give an example, a 95% confidence interval for a parameter might stretch from 2 to 6, suggesting that given the extent of variation in the data, we can be 95% confident that the true value of the parameter lies between 2 and 6. The confidence width in this example would be 4 (the upper bound of the confidence interval minus the lower bound).

[88] The current models are considerably more complex than existed at the time PR04 and PR09.

model residuals (ie the difference between each company's actual costs and the costs predicted by the model).[89] If a merger leads to a narrower range of relative efficiencies between water companies, this would entail a reduction in the average size of the residuals estimated by the model, which might suggest that the model is becoming more precise. However, ideally the analysis should assess the extent to which the merger leads to a reduction in the precision with which Ofwat can model the other key determinants of wholesale costs aside from company efficiency, rather than how the merger affects the distribution of relative efficiency performance. The difficulty for our merger analysis is that the residual will also contain statistical error, as it does in any econometric model. So there is no way of definitively accounting for the reduction in water company efficiency variation due to the merger without conflating some of this with a reduction in statistical error variation.

6.53 We have looked at four methods to estimate the statistical loss in precision:

- The General Approach: we considered Ofwat's and Pennon's analyses using the 'General Approach' which measures the loss in precision related to a loss of generalised data points. This approach does not take account of the specific parties to the merger. We have also undertaken our own analysis using the General Approach.

- The Specific Approach: we considered Pennon and Ofwat's analyses of the merger under the Specific Approach which measures the loss in precision by re-estimating Ofwat's models under a simulation of the specific merged entity, thereby taking account of the parties to the merger.

- Bootstrapping: we considered Ofwat and Pennon's bootstrapping analysis which involved estimating the loss of a comparator on the precision of Ofwat's models under different random simulations of the current data set.

- A Qualitative Approach which looks at the theoretical statistical reduction in precision that may arise from the loss of BW's independent observations.

6.54 We note that the scale of loss in precision identified under these approaches does not have a direct and measurable effect on the outcome of Ofwat's comparative regulation. In measuring the reduction in precision, we are seeking to identify the scale of the change in the accuracy of Ofwat's models. We have followed Pennon and Ofwat in measuring this as a percentage effect, ie how much does the merger increase the measure of uncertainty

[89] This is the core approach to the design of the models. That is, the models account for the different factors which explain differences in costs between water companies, with any remaining differences between water companies being considered to be differences in how efficient they are.

around Ofwat's cost estimates. This measure does not translate directly into an impact on the benchmark which Ofwat uses in setting price controls. The increased uncertainty around the cost estimate could lead to estimated costs being either higher or lower following the merger, so the measure should not be interpreted as a direct estimate of consumer detriment from loss of precision. Instead, it indicates the extent to which Ofwat's ability to make comparisons is subject to increased uncertainty, which may result in Ofwat being more susceptible to accepting cost adjustments that make price determinations less demanding.[90]

6.55 In addition we have also considered evidence on whether there are offsetting or mitigating strategies available to Ofwat for it to change its approach if a significant reduction in precision were to arise. Namely:

- Pennon's submissions on how increased data collection or small changes in Ofwat's modelling could potentially lead to more precise estimates that would counteract any loss in precision;
- Pennon's and Ofwat's submissions on how Ofwat regulates with fewer comparators in wastewater; and
- evidence of how Office of Gas and Electricity Markets (Ofgem) and the WICS regulate with fewer comparators in setting their respective benchmarks.

6.56 We start by discussing the General Approach.

CMA analysis of the precision effect

The General Approach

6.57 The General Approach estimates the impact of a merger by examining the impact of a reduction in sample size on the standard error, a measure of the model's precision. The General Approach does so due to the reduction in the number of data points (in this case as a result of a merger) rather than the specific parties' data points.

6.58 According to statistical theory the impact of the merger in terms of a loss of generalised data points can be measured by changing the degrees of freedom in standard errors/prediction errors. The degrees of freedom in

[90] Moreover, we do not consider that our analysis of the precision effect in this case can be directly compared to that in previous water merger cases. This is because of the changes Ofwat has made to its wholesale benchmarking approach, particularly the introduction of menu regulation and panel data (paragraph 6.40) and that under the former frontier benchmarking approach Ofwat made explicit allowance for error.

standard errors/prediction errors are measured according to the sample size and the complexity of the econometric estimate. Because the merger reduces the sample size by five data points one can simulate the loss of five 'generalised' data points (equivalent to the loss of a single comparator over five years) by adjusting the number of degrees of freedom used in standard errors, prediction error, prediction intervals and confidence intervals.[91]

6.59 The General Approach involves looking at how the loss of a comparator following a merger is likely to affect a given 'error band' around the benchmark in Ofwat's current wholesale models. This can be approximated by perturbing the coefficient estimate for the slope in Ofwat's models by plus or minus one standard error, and then repeating this calculation for the removal of data points.[92] In principle, the General Approach thus measures how much more or less demanding Ofwat's efficiency benchmark for each water company might become post-merger if Ofwat's estimate were to be out by a given amount of error.

6.60 The main limitation of the General Approach is that the estimated increase in the error band (ie greater imprecision) due to the loss of the data points is not related to a particular merger, that is the loss of specific parties' data as opposed to the loss of a general data point.

6.61 Both Pennon and Ofwat had different interpretations of when and how to use the General Approach. We have assessed their arguments in this regard, below. We have also applied our own General Approach.

- *Pennon's submissions on the General Approach*

6.62 Pennon considered that the General Approach (as used by the CC in past mergers which estimated the precision effect of cross sectional models) is not appropriate to the current inquiry since, in Pennon's view, it was only applicable to Ofwat's unit cost models due to the complexity in Ofwat's other models.[93] Therefore, if one were to apply a General Approach to the analysis of this merger one could only do so to a subset of Ofwat's models. However, because it was only applied to a subset of the models and further did not account for the specifics of the merger in question, Pennon emphasised that

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[91] Pennon's initial submission, p18.
[92] With standard errors adjusted for the post-merger reduction in a degrees of freedom. Perturbing by plus or minus one standard error is a method for generating an error band which can be compared before and after the merger. It is an ad hoc assumption in that it would be possible as an alternative to perturb by more or less than a standard error to produce a different error band, but this is unlikely to have a significant impact on the results, and is consistent with the approach taken in past water merger cases investigated by the CC.
[93] Pennon's reasoning is outlined in more detail in Appendix D.

any results from this approach should be interpreted with caution. A fuller explanation of Pennon's position is in Appendix D.

6.63 Pennon did, however, submit results of applying the General Approach to two specifications (out of four specifications used by Ofwat[94]) of two (out of three[95]) of Ofwat's unit cost models. It told us that the results show that on average post-merger the total cost difference with respect to the average cost line would become less precise (ie the cost difference would widen) if Ofwat's estimate was off by plus or minus one standard error in two specifications of two unit cost models (ranging from 2.9% to 8.4%) and more precise in one specification of one unit cost model (of 20%), such that the average precision under the approach show a small improvement. However, Pennon placed little weight on these results. The results are in Appendix D.

- *CMA view on Pennon's submission on the General Approach*

6.64 We consider that Pennon's application of the General Approach is useful in interpreting the likely impact of a reduction in precision on the two specifications of the two unit cost models it considered. However, given that Pennon's analysis only covers two models used in a small part of Ofwat's modelling, we placed limited weight on the results.

- *Ofwat's submissions on the General Approach*

6.65 Ofwat submitted estimates of a reduction in precision under the General Approach in two parts:

- a loss of precision in its overall econometric totex estimate (which predicts each water company's costs according to their cost drivers which is used to derive the UQ benchmark); and
- a loss of precision in the UQ benchmark itself (the starting point in Ofwat's calculation for each water company's cost allowance under its price reviews).

  - *A loss of precision in the totex estimate*

6.66 Ofwat stated that a loss of precision in its overall totex estimate made it harder to have confidence in the benchmark it set. Specifically, it argued that if the precision in its overall totex estimate was reduced, this may lead to

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[94] Pennon noted that the other two specifications of Ofwat's four were simple unit cost ratios where the regression specifications Pennon considered were the other two specifications regression equivalents.
[95] Where BW was not used in Ofwat's lead reduction unit cost model.

water companies requesting specific adjustment to their cost allowance or Ofwat having to reduce the level of its efficiency challenge under its benchmark.

6.67 To illustrate the level of increased imprecision in its models due to the loss of a comparator, Ofwat looked at the precision of its overall econometric totex estimate by creating an error band (which can be considered as providing indicative boundaries of imprecision) around it and seeing how that error band increased due to the loss of five generalised data points (representing the five years that would be lost due to the loss of BW as a comparator). This is explained in Appendix D, paragraphs 24 to 32.

6.68 Ofwat then quantified its estimate for a loss in precision by summing the residuals between observations for water companies' actual costs and their model-predicted costs using the upper and lower bounds of its error band.[96,97] Using this approach Ofwat estimated that the error band would increase by around £32 million over five years (£6.3 million per year) as a result of the merger. It argued that this would amount to a 7.5% reduction in precision, calculated by dividing £6.3 million by the current level of annual inefficiency (£84 million) (see Appendix D).

- *A loss of precision in the benchmark*

6.69 Ofwat said that capturing the precision of the benchmark was inherently difficult. Efficiency confidence intervals were not linear and there was not sufficient precedent of using them in regulation.

6.70 To isolate the precision of the benchmark, bearing in mind that the choice of benchmark is itself based in part on the level of confidence in the current econometric totex estimate, Ofwat looked at different percentage adjustments from the overall econometric totex estimate to the estimate's UQ benchmark under different scenarios for the amount of error in Ofwat's overall econometric totex estimate.[98]

6.71 Using this approach, Ofwat estimated that the merger would lead to a 4.7% reduction in precision of the UQ benchmark. It submitted a monetised value of this reduction in precision of £7.4 million per year.[99]

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[96] The residuals measure how much variability in the dependent variable – wholesale costs expenditure – is not explained by the variables used, and therefore give an indication of any increased imprecision in the models.
[97] Ofwat did this by perturbing the econometric totex estimate by plus and, separately, minus one prediction error.
[98] Ofwat's full calculation is in Appendix D.
[99] This should not be interpreted as a customer detriment figure as a reduction in precision may not affect the actual benchmark being set.

- *CMA view on Ofwat's submissions on the General Approach*

6.72 We agree that a General Approach to assessing the reduction in precision can be a useful way of quantifying the potential impact of the merger. However, as with any econometric modelling we consider that there are some limitations in the General Approach as submitted by Ofwat.

6.73 First, in quantifying the reduction in precision in its overall econometric totex estimate, Ofwat has used a measure of precision involving the estimated increase in mean variation of the model prediction as a percentage of Ofwat's current estimate of industry-wide inefficiency. It is unclear how changes in this measure equate to a statistical reduction in precision in Ofwat's current econometric estimate.

6.74 Second, as observed by both Ofwat and Pennon, Ofwat's more advanced econometric modelling used in PR14 has introduced several complexities in applying the General Approach. Most notably, the increase in the error band estimated under the General Approach is likely to be affected by collinearity, which refers to the situation where there is a statistical relationship between certain cost drivers. This can lead to artificially large calculated standard errors on the coefficient estimates, and may also affect the predicted change in errors resulting from removing a data point.

6.75 Third, the level of precision under the General Approach does not account for the variation in company efficiency, an econometric limitation in Ofwat's models.

6.76 We also have further reservations regarding Ofwat's estimates of a reduction in precision in its benchmark. We agree with Ofwat that capturing the precision of the benchmark is inherently difficult. In particular, we note that it is unclear how changes in the adjustment from the overall econometric totex estimate to the UQ benchmark relate to a reduction in precision in Ofwat's benchmark. We therefore have found it unclear as to how to interpret Ofwat's results in relation to the reduction in precision of the UQ benchmark, and have therefore placed limited weight on this result.

6.77 Given our reservations about Ofwat's measure of the percentage loss of precision outlined in paragraphs 6.73 to 6.76, we also considered an alternative formulation based on how the prediction errors in Ofwat's models might expand post-merger under the General Approach. In doing so, we followed Ofwat's methodology, but applied it to the predicted change in the error band around the central totex estimate rather than to the change in the error band around the predicted inefficiency scores. We considered that this

was a relatively intuitive measure of loss of precision, which could be compared with the results obtained by Ofwat and Pennon.[100]

6.78 To do this we first considered the percentage difference between Ofwat's current econometric totex estimates' predictions and the predictions when Ofwat's estimate was adjusted by plus or minus one prediction error (following Ofwat's methodology in its generalised approach). We found that this led to a change in each water company's predicted costs of 4.90% on average, which can be interpreted as a measure of the error around the prediction in the pre-merger scenario.[101]

6.79 We then repeated the same calculations for companies' predicted costs with a new prediction error, adjusted for a loss of generalised data points due to the merger.[102] Our results suggested that the measure of error around each company's predicted costs would increase to 5.08% on average post-merger.

6.80 Taken together, the pre- and post-merger results indicate that the merger might lead to a reduction in precision in Ofwat's totex estimate of around 4% (based on a 0.18 percentage point expansion in the error band around Ofwat's econometric totex estimate from 4.90% to 5.08%).[103] This gives an alternative indicator of the percentage loss of precision, compared with the 7.5% estimated by Ofwat. However this alternative approach gives the same absolute value for the reduction in precision, equating to all water companies' cost estimates being a combined £6.3 million less precise in total in any given year. This in turn suggests that the prediction of each water company's costs is around £350,000 less precise, on average in any given year.[104] The increased uncertainty around the cost estimate could lead to predicted costs being either higher or lower following the merger, so this measure should not be interpreted as a direct estimate of consumer detriment from loss of precision. To place this in some context we note that the annual turnover of all water companies in England and Wales combined is around £5.8 billion, of

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[100] Our approach estimates precision as the percentage difference between Ofwat's current totex estimate for each company and alternative scenarios in which the model is perturbed positively or negatively by one prediction error. We compare this average precision estimate before and after the merger, and interpret the difference as the change in precision resulting from the merger. Ofwat similarly perturbed the model by plus or minus one prediction error to generate an 'error band', so our approaches are very similar. However, Ofwat used a different measure of precision from us, namely the mean deviation in estimated efficiency scores between the two scenarios and the core model estimate. We consider that it is simpler to look directly at the change in prediction errors from the model, rather than looking at how predicted levels of inefficiency change.
[101] Based on an overall average of the percentage difference between the current econometric totex estimate and the estimate in the plus or minus one prediction error scenarios.
[102] Calculated by reducing the degrees of freedom in the prediction error.
[103] Our analysis found a reduction in precision of 3.7% which we have rounded to 4%.
[104] This calculation is based on the average loss in precision across the current 18 companies as our modelling keeps the existing data points fixed and just adjusts the level of precision.

which wholesale activities account for approximately 90% (or around £5.2 billion).[105]

6.81 Given that our approach is based on Ofwat's methodology, we note that it will have some of the same drawbacks as Ofwat's General Approach. In particular:

- it does not tell us how the merger might impact on precision in the UQ benchmark that Ofwat used at PR14;
- there is no commonly agreed threshold under which the reduction in precision in Ofwat's overall econometric totex estimate can be judged; and
- finally, the General Approach is likely to overestimate the impact on precision due to the econometric limitations noted in paragraph 6.74.

The Specific Approach

6.82 The Specific Approach re-estimates Ofwat's models under a simulation of the specific merged entity to identify how a specific loss of a comparator changes the confidence interval widths in Ofwat's models. Therefore, unlike the General Approach the Specific Approach takes into account the particular parties to the merger, here SWW and BW.

- *Pennon's submissions on the Specific Approach*

6.83 Pennon estimated the change in precision due to the merger by looking at differences in the precision of the predictions with inclusion of BW and SWW separately relative to the precision of the prediction for the merged entity.[106]

6.84 In doing so, it calculated prediction intervals, error bands around each predicted value of the model, for the predicted values for each of the 18 water companies assessed at PR14 (including BW and SWW) and the merged entity. It then compared the average size of prediction intervals across all water companies in two scenarios: one using the 18 water companies assessed at PR14; and the second with the merged entity, instead of BW and SWW, together with the 16 other water companies.

6.85 Based on these estimated average prediction interval widths Pennon then constructed 'confidence intervals' around each econometric model by using

[105] Pennon submitted that £6.3 million accounts for 0.1 to 0.3% of the cost base of the water companies that set the UQ.
[106] Comprising a weighted combination of both BW's and SWW's characteristics.

the average prediction interval widths in the pre and post-merger scenarios as a proxy for the confidence interval width.

6.86 Using the above approach, Pennon's results (reported in Appendix D) show that on average there is a contraction in confidence interval widths in Ofwat's models. This suggests that there might be a post-merger improvement in precision. Those results show possible improvements across some models but also possible reductions in precision ranging across other models. Pennon told us that these results suggested that, on average, the estimated change in precision under the Specific Approach suggested that uncertainty in Ofwat's econometric model predictions was likely to improve post-merger.

6.87 Pennon also looked at various statistical tests gauging how the accuracy of Ofwat's econometric estimate changed from the pre-merger estimation to its post-merger re-estimation. Pennon found that the main measures of 'goodness of fit' were unchanged post-merger, and that there was some evidence in these 'goodness of fit' tests that suggested that the precision in Ofwat's unit cost models would somewhat improve post-merger.[107]

- *CMA view on Pennon's submissions on the Specific Approach*

6.88 We have some reservations about Pennon's interpretation of the Specific Approach because it may not accurately account for the merger-related change in relative efficiency variation between water companies.

6.89 A characteristic of Ofwat's cost models is that efficiency is not measured directly, but is instead estimated on the basis of each water company's residuals (ie the difference between costs predicted by the model and a company's actual costs). These residuals combine both relative cost efficiency and modelling error. This means that in addition to including some level of random error, each of Ofwat's modelled company residuals – from which Ofwat derives its efficiency scores – also includes a measure of relative cost efficiency. Therefore there is no way of distinguishing between efficiency and error, and so one cannot measure accurately the relative efficiency between water companies. So conventional estimates of precision cannot isolate and account for reduced variation in efficiency.

6.90 When Pennon estimates the change in confidence intervals (or any other 'goodness of fit' measure) resulting from the merger under the Specific Approach, the results will reflect a combination of the change in statistical

[107] Goodness of fit tests measure the difference between observed values and those values estimated by the model. Pennon also performed other statistical tests that looked at the impact of the merger on a number of diagnostic tests. These indicated that the merger has a minimal impact on precision.

precision of Ofwat's models due to the loss of a comparator and the change in relative efficiency variation between water companies. If the merger leads to a reduction in variation in relative efficiency between companies, this might be expected to reduce the confidence intervals around Ofwat's model estimates and hence lead to an apparent increase in precision as a result of the merger. However, ideally we want to measure the change in statistical precision, controlling for the change in distribution of relative efficiency. This problem is particularly relevant to the effective loss of BW as a comparator as it is the most efficient water company according to Ofwat's efficiency ranking (although we do acknowledge that the equivalent of BW's efficiency ranking in each of Ofwat's models does vary somewhat from model to model).[108]

6.91 Pennon argued that we had overstated the impact of this conflation between efficiency and error. In particular it noted that it had estimated the reduction in precision while keeping the coefficient estimates in the model fixed, and it considered that the current relative ranking of BW suggested that the reduction in variation due to the merger was likely to be small. However, we consider that these arguments do not fully address our concerns about the Specific Approach. In particular, although keeping the coefficient estimates fixed in its analysis means that Pennon is controlling for possible shifts in the benchmark resulting from removing BW's data, we do not consider that it fully controls for the differences in the distribution of relative efficiency between BW, SWW and the merged entity, which will in turn distort the prediction errors upon which Pennon's confidence intervals and precision estimates are based.

6.92 Although we acknowledge that the results of our General Approach do not account for any change in relative efficiency we consider that since Pennon's Specific Approach may account for this change erroneously, its results may not be robust. So, for the above reasons, we have not placed weight on the results of Pennon's Specific Approach.

- *Ofwat's submissions on the Specific Approach*

6.93 Ofwat's interpretation of the Specific Approach had two parts to it:

[108] As a response to this critique Pennon submitted two arguments that explain why it does not account for the variation in efficiency, namely because *(a)* it estimated the reduction in precision while keeping the coefficient estimates fixed, and *(b)* it considered that the current relative ranking of BW suggested that the reduction in variation due to the merger was likely to be small. We disregarded these arguments for the reasons set out in Appendix D.

- First, it looked at the specific characteristics of BW's data points to identify what characteristics it had that would be likely to have the greatest impact on coefficient estimates if BW were lost.

- Second, it looked at the difference between the forecast values for each company based on a re-estimation of their model with a simulated merged entity (replacing the merging parties' information) and a re-estimation after dropping BW's observations.

6.94 Ofwat submitted that the merger would result in a 0.21% decrease in precision. However, relative to the General Approach it placed less weight on this precision estimate since Ofwat felt that it was less reliable. Ofwat told us that this was because the General Approach allowed one to examine the impact on precision of moving from 18 to 17 water companies whereas the Specific Approach was analytically more difficult since it incorporated two dynamics: a shift in the UQ level as well as an impact on precision.

- *CMA view on Ofwat's submissions on the Specific Approach*

6.95 We have some reservations about Ofwat's analytical approach. We consider that Ofwat's approach in both parts, even when trying to compare the level of precision pre and post-merger, risks conflating the benchmark effect with the precision effect (as Ofwat acknowledged). By comparing the inefficiency levels pre- and post-merger it is looking at how less demanding the benchmark would have become as a direct result of the merger – and not as a result of reduced imprecision.

6.96 For this reason, we have not placed weight on the results of Ofwat's Specific Approach. Nonetheless, we do note that Ofwat submitted to us that

> … we assess the loss of precision to our models to be in the range 0.21% to 3.8%. We consider that this, of itself, would not have prevented us from using the wholesale water cost models at PR14. However, the loss of Bournemouth Water 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.[109]

[109] Ofwat's initial submission, p5. The 0.21% figure refers to the Specific Approach and the 3.8% figure refers to the General Approach. Note that the 3.8% was calculated differently from the 7.5% figure submitted to us by Ofwat (paragraph 6.68).

In considering a reduction in precision, as well as in considering other aspects of this case, we have been mindful that this merger reduces the number of independent water company comparators from 18 to 17. We are of the view that we could not take into account further mergers on Ofwat's ability to make comparisons a part of our consideration in this inquiry.

Bootstrapping

6.97 In Pennon's and Ofwat's initial submissions both parties undertook bootstrapping simulations to estimate the pre-merger and post-merger change in the standard error. The rationale for this approach is that the estimate of the standard error in Ofwat's models may be biased since it is based on a small sample.

6.98 These bootstrapping simulations tried to find an estimate of the standard error by estimating Ofwat's models under different random simulations of the current data set. In this way, the bootstrapped estimates should be less susceptible to bias than conventional estimates of standard errors (such as those used in the General Approach set out above).

6.99 By comparing the bootstrapped standard errors with the econometric totex estimated standard errors, both parties obtain a measure of bias in the latter. And, to look at the impact of the merger, both parties compare the current standard error bias in model estimates calculated using all 18 water companies at PR14 with the standard error bias in model estimates where the merging parties are replaced with a simulated merged entity.

6.100 The parties argue that looking at how the bias in the standard error changes could provide some measure for the reduction in precision due to the merger.

6.101 Notwithstanding this, we do not place weight on either of Pennon's or Ofwat's bootstrapping results. We consider that it is unclear how looking at how the bias in a measure of precision (a standard error) changes post-merger provides a statistical estimate of the degree to which there is a merger-related loss in precision. In particular we note that bias in standard errors indicates the degree of inaccuracy in the estimation of precision, but does not provide a measure of the level of precision in the model.

6.102 We also have noted some technical limitations in both parties' estimates. These are discussed further in Appendix D.

Qualitative Approach

6.103 Due to the limitations inherent in the General, Specific and Bootstrapping Approaches discussed above, we have also considered an alternative Qualitative Approach to analysing the loss in precision in Ofwat's wholesale econometric models. This approach focuses on whether, as a result of the merger, there is likely to be a loss of variation in the data used in Ofwat's models, and how this might affect the precision of those models.

6.104 The motivation for this analysis is that Ofwat's ability to identify the main determinants of wholesale costs depends on there being relevant variation in the observed data across companies and over time.[110] If a merger results in the removal of comparator data which provides valuable variation in Ofwat's current models, then this might suggest that the merger is more likely to make Ofwat's future cost modelling less precise. On the other hand, if the merger does not lead to a significant loss in variation, or if the variation is driven by company-specific factors which are less important in estimating cost drivers for the industry as a whole, then we consider that the merger is less likely to lead to a significant loss in precision (and indeed may even improve precision).

6.105 In our view it is likely that the merged entity will more closely resemble SWW than BW in light of their relative size, therefore we have focused our analysis on the potential loss of variation in BW's data as a proxy for the overall impact of the merger.

6.106 Our approach identifies those individual variables used in Ofwat's models which are most affected by the removal of BW as a comparator. In particular, we have assessed:

- the extent to which BW has certain characteristics which, when lost, would significantly reduce the variation in certain variables upon which Ofwat's main econometric models rely; and

- the extent to which the variation in Ofwat's data lost through the loss of BW as a comparator is important in Ofwat's econometric modelling.

6.107 In order to assess the extent to which the variation in Ofwat's data would be lost due to the loss of BW as a comparator, we estimated the percentage

[110] To use a hypothetical example, suppose there was no variation in network density between companies. In this case, an econometric model would not be able to identify any impact of network density on cost, even though network density might plausibly be considered to be an important economic driver of wholesale costs.

change in the average standard deviation of all water companies' characteristics[111] used in Ofwat's models after removing BW's data.[112]

6.108 The analysis, which is set out in full in Appendix D, shows that removing BW's data led to an increase of more than 10% in the standard deviation of the following four variables in the model (the impact on the standard deviation is shown in parentheses): *(a)* the drinking water usage per property (47%); *(b)* the proportion of water input from river abstractions (17%); *(c)* the proportion of usage by metered non-households (73%); and *(d)* unplanned interruptions (13%). For the other 22 variables used in Ofwat's five main econometric models, we found that there would be a smaller impact than 10%.

6.109 To assess how important the loss in variation in the four variables might be for Ofwat's econometric modelling, we first looked at the extent to which BW's characteristics suggested that it was an outlier in these four variables.[113] We concluded that BW was likely to be an outlier in one of the four variables – the proportion of usage by metered non-households – because of the significant impact of one large customer (Esso Fawley) on BW's data. This is also the variable in which Ofwat is losing most of its between-company variation as a result of the merger. For the other three variables, we did not find reasons to suggest that BW's data should be treated as an outlier.

6.110 We then looked at Ofwat's use of these variables in its current PR14 econometric modelling. We found that two out of these three variables[114] are only used in one of Ofwat's five main econometric models for PR14, which only accounts for one-third of Ofwat's overall econometric totex estimate. We also noted that in this same econometric model, the output derived from one of the two variables, proportion of drinking water usage per property, has a counter-intuitive result.[115] This suggests that for these two variables the removal of BW does not significantly reduce variation in Ofwat's data. We found that there may be some useful variation lost in relation to the final

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[111] Note that water companies' characteristics are not the same as the cost drivers in Ofwat's model. For example, some of the characteristics may arise through multiple different variables if there are economies of scope.
[112] Where pre-merger the standard deviation was based on 18 water companies and post-merger it is based on 17.
[113] As noted above, the reason for considering whether BW is an outlier is that, if BW's data is driven mainly by company-specific factors, then the reduction in variation due to the merger would be less likely to affect the precision with which Ofwat's models can identify industry-wide determinants of wholesale costs.
[114] Unplanned interruptions and the proportion of drinking water used by metered non-households.
[115] According to Ofwat (2014), *Cost assessment – advanced econometric models*, the results indicate that, all else being equal, the greater the proportion of drinking water usage per property the lower will be a water company's costs.

variable – proportion of water input from river abstractions – but that the scale of the reduction in variation is limited.

6.111 Finally we also looked at the nature of the three variables where BW was not an outlier (ie excluding the proportion of usage by metered non-households), to assess how significant the loss in the current level of variation might be in the future. We considered that the variation in one of the three variables, unplanned interruptions, was likely to be considerably different in future, as the management of each water company may become more or less adept at managing unplanned interruptions.

6.112 Taking the above analysis as a whole, although there is likely to be some loss in useful variation in Ofwat's data in a small number of variables due to the merger, any resulting loss in precision in Ofwat's overall cost models is likely to be small.

Possible options available to Ofwat in the event of a significant loss in precision

6.113 As mentioned in paragraph 6.55 we considered possible offsetting or mitigating strategies available to Ofwat in the event of a significant loss in precision. A loss in precision due to the merger might not necessarily hamper Ofwat's ability to set an effective wholesale cost benchmark if Ofwat has sufficient mitigating and offsetting strategies available to it. We have received submissions relating to the following:

- Pennon and Ofwat's submissions on how Ofwat regulates with fewer comparators in wastewater modelling.
- Pennon's submissions on how increased data collection (such as collecting data over longer periods) and other small changes to Ofwat's modelling could lead to more precise estimates that would counteract any loss in precision in regulating the provision of water.
- Evidence of how other economic regulators use fewer comparators in setting their own benchmarks, in particular WICS and Ofgem in circumstances where they have fewer comparators than Ofwat does in drinking water providers.

6.114 Pennon compared the precision of Ofwat's water cost modelling with wastewater modelling, where Ofwat used ten comparators in its econometric modelling to set its wastewater UQ benchmark. Pennon's analysis showed that post-merger Ofwat would still have a greater level of precision in its water modelling than it currently has in its wastewater modelling.

6.115 Pennon also looked at whether, as a mitigating strategy, it is possible to offset model attrition by extending the modelled period, thereby providing more data points. By using the historical data currently used in PR14 (taken from the 2009–2013 period) combined with the equivalent data that would be used in PR19 (taken from the 2014–2019 period), Pennon argued that Ofwat could achieve a more accurate estimate of its models. Pennon found that if Ofwat were to simultaneously drop a comparator (for example, because of a merger) and extend the modelling period by one year, theoretical precision could be improved by 8%, and if two years were added to the modelling period, it believed precision could increase by as much as 17%.

6.116 Another amendment to Ofwat's models proposed by Pennon would be to change the cost drivers used in Ofwat's model, as some cost drivers used in Ofwat's models have a counter-intuitive or statistically insignificant relationship with water companies' cost expenditure. Given that standard errors increase with the number of cost drivers used in Ofwat's models it proposes that one alternative way of increasing precision may be to simply exclude some variables in Ofwat's modelling.[116]

6.117 We also received evidence from other regulators themselves. WICS told us that in the past it had used Ofwat's econometric modelling because there were substantial efficiency gaps between England and Scotland. But by 2009, WICS said it had become increasingly difficult to robustly identify significant gaps. WICS also told us that it was sceptical about the number of comparators required by Ofwat for modelling. WICS told us that Ofwat could use Scottish Water as a comparator when setting future benchmarks. Using Scottish Water would replace any 'generalised' loss in precision that would arise due to the merger (as calculated under the General Approach).

6.118 Ofgem told us that it could carry out comparisons with a small number of operators (four gas distribution companies and six electricity distribution companies) although it conceded that it was difficult and required a range of qualitative and quantitative evidence. It also used sensitivity analysis where this evidence included data from licensees with common ownership. Ideally it would like to preserve the comparator data available or have more comparator data to handle the complex nature of energy networks (eg managing changes in demand and generation and requiring long-term planning and investment).

6.119 We considered each of the above carefully. However, we are of the view that it is not necessary to conclude on options available to Ofwat for mitigating or

[116] However, Pennon does not specify which counter-intuitive or insignificant variables should be removed.

offsetting a reduction in precision. We have therefore not considered this issue further.

6.120 Our conclusions on the precision effect are set out alongside our overall conclusions on impacts on wholesale price controls in paragraphs 6.168 to 6.174.

How a merger might result in adverse impacts: benchmarking effect

6.121 Aside from the loss of precision in Ofwat's models, a merger might also lead to the loss of a comparator which is particularly valuable in setting the efficiency benchmark for the industry. Ofwat uses such water companies that perform particularly well to challenge others to perform better. In the context of wholesale cost modelling, the impact of loss of a comparator can be proxied by considering whether a merger might change the efficiency benchmark and as such may lead to other water companies in the industry receiving a less (or more) demanding determination, relative to the counterfactual case in which SWW and BW do not merge. The effect of the merger on the wholesale efficiency benchmark will depend on the expected performance of the merged entity compared with the expected performance of the parties absent the merger. In PR14 Ofwat set the efficiency challenge at the UQ, and, as noted in paragraph 6.45, Ofwat has indicated that it intends to use a UQ in PR19. Therefore, we have assessed how a merger might affect a UQ benchmark. In general, we would expect that:

- if the two merging parties are both more efficient than the UQ threshold in the counterfactual case, the merger will lead to a decrease in efficiency as one water company above the quartile is removed, so the quartile shifts down to the next water company;

- if the two merging parties are both less efficient than the UQ threshold, the merger will lead to an increase in efficiency as one water company below the quartile is removed, so the quartile shifts up;

- if the merger parties lie either side of the UQ, the impact of the merger will depend on which quartile the merged entity is expected to fall into. This will depend on the efficiency of the merged company, relative to the best-performing of the two merger parties.

6.122 In line with past CC water merger cases, we have used both a static and a forward-looking approach in considering the possible impact on Ofwat's wholesale efficiency benchmarks.[117]

6.123 The static approach involves simulating the outcome of the wholesale cost modelling at PR14, but on the assumption that BW and SWW have merged.

6.124 The forward-looking approach involves simulating the possible future impact of the merger. In doing so, we have to make assumptions about the probabilities of water companies' performance rankings in the future (since we do not expect water companies' relative efficiency ranking to remain fixed over time). There are several different approaches that can be taken to estimating the probabilities of water companies' future rankings, as discussed below and in Appendix E.

6.125 The static approach does not attempt to control for future changes in costs, efficiency rankings or regulatory approach. In general, we would expect to put less weight on the results of the static analysis compared with a forward-looking approach which attempts to control for the probabilities of future changes. However, we consider that it is useful to set out the static results first to provide a cross-check against which to consider more forward-looking modelling results.

Pennon's submissions on the benchmark effect

6.126 Pennon submitted that the merger would not result in a less stringent benchmark being set in PR19. Its key arguments in this regard are summarised below whilst specific points that it presented to us on modelling approaches and assumptions are set out in Appendix E.

6.127 Pennon's main argument was that the results of the PR14 wholesale benchmarking exercise – where BW was ranked first and SWW second in Ofwat's efficiency ranking – did not provide a good indication of how the parties would be ranked in PR19. Pennon said that a static approach to the quantitative analysis would overstate BW's importance in setting a performance benchmark for the rest of the industry and that looking forward the evidence indicated that BW was likely to fall in the comparative totex rankings in the years to come, had it remained independent. Indeed, Pennon submitted that under Ofwat's PR14 assessment, based on business plan projections, BW would be ranked [✂] in 2019 and as such it would not be in the UQ for that

[117] CC (31 May 2012), *South Staffordshire plc/Cambridge Water plc merger inquiry*; CC (1 May 2007), *South East Water Limited and Mid Kent Water Limited*.

price review.[118] Pennon said that in PR14 Ofwat placed considerable weight on business plans in its assessment of wholesale cost efficiency and deciding on whether a company met the standard for 'enhanced' status (paragraph 3.13) and therefore the CMA likewise could place weight on business plans in considering future efficiency rankings.

6.128 Because of this, Pennon submitted that the static approach analysis should not be given any weight in the CMA's decision (even as a sensitivity analysis).

6.129 Pennon further submitted that using the historical rankings for BW, on which ranking changes probabilities were applied, were not an informative guide on the future rankings of water companies.

6.130 In terms of the forward-looking approach, Pennon submitted that the totex efficiency ranking from PR14 overstated BW's actual efficiency. Pennon told us that there were several reasons for this.

6.131 First, BW did not believe it was able to meet its UQ efficiency target going forward. Pennon submitted that this was illustrated by BW selecting an option from the PR14 cost menu that was below the UQ and was internally targeting this level of expenditure.

6.132 [✂]

6.133 Third, Pennon submitted that BW's totex efficiency ranking at PR14 was distorted by a particular element within its wholesale cost modelling – the supply-demand balance model – which suggested an implausibly high level of efficiency for BW. The supply-demand balance model is a unit cost enhancement model (see Appendix B, Figure 1), which models any additional expenditure water companies need to make to be able to balance supply and demand.[119] For instance, if a company has significant seasonal fluctuations in demand, driven by an influx of tourists, it may have to spend more money to be able to meet this demand than another company with a more stable demand profile. Pennon submitted that the supply-demand balance model predicted £[✂] of expenditure over the historical period, which compared to its actual spending of around £[✂] over the same period. Moreover, the EA has now classified BW as not water stressed. As such, BW's has no forecast activity in this area. Thus, if Ofwat's cost assessment exercise is repeated for

[118] The UQ level lies between the fifth- and sixth-ranked water companies.
[119] The supply-demand balance model is one of four models which determine the totex 'bottom up' result, which itself is one of three modelling results which are 'triangulated' by Ofwat to arrive at an estimated totex basic cost result (before special adjustments are taken into account by Ofwat).

PR19, BW will not be included in the model so cannot receive an over prediction.

6.134 Pennon also submitted that it expected the merger to result in a number of synergies and efficiency savings. These, or at least a proportion of these (Pennon suggested 25% would be a conservative assumption), should be taken into account by the CMA. We note that not all of the purported efficiencies submitted by Pennon relate to wholesale activities.

Ofwat's submissions on the benchmark effect

6.135 Ofwat submitted that the merger might result in prejudice to its ability to compare water companies for the purpose of setting wholesale price controls.

6.136 It told us that both BW and SWW were within the UQ of water companies at PR14, indeed they were the two highest ranking water companies.

6.137 Ofwat submitted that in determining an analytical approach for a forward-looking assessment, greatest weight should be applied to historical cost performance as it was derived from out-turn data. Ofwat said that using business plan forecasts instead of historical performance to predict future rankings in a forward-looking analysis might give misleading results. It submitted evidence on the difference between business plan forecasts from the time of PR09 and actual out-turn data on costs, and the subsequent change in efficiency cost rankings between the two forecasts.[120] The results were that almost all the water companies changed their ranking to some extent, with five water companies changing their ranking by five places or more (either improving or worsening), indicating that they moved between quartiles. Further, Ofwat said that business plan rankings did not allow for cost items that were not allowed in the final determination in PR14 and, in any case, the fundamental tenet of menu regulation was that water companies were incentivised to beat their own business plan forecasts. Therefore, assuming that business plans represented the true efficiency over the next five years was not in line with company behaviour. Ofwat submitted that a forward-looking analysis based on historical performance showed that the loss of BW as an independent comparator was likely to adversely affect Ofwat's assessment of the wholesale cost benchmark.

6.138 Under the static approach analysis, Ofwat submitted that in PR14 the UQ efficiency threshold was set at 93.47% (meaning that a hypothetical company at exactly the UQ level – ie the 5.25th ranked company – would have actual

[120] Based on business plan forecasts for 2010–2015 and actual expenditure for the period 2010/11 to 2013/14.

wholesale costs equating to 93.47% of its modelled costs). By combining SWW and BW the merger would make the UQ threshold less demanding by moving it up by 0.6 percentage points. Ofwat estimated that this could translate into an overall customer detriment of £112 million (over five years).

6.139 Under the forward-looking approach Ofwat submitted that using historical rankings to determine probabilities of future changes in efficiency rankings for each water company was a more robust way of assessing future performance than using company business plans. How these probabilities are determined and applied is discussed in Appendix E.

6.140 In its analysis Ofwat did not assume any convergence in performance between water companies (so the gap between, say, the fifth and the sixth ranked companies in PR19 would be the same as it was in PR14).

6.141 Ofwat submitted that under the forward-looking approach the merger would result in a less stringent benchmark for the industry and the associated customer detriment would be up to around £30 million over five years.

CMA's analytical approach to the benchmark effect

6.142 The details of our analytical approach are in Appendix E.

6.143 We note that the key driver for the results of both the static and the forward-looking analyses is the choice of starting ranking.[121] We consider that the decision on the appropriate starting ranking for the merger parties will depend on how well historical out-turn rankings or business plan rankings (or any other approach) can be expected to reflect past and future performance of the merging water companies. We have considered:

(a) First, whether there might be specific reasons why the historic out-turn rankings at PR14 for BW and SWW might not be a good reflection of the current and future performance of the parties.

(b) Second, and linked to the first, whether we should base the PR19 ranking that is the starting point for the forward-looking analysis on historical data or business plan forecasts.

6.144 When assessing whether the PR14 out-turn rankings were a good reflection of past performance, we have considered two issues.

[121] Since if a company is highly ranked in PR14 the methodologies we use for predicting future rankings will assign it a higher probability of being highly ranked in the future than a poorly ranked company in PR14.

6.145 First, we have analysed the historical performance of each of the merging parties over the period 2000–2009 and compared this to the performance at PR14. We found that both SWW and BW had a lower ranking over this period, with BW having an average composite[122] ranking of 12th. Whilst we accept Ofwat's argument that the change to totex in PR14 would have driven a change in rankings, the step change in BW's ranking raises questions over whether the PR14 ranking accurately reflects historical performance.

6.146 Second, we have considered Pennon's arguments that BW's ranking is artificially inflated by the supply-demand balance model. We note that during the course of PR14 water companies would have had the incentive to challenge models which predicted low levels of expenditure, but not those which predict high levels of expenditure. Since BW is a small company there is greater scope for a single model to skew its efficiency ranking.[123] In this case Pennon submitted that the supply-demand balance model predicted expenditure around ten times in excess of historical spending. Further, Pennon submitted that future spending on getting additional water would be zero, as BW was no longer classified as 'water stressed'.[124] As a result, in future BW would not be included in the supply-demand balance model absent the merger which would worsen its efficiency score by dint of not having the denominator of that score (estimated expenditure) inflated by a predicted spend greater than actual spend.[125] Pennon calculated that accounting for the over prediction of expenditure in the supply-demand balance model, would result in BW having a ranking of sixth or eighth (depending on the methodology used), both of which are below the UQ threshold.

6.147 Ofwat did not dispute Pennon's findings on the supply-demand balance model but told us that it was only one of several feeder models into Ofwat's overall econometric benchmarking calculations. Further, Ofwat told us that BW had been efficient in bridging the gap between the demand for and its ability to supply water, which was why it performed well in that particular model in PR14. In the circumstances of this inquiry, we consider it is appropriate to take account of the effect of the supply-demand balance model on BW's efficiency ranking.

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[122] The composite ranking combines opex and capex rankings. See Appendix E.
[123] By way of an example, enhancing supply through an investment of a certain monetary value would affect a small water company proportionally more than a large water company.
[124] Environment Agency (July 2013), *Water stressed areas – final classification*.
[125] The efficiency score is the ratio of actual expenditure to estimated expenditure (paragraph 6.29). In calculating the ratio the estimated expenditure is the denominator. Therefore, if the models' estimation of a water company's cost is unduly inflated for whatever reason, that water company will be awarded a low efficiency score which will lead to a higher efficiency ranking. The extent to which the denominator will be inflated will ultimately depend on the triangulation process of the various models.

6.148 We went on to consider the appropriate starting ranking for the forward-looking analysis for PR19. In particular, we have assessed which of the three options (below) is likely to give a better or worse prediction of future rankings:

(a) Using the PR14 historical out-turn to forecast the PR19 ranking.

(b) Using the PR14 out-turn, controlling for the supply-demand balance model, to forecast the PR19 ranking.

(c) Using the business plan rankings to forecast PR19 efficiency rankings.

6.149 Historical rankings will be particularly relevant in mergers where we believe they are reflective of current and historical performance. However, in this case we consider that the PR14 ranking has overstated the efficiency of BW, due to the effect of the supply-demand balance model. Therefore, although we have also used PR14 out-turn rankings as the starting point for the forward-looking analysis and we forecast these through to PR19 to give the forward-looking starting ranking, we place less weight on these results.

6.150 We have considered whether we should use the historical out-turn rankings, controlling for the effect of the supply-demand balance model. Although, we consider it is necessary to account for the effect of this model on BW's ranking, we have not found it necessary to produce a separate estimate of the forward looking impact on this basis. This is for two principal reasons. First, the business plan ranking for BW is directionally the same as the historical ranking if the effect of the supply-demand balance model is excluded, with BW ranked sixth or eighth on historical rankings, or ninth on business plan rankings, all of which are outside of the UQ. Hence if we use business plan rankings the results will be similar to accounting for the effect of the supply-demand balance model. Second, whilst the evidence on the supply-demand balance model indicates that BW would not be ranked in the UQ absent the merger, there are nevertheless different methodologies available for controlling for this effect and each may result in different rankings (and as such would lead to a number of different forecast impacts).

6.151 We note that business plans were given a prominent role in PR14 (predominately regarding wholesale price controls but Ofwat also used business plans as a part of its assessment regarding household retail price controls) and Ofwat designed incentives to ensure that those plans reflected the water companies' best estimates of costs. We note that the large majority of the final business plans were within 5 to 10% of Ofwat's totex forecast, which suggests that for the majority of water companies, including the two merging parties, the business plan estimates may be a reasonable reflection of costs. Moreover, it is important to note that although there may be

differences between the business plan forecast and out-turn for the PR09 control period, there are good reasons to think that these may be greater than will occur for PR14. Furthermore, we consider that in this case there is little difference in the results between using business plan rankings or historical rankings controlling for the supply-demand balance model. Further discussion of the appropriateness of using business plans is in Appendix E.

6.152 Finally, since business plans, like other tools, will not be definitive predictors of the water company's performance and rankings in PR19, we have used the probabilities matrix to place a confidence interval around these estimates. We have done this by assuming that the business plan rankings which are forecast for PR19 were in fact the rankings in place at PR14 and then we have applied the changes probabilities to those rankings. This approach gives a range of probabilities for the PR19 outcome and as such accounts for uncertainty in the business plan forecasts. Because this approach uses business plan forecasts, which we consider as the best available approach for predicting future efficiency levels in this case, adjusted by a probabilities matrix regarding future ranking changes being applied to it, it therefore forms our baseline estimate in this case.

6.153 The probabilities matrix of ranking change is based on the frequency of observed historical changes in ranking across all water companies in England and Wales. This matrix takes the starting ranking for the forward-looking analysis and forecasts the potential future rankings of each of the merging parties at each future price control up to PR39. Further details of the probabilities matrix is in Appendix E.

6.154 Regarding efficiencies arising from merger synergies, Pennon submitted that cost efficiencies totalling around £[✂] per year would be realised as part of the merger, although we note that only a proportion of these efficiencies will relate to wholesale costs.[126]

6.155 We consider that in principle there is an argument for including merger efficiencies in estimating the impact of the merger on wholesale benchmarks, provided they are timely, likely and merger-specific. In principle, efficiencies resulting from a merger could directly reduce the costs of the merged water company. This may affect the merged water company's forecast efficiency

[126] Efficiencies submitted by Pennon excluding the sale of land and properties.

score ranking, and in turn could increase the likelihood of the merged water company forming part of the UQ benchmark.[127]

6.156 In order to accept these efficiencies and include them in our modelling calculations, we would have to be content, based on compelling evidence,[128] that the efficiencies were timely, likely to occur and could not be realised absent the merger.

6.157 Our approach is to conduct an assessment of efficiencies only *after* a baseline assessment of whether the merger is likely to result in prejudice to Ofwat's ability to make comparisons without taking efficiencies into account. We would take efficiencies into account where we have found that the merger is likely to result in prejudice and only if we are of the view that the consideration of efficiencies is likely to lead to a different finding. We have not found it necessary to conduct an assessment of efficiencies in view of our conclusions in this inquiry.

CMA analysis of the benchmark effect

Static analysis

6.158 Based on the assumption that BW and SWW are ranked one and two respectively (as they were at PR14), we would expect that the merger would lead to the loss of a high-performing comparator under the static approach, and would shift the benchmark downwards, as illustrated in Table 1.

[127] We note that some merger synergies may form 'relevant customer benefits' for the purposes of considering remedies – see sections 30 and 35 of the Act (as amended by the Water Mergers (Modification of Enactments) Regulations 2004) and CC9 paragraphs 3.33–3.36.
[128] By analogy with standard mergers, as per the *Merger Assessment Guidelines*, paragraph 5.7.4.

Table 1: Static approach movement in rankings

Rank	Identifier	Efficiency ratio (%)		Rank	Identifier	Efficiency ratio (%)
1	BW	84.3		1	SWW/BW	84.4
2	SWW	84.5				
3	PRT	91.5	UQ	2	PRT	91.5
4	SEW	92.6		3	SEW	92.6
5	NES	93.3		4	NES	93.3
6	SSC	94.1		5	SSC	94.1
7	TMS	94.3		6	TMS	94.3
8	SVT	95.7		7	SVT	95.7
9	DVW	95.9		8	DVW	95.9
10	YKY	96.1		9	YKY	96.1
11	AFW	97.2		10	AFW	97.2
12	ANH	99.4		11	ANH	99.4
13	WSX	100.6		12	WSX	100.6
14	SRN	101.7		13	SRN	101.7
15	UU	102.9		14	UU	102.9
16	SES	103.5		15	SES	103.5
17	WSH	109.7		16	WSH	109.7
18	BRL	122.4		17	BRL	122.4
UQ threshold		93.5		UQ threshold		94.1

Source: Ofwat.

6.159 We found that the merger results in a 0.654 percentage point worsening in the industry UQ efficiency target, relative to the pre-merger level.[129]

6.160 Rerunning the static approach based on the PR14 totex efficiency rankings controlling for the supply-demand balance model (with SWW ranked first and BW ranked sixth or eighth) we found that the merger would result in a more demanding UQ efficiency benchmark, because it would remove a below UQ comparator and increase the UQ efficiency threshold by 0.2 percentage points.[130]

Forward-looking analysis

6.161 In order to simulate the possible future impact of the merger on Ofwat's wholesale cost benchmarks, we have followed the approach used in past CC cases and by Ofwat and Pennon in their submissions to us. This involves estimating the probability of future changes in water companies' relative efficiency performance based on the evidence of past ranking movements. Simulating the probability of future ranking changes allows us to estimate the likelihood of the merged entity being above or below the UQ efficiency level in future, and hence to predict the expected impact of the merger in future years.

[129] This impact on the benchmark can be translated into a measure of customer detriment multiplying it by the industry totex over the PR14 period (£17,353 million) to give an estimated detriment to customers of £112 million over the five years of the PR14 period. This estimate is based on the predicted change in the basic cost threshold. We have not attempted to apply any caps or menu weightings to reflect the way in which Ofwat might determine cost allowances for individual water companies. This assumption is discussed in more detail in Appendix E.

[130] To translate that change in the benchmark to an effect on customers we estimate that the benefit would be around £37 million (in present value terms) over five years.

6.162 For our core modelling results we have used a 'changes matrix' approach, based on historical ranking movements over five-year periods. This approach was also used by Ofwat in its submissions to us. Pennon suggested that we also use an alternative approach based on two- and three-year changes in ranking. We chose not to pursue this approach because of concerns about the robustness of the predicted probabilities, given the fairly limited amount of data on which to base the calculations. More detail on the different probability matrices is set out in Appendix E.

6.163 The above approach does not allow us to estimate changes in the UQ threshold itself, but rather the probabilities of ranking shifts including between quartiles. We have been able to estimate the effect on customers under the three different forecasting assumptions that we have used, and these results are presented in table 2.

Table 2: Forward-looking effect on customers based on different starting points

Starting point	*NPV impact over 25 years (£m)*
Scenario 1:Business plan rankings	61
Scenario 2: Business plan rankings with changes matrix	–9
Scenario 3: Historical rankings with changes matrix	–63*

Source: CMA calculations.
*This estimate differs from Ofwat's due to difference between the changes matrix they propose and the one we use. These are set out in the appendix.
Note: NPV (net present value) is based on a discount rate of 3.5%.

6.164 Of the three assumption scenarios above, we are of the view that the business plan rankings with a changes matrix applied (scenario 2) is likely to provide a better indication of rankings at the time of PR19 than historical rankings (paragraphs 6.143 to 6.152) Under this scenario the analysis shows that the merger results in an adverse impact on setting UQ efficiency targets. We estimate that this adverse impact on the benchmark is equivalent to a customer detriment of around £9 million over 25 years (in NPV terms). We consider this adverse impact to be small.

6.165 Scenario 1, which uses the business plan rankings at PR19 as starting rankings results in no adverse impact. We apply some weight to this result and note that the true impact is likely to lie between scenarios 1 and 2.

6.166 Scenario 3, which uses the rankings from PR14 as starting rankings and applies changes probabilities, results in an adverse impact to Ofwat's ability to set a stringent UQ threshold,. However, the balance of evidence available to us indicates that this result is based on a higher probability that BW will be in the UQ of water companies in PR19 than we consider to be likely, in particular

given the evidence provided on the cause of BW's high position within the PR14 rankings (paragraphs 6.146 to 6.152). Consequently, we give no weight to this result.

Conclusion on wholesale price controls

6.167 A merger could impact on Ofwat's ability to set wholesale price controls in two ways. First, the econometric models could lose a degree of precision so that they are less able to predict industry efficiency and comparisons between water companies are less effective as a result. Second, the efficiency benchmark itself could be set at a less stringent level than it would have been without the merger (leaving customers worse off). We have examined the merger's impact on setting wholesale price controls on both aspects.

Precision

6.168 With respect to precision, we have looked at four main methods to estimate the statistical loss in precision:

- the General Approach (paragraphs 6.57 to 6.81);
- the Specific Approach (paragraphs 6.82 to 6.96);
- bootstrapping (paragraphs 6.97 to 6.102); and
- Qualitative Approach (paragraphs 6.103 to 6.112).

6.169 Both Pennon and Ofwat submitted modelling results using a General Approach to us on the precision effect. Pennon submitted that on average post-merger the total cost difference with respect to the average cost line would become less precise in two specifications of two unit cost models (ranging from 2.9% to 8.4%) and more precise in one specification of one unit cost model (of 20%), such that the average change in precision under its interpretation measures a small improvement in precision. Ofwat estimated that the merger would lead to a reduction in precision, as measured by a 7.5% increase in the error band around the overall totex estimate and a 4.7% reduction in the precision of the UQ benchmark.

6.170 We also undertook our own analysis under the General Approach. We found that the merger is likely to lead to a reduction in statistical precision. Although there are analytical difficulties in quantifying the effect, we consider that an estimate of a 4% diminution in precision appears, based on our own analysis, to be the most reasonable available to us (paragraph 6.80). This estimate is calculated from a 0.18 percentage point reduction in precision from 4.9% to 5.08% around Ofwat's econometric totex estimate. We recognise that our

modelling too has limitations including that it does not provide an estimate of the reduction in precision of the UQ benchmark.[131] Therefore, we consider that under the General Approach the merger has an adverse impact on the precision of Ofwat's econometric wholesale benchmarking models. The level of imprecision estimated according to our General Approach is around £6.3 million less precise in total in any given year equating to £350,000 for the average water company in Ofwat's overall econometric totex estimate. The increased uncertainty around the cost estimate could lead to predicted costs being either higher or lower following the merger, so this measure should not be interpreted as a direct estimate of consumer detriment from loss of precision. We consider that such a decrease in precision is unlikely to limit Ofwat's ability to contest any requests from water companies for an adjustment to their cost allowance. We did not consider this adverse impact to be significant in the particular circumstances of this inquiry.

6.171 Further, when we examined BW's characteristics under the Qualitative Approach, the evidence indicated that although the merger will lead to some loss in variation in Ofwat's data in four variables, any resulting loss in precision is likely to be small.

6.172 We have noted what Ofwat has told us that irrespective of the outcome of this merger inquiry it will continue to use a UQ threshold in its wholesale efficiency benchmarks. There is no indication that Ofwat would have chosen to set a more stringent benchmark in PR19, absent the merger. But in the event that Ofwat did want to set a more stringent benchmark in the future, it told us that the decision would be based on a range of factors, of which precision of its models was only one.

6.173 In our decision we have not placed weight on results of the Specific Approach because of the econometric limitations discussed above (paragraphs 6.88 to 6.92 and 6.95 to 6.96). Likewise, because of the technical econometric concerns that we have about bootstrapping we have not relied on these results (paragraph 6.101).

6.174 We therefore found that the merger is likely to lead to some reduction in precision but this is unlikely to affect either Ofwat's ability to set cost-stretching benchmarks or its susceptibility to water companies' requests to adjust their cost allowance for specific cost factors. Although we consider that the merger is likely to result in some adverse impact, we did not consider this adverse impact to be significant.

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[131] We note that our estimate might be overstated for the statistical reasons given in Appendix D, paragraph 45(b) to (d).

Benchmarking

6.175 Our analyses of the benchmarking effect show that the results are sensitive to the starting rankings of SWW and BW in the analysis. Therefore, a key question for us has been on which method of forecasting future rankings should form the basis of our analysis. We considered three possibilities: (i) rankings based on business plan forecasts, (ii) historical ranking changes or (iii) business plan forecasts with changes probabilities applied to it. Of these our preferred approach is to use business plan forecasts with a changes matrix applied to it for the reasons in paragraph 6.152. Under this we found that the merger is likely to have an adverse impact on the UQ benchmark. We estimate that the adverse impact on the benchmark is equivalent to a customer detriment of around £9 million over 25 years (in NPV terms).We considered this adverse impact to be small (see paragraph 6.164).

6.176 We have also applied some weight to the business plan method. It showed no adverse impact resulting from the merger (paragraph 6.165).

6.177 We consider that neither of the above methods reveals the true impact of the merger, which is likely to lie somewhere between the two. That is, an impact that is either not adverse or adverse but small (paragraph 6.165).

6.178 We therefore concluded that the merger is likely to lead to no adverse impact or a small adverse impact with respect to the wholesale benchmark effect. In light of this, we did not find it necessary to conduct an assessment of efficiencies in this inquiry (see paragraphs6.155 to 6.157).

6.179 Considering the precision and benchmarking effects together we therefore concluded that the merger is likely to result in some adverse impact on the setting of wholesale price controls but we do not think that the adverse impact is significant.

Retail price controls

How Ofwat uses comparators in retail price controls

Non-household retail price controls

6.180 We have not found it necessary to conduct an in-depth assessment on the impact on setting non-household price controls. This is because the introduction of competition in the non-household retail sector in 2017 brings with it uncertainty over who will be participating in this activity at the time of the next price review and uncertainty about whether Ofwat will conduct comparative benchmarking. In PR14 Ofwat set price controls in this area for a

period of two years, which further highlights the uncertainty surrounding future regulation in the area.[132]

Household retail price controls

6.181 For household retail price controls in PR14 Ofwat has used an ACTS threshold to set retail price controls for both metered and separately non-metered households. The ACTS was based on benchmarking analysis across all the water companies (although there was a single revenue control determined for each company). Ofwat used metered and unmetered customers separately in its calculations.

6.182 Ofwat told us that it was unlikely to use an ACTS measure in PR19 but will rather replace it with an efficient CTS target (for example, a UQ or at the frontier). However, the importance of comparisons remains irrespective of where Ofwat chooses to set the benchmark.

How a merger might result in adverse impacts

6.183 The ACTS is calculated as a simple average of the CTS per customer of each individual company, and as such is not weighted to take account of the size of the company. In contrast, by merging, two water companies that previously separately reported their CTS will now report a single CTS for the merged entity, which is equivalent to a weighted average of their individual pre-merger CTS.

6.184 By way of illustration: if the ACTS is based on two water companies, A and B, with water company A having 90 customers and a CTS of £30 per customer and water company B with ten customers and a CTS of £20 per customer and these two water companies were to merge, the pre-merger ACTS would be £25 per customer,[133] whilst the post-merger CTS for the merged entity (which is now the industry ACTS) would be £29 per customer.[134]

6.185 Therefore, a merger is able to change the industry ACTS – or any alternate measure that Ofwat may use such as an efficient CTS measure (see paragraph 6.195) using a UQ or frontier company – and as such lead to a different benchmark being set. If the merger removes data points from below Ofwat's chosen threshold (whether that is a simple average or UQ) – that is, a 'bad' comparator is removed – that threshold will become more demanding as

[132] Ofwat has stated that it will undertake a sector-wide review of non-household price controls in 2016 (Ofwat (July 2015), *Towards Water 2020 – policy issues: regulating monopolies*).
[133] Since it is the simple average of the pre-merger individual CTS it is 20+30 / 2.
[134] This is calculated as £30 multiplied by 0.9 plus £20 multiplied by 0.1.

a matter of arithmetic. Conversely, a merger that removes a 'good' comparator will see the threshold shift to a less challenging position.

Pennon's submissions on retail price controls

6.186 Pennon told us that the merger would result in a benefit to the industry at large and that this would be the result irrespective of which of the analytical method options the CMA chose to assess its impact on retail price controls.

6.187 Pennon submitted that its analysis, under the static approach, showed a benefit resulting from the merger, predominantly driven by a reduction in the doubtful debt adjustments.[135] Pennon submitted that this was because combining BW's customer base with SWW's customer base would reduce the overall proportion of deprivation in the combined areas (compared with SWW's area on its own). This benefit comprised £18 million over five years for unmetered customers and for metered customers Pennon estimated that the merger would result in a detriment of around £1 million over five years, thereby resulting in an overall benefit to customers of £17 million over five years.

6.188 Pennon also submitted that without the doubtful debt adjustments the merger would result in an overall benefit, although that net benefit reduced to £5 million over five years (comprising a benefit of £7 million to unmetered customers and a detriment of £2 million to metered customers).

6.189 Under a forward-looking approach Pennon has assumed that 75% of the CTS gap between the frontier company and the rest of the industry is closed within 20 years (for serving both metered and unmetered customers). It submitted that this was based on the Ofwat PR14 impact assessment. Pennon has also assumed that in PR19 Ofwat will use a UQ threshold for household retail price controls (Ofwat has indicated that it might do this).

6.190 Under these assumptions Pennon submitted that the merger would result in an overall benefit of £21 million over 25 years, made up of a benefit of £38 million for unmetered customers (where the merger removed a non-UQ company) and a detriment of £17 million for metered customers (where the merger removed a UQ company, SWW).[136]

[135] In PR14 SWW received an adjustment on its CTS regarding unmetered customers.
[136] Pennon submitted that the overall position of £21 million was not simply the sum of £38 million and £17 million since the convergence assumptions for metered and unmetered customers were applied separately to the combined costs of SWW and BW.

Ofwat's submissions on retail price controls

6.191 Ofwat submitted that under the static approach the merger would lead to an overall customer benefit of £21 million over five years. This effect was largely due to the mergers effect on bad debt adjustments, which principally affected Northumbrian Water, United Utilities, SWW and Welsh Water. Excluding any bad debt adjustments, Ofwat estimated an overall benefit of £5 million as a result of the projected reduction in average CTS.

6.192 In assessing the merger under the forward-looking approach, Ofwat applied a changes matrix based on historical opex data.[137] Ofwat also made a number of other assumptions. On convergence of CTS across water companies, Ofwat assumed, for one calculation, that all water companies outside of the UQ would converge to the UQ level by 2025 and, for a separate calculation, no convergence.[138,139] Ofwat applied its calculations to both a UQ threshold and a frontier company threshold. Ofwat has also submitted an alternative to Pennon's 75% convergence rate, which was a rate of convergence starting in 2015 and 75% of the CTS gap between the frontier company and the rest of the industry being closed by 2035.

6.193 Overall, Ofwat estimated that the merger would result in a benefit to customers under the UQ assumption calculation of around £1–£6 million, and if Ofwat were to move to an efficiency frontier approach for retail price-setting in the future, Ofwat found that the merger was unlikely to have an impact on the benchmark.

CMA's analytical approach to retail price controls

6.194 We have been mindful in our approach that Ofwat is likely to change some of its approach to setting retail price controls going forward. It has indicated that it will move from an ACTS approach to an 'efficient cost to serve' approach in future reviews, perhaps with a UQ threshold or a frontier company for household price controls.

6.195 Given that Ofwat has indicated that it would not follow the same bench-marking approach for household retail as it did in PR14, we have not found it necessary to undertake a static analysis for this regulatory activity. In

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[137] Since Ofwat did not previously set a retail price control, it submitted that it was appropriate to look at changes in opex as retail spending would have fallen within this category.
[138] Rates of convergence in performance matter since the impact of a loss of a good comparator will be lessened if other water companies are expected to reach that level of performance in any case.
[139] Ofwat submitted that it was appropriate to assume some degree of convergence in retail as retail price controls were adopted for the first time in PR14. As such it expected there to be increased management focus resulting in poorer-performing companies catching up to the benchmark.

particular Ofwat told us that at PR19 it expected to set the threshold at an efficient CTS threshold (which could be, for example, UQ or at the frontier).[140] Instead, we have focused on the forward-looking approach where we can adapt our analysis to test different future scenarios.

6.196 In order to model the impact of the merger we must make certain assumptions as to how the merged entity would have performed in the past and as to how it will perform in the future. By making such assumptions, SWW and BW can be substituted for the new merged entity, which will allow us to simulate whether the merger would have had an impact either on the most recent price review, or a future one.

6.197 Both Ofwat and Pennon have taken the weighted average[141] of the two parties' historical retail CTS as the combined entity's CTS. We agree with this approach.

6.198 On the issue of convergence of CTS across water companies, Ofwat believed that PR14 provided both Ofwat and water companies with better information and knowledge of the differences between water companies as a result of better accounting separation data. Further, it believed that having a separate retail control would allow the management of each company to focus on outperforming the PR14 retail price controls. Ofwat has assumed that water companies whose CTS is higher than the UQ would converge to the UQ by 2025. Pennon, on the other hand, has assumed that convergence would take place at a slower rate – ie 75% of the gap between the frontier company and the rest of the industry was closed within 20 years.

6.199 We note that the magnitude of the results of the forward-looking approach are likely to be sensitive to the assumed level of industry convergence, and that the assumed level of convergence may also affect the time horizon over which the impact of the merger is assessed. For instance, the faster we expect water companies to converge to the same CTS, the shorter the time period over which the merger could have an effect.[142] Moreover, Ofwat considered that it was likely to be able to use non-water-based comparisons beyond 2025. This would mean that future regulation would be at least not exclusively based on efficiency comparisons between water companies, and thus that no impact of the merger should be assessed after 2025. However,

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[140] See also Ofwat's policy document, *Towards Water 2020 – policy issues: regulating monopolies* (July 2015), which highlights a range of options for setting household retail benchmarks in 2019 including whether Ofwat should move to more demanding UQ or frontier efficiency targets and whether benchmarks should be dynamic, reflecting the expected future rate of change, rather than the level of efficiency at the time of the final determination.
[141] Weighted by number of customers.
[142] Since once companies all have the same CTS, there can be no change in the benchmark due to a merger.

the key result, whether the merger results in an adverse impact, is not sensitive to convergence assumptions.

6.200 Given the range of plausible views on possible rates of convergence and that there is no clear evidence on the topic,[143] we have analysed three scenarios:

- Convergence starts in 2020/21 and water companies whose CTS is higher than the UQ converge to the UQ by 2025.
- Convergence starts in 2020/21 and 75% of the gap between the frontier company and the rest of the industry is closed within 20 years.
- Convergence starts in 2015/16 and 75% of the gap between the frontier company and the rest of the industry is closed by 2034/35.

6.201 In each scenario we have only monetised the impact until 2025.

6.202 We have not applied a frontier shift in our analysis, so the performance of the best water company stays fixed over the course of our analysis.

6.203 We also considered whether the merger might affect the precision of Ofwat's retail benchmark. Following the merger, the threshold would be based on a CTS measure across 17 rather than 18 water companies, and as a result we would expect the variance around the threshold to increase. However, we consider that this impact is likely to be small as we have found no reasons to consider that the remaining 17 water company comparators would not be sufficient for Ofwat. Therefore we consider that the reduction in precision effect is mainly characterised by how much more susceptible 17 data points are to random error compared with18 data points. We consider that this impact does not have a material effect on the precision of a CTS threshold.[144]

CMA analysis of retail price controls

Forward-looking analysis

6.204 In PR14, to serve metered household customers SWW was ranked third and BW 11th, and for unmetered customers BW was ranked 12th and SWW 15th.

6.205 We are mindful that after the merger Ofwat would have 17 independent water company comparators with which to determine a benchmark. The way in which Ofwat will use benchmarking in setting household retail price controls

[143] As Ofwat set separate price controls for household and non-household retail customers, set efficiency targets for the retail household sector and directly incentivised performance for the first time in PR14.
[144] We also consider that similar reasoning will apply to our analysis of ODIs.

(whether through the ACTS or a UQ threshold) means that there will not be a material reduction in precision as a result of the merger since it would still have 17 comparators. Therefore, we have focused on whether the merger would adversely and significantly impact on Ofwat's ability to set an efficient CTS benchmark going forward and, in particular, whether the merger will remove a particularly valuable comparator.

6.206 In estimating the forward-looking impact of the merger, we first apply the convergence scenarios set out in paragraph 6.200. We also need to consider the likely future performance of SWW and BW. In Appendix E we set out the three approaches previously used by the CC to estimate the probability of a change in a water company's ranking. Although we note that all of these methods have limitations, we have used the changes approach to forecast changes in retail rankings. Details of how we have applied changes probabilities to our assessment of retail price-setting are in Appendix E.

6.207 Based on the analytical methods set out in Appendix F we found that the merger is likely to result in a more stringent price control (that will benefit customers).

6.208 We estimate that the magnitude of the benefits to customers will be around £2 million (over five years) under one method or £15 million (over 20 years) under the other method. We note that the £15 million figure is likely to be an upper bound of the impact since it assumes a relatively slow convergence rate. Similarly, we consider the £2 million figure to be a lower bound as it is based on a fast convergence assumption, starting in 2015 and closing 75% of the gap between the frontier company and the rest of the industry in 2035.

Conclusion on retail price controls

6.209 Given that Ofwat has indicated that it would not follow the same bench-marking approach for household retail as it did in PR14, we have not found it necessary to undertake a static analysis. Instead we focused on the forward-looking approach.

6.210 Our analysis concluded that the merger is likely to result in a reduction in the price control for the industry (ie a more stringent price control that will benefit customers) – (paragraph 6.208). We consider that this is a reasonable estimate, as it is based on the assumption that Ofwat will continue to give similar weight to each company in the industry with 17 instead of 18 comparators. Under this assumption, the removal of a non-UQ company will result in a more demanding target.

6.211 We note that there is some uncertainty surrounding how Ofwat will regulate retail activity going forward (paragraphs 6.194 and 6.195) and if Ofwat does move to a dynamic benchmark then the customer benefit figures we have calculated here are likely to be different. But in any case, irrespective of the efficient benchmark level used by Ofwat in the future, our analysis indicates that the merger is unlikely to lead to an adverse impact on setting retail price controls.

6.212 We therefore concluded that the merger is unlikely to result in an adverse impact on Ofwat's ability to set household retail price controls.

Monitoring and incentivising service quality: outcome delivery incentives

How Ofwat uses comparators in monitoring and incentivising service quality through ODIs

6.213 At PR14 water companies were required to propose their own PCs and ODIs. They did so across a wide range of areas, most of which were company-specific although some were common across water companies.[145] Ofwat carried out a comparative analysis on the ODIs and PCs that were most common across the industry. Ofwat told us that it used comparative assessment to identify UQ PCs for three ODIs in regulating the provision of water:

- the duration of supply interruptions;
- the number of contacts from customers regarding water quality; and
- compliance with DWI water quality standards (known as 'mean zonal compliance').

6.214 Ofwat told us that it set rewards for genuinely stretching performance. For some company-specific PCs and ODIs, Ofwat also made use of comparisons where there were similarities in a subset of the water companies. It also used cross-company comparisons to identify gaps in the ODIs proposed by the water companies, and in these areas it intervened to introduce additional ODIs.

How a merger might result in adverse impacts

6.215 A merger will bring two water companies that previously had separate management, under common management. This will lead to two water

[145] Across all companies there were 515 PCs, 312 of these were financial ODIs and 203 non-financial ODIs.

companies that previously reported each of their ODIs separately, reporting the same ODIs on a combined basis, which could have a direct impact on the benchmarks chosen by Ofwat for the common ODIs. To the extent that water companies continue to report separately on their ODIs, the effect of a merger is less clear as it depends on how performance is affected by the move to common management.

6.216 Ofwat has chosen to set UQ benchmarks for 2015–2020 in the common ODIs where the parties overlap (duration of supply interruptions, number of contacts from customers regarding water quality, and compliance with DWI water quality standards). Similarly to the wholesale benchmark, a merger is capable of having an effect on UQ benchmarks relating to these ODIs.

6.217 A merger may affect the outcome of the ODI benchmarking by changing the benchmarks, and as such may lead to water companies in the industry receiving a less demanding determination, relative to the counterfactual case in which the water companies do not merge. The effect of the merger on the ODI benchmarks will depend on the expected performance of the merged entity compared with the expected performance of the parties absent the merger. Absent any improvements in performance, we would expect the following:

- If the two merging parties are both more efficient than the UQ threshold in the counterfactual case, the merger will lead to a decrease in the efficiency benchmark as one water company above the UQ threshold is removed, so the UQ threshold shifts down to the next water company.

- If the two merging parties are both less efficient than the UQ threshold, the merger will not lead to an adverse impact since removing two non-UQ water companies and replacing them with one non-UQ water company means the UQ threshold shifts up.

- If the merger parties lie either side of the UQ threshold, the results of the merger will depend on which quartile the merged entity is expected to fall into. This will depend on the ODI performance and size of each party pre-merger.[146]

6.218 Pennon submitted that it was not appropriate to attempt to quantify the impact of a merger on the ODI benchmarks. It considered that a range of non-quantitative arguments could be used to demonstrate that the merger would not prejudice Ofwat's ability to make comparisons in this area and, as such,

[146] The size of the merger parties will matter to the extent that if one merger party is significantly larger than the other, one would expect the combined entity to be positioned closer to the larger party's position in the rankings.

any quantification designed to assess the magnitude of adverse impacts was not necessary.

6.219 We have therefore first considered whether any quantification is appropriate.

6.220 Pennon has set out why it believes that it is not appropriate to quantify the impact of a merger on the ODI benchmark. The main reason given by Pennon was that ODIs were set on the basis of what improvement local customers were willing to pay for. If a UQ threshold approach (or another threshold set by Ofwat) meant that performance was driven beyond the point of improvement that customers were willing to pay for, then quantification would be misleading in that it would measure that part of the cost of the service improvement which exceeded the benefit gained by its customers from that improvement. It said that the CMA could undertake a qualitative assessment of ODIs instead. Such an assessment could include how the formulation of ODIs through CCGs (and therefore being based on local specific factors) fits in with the framework of benchmarking across the industry, how Ofwat uses benchmarks in the wastewater industry with ten comparators and the relevance of separate reporting by SWW and BW for the remainder of the PR14 period.

6.221 We have considered Pennon's arguments on whether quantification is appropriate carefully. In the circumstances of this inquiry, we are of the view that quantification is appropriate. Ofwat has chosen to set the benchmark at the UQ threshold for the common ODIs. As explained in paragraphs 6.215 to 6.217 the merger could adversely impact on the benchmark and we consider it appropriate to quantify any impact in order to aid our assessment on whether the impact of the merger on Ofwat's ability to make comparisons is, or may be expected to be, adverse and significant enough to amount to prejudice.[147]

6.222 However, we note that quantification of the impact of the merger on the ODI benchmark is one factor in our assessment of whether the merger prejudices Ofwat's ability to make comparisons between water enterprises for the purpose of setting ODI targets. Notwithstanding this, we consider that there is merit in Pennon's arguments and therefore we have treated the quantification estimates as being indicative of the magnitude of the impact on the ODI benchmark rather than a robust measurement of that impact. We have also examined a range of qualitative evidence including the use of separate reporting. Our analysis is discussed below.

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[147] CC9, paragraph 2.3.

Pennon's submissions on ODIs

6.223 Pennon made submissions on the three common ODIs (paragraph 6.213). For drinking water quality (mean zonal compliance) Pennon said that Ofwat set the benchmark at 100% compliance and that no benchmark was required if this level was set again. As such, for mean zonal compliance Ofwat did not set a target in line with the calculated benchmark, so did not utilise comparative benchmarks.

6.224 Pennon said that for interruptions to supply both SWW and BW had set targets for PR14 that were above the UQ benchmark set by Ofwat. SWW had the target of reducing interruptions to 6 minutes per property per year and BW to 4.4 minutes per property per year against the UQ benchmark of 12 minutes per property per year. For PR19 Pennon expected the UQ level to be 9 minutes per property per year.

6.225 Pennon submitted that there were issues affecting comparability with a definition for interruptions to supply common to only 11 companies.[148] Further, the level of rewards and penalties varied greatly between water companies suggesting that different customers in different parts of England and Wales valued different aspects of water supply (or at least wished to see improvements in different areas).

6.226 Likewise, in relation to the number of contacts from customers regarding water quality, Pennon said that only 11 out of 17 water companies had common definitions for this measure and Thames Water had no PC in this at all (despite its size).[149]

6.227 Pennon submitted that with respect to the number of contacts from customers regarding water quality, SWW and BW both had targets above the predicted PR19 UQ level and that the forecast UQ was largely driven by water companies in the south-east of England given that those were hard water areas.

Ofwat's submissions on ODIs

6.228 Ofwat too made submissions to us on the three common ODIs. With respect to mean zonal compliance Ofwat told us that as the performance of all water companies was very similar, the impact of the merger had no effect on the UQ

[148] Pennon's initial submission, paragraph 13.16.
[149] ibid, paragraph 13.17.

performance level. Therefore, no adverse impact would arise as a result of the merger.

6.229 On the number of contacts from customers regarding water quality, Ofwat submitted that BW was ranked fourth (2011/12 to 2013/14 average). Thus Ofwat argued that BW was a valuable comparator, and losing BW from the UQ in PR14 under the static approach would have reduced the benchmark from 1.23 contacts per thousand population to 1.53 contacts per thousand population. Applying company-specific penalties rates to this worsening of the UQ threshold gave an estimated customer detriment of £35 million over three years and applying company-specific reward rates gave an estimated customer detriment of £26 million over three years.

6.230 On duration of water supply interruptions, Ofwat submitted that BW was ranked first (2011/12 to 2013/14 average) and the loss of a UQ comparator would worsen the UQ threshold from 12.3 minutes per property per year to 12.6 minutes per property per year under the static approach. As with the contacts from customers regarding water quality , Ofwat applied company-specific penalty rates to quantify the customer detriment and submitted to us that it was estimated to be around £16 million over three years whilst applying company-specific reward rates gives an estimated customer detriment of around £8 million over three years.

6.231 Ofwat also submitted analysis using a forward-looking approach. To do this, Ofwat made some assumptions about convergence rates on the different ODIs together with some sensitivity analysis (paragraph 6.243). Based on these assumptions Ofwat submitted that the merger would result in a detriment regarding water quality contacts of £8–£45 million (2020 to 2025) and for interruptions to supply of £3–£21 million (2020 to 2025).

CMA's analytical approach to ODIs

6.232 Details of how we have made our examination of the quantification of ODIs are in Appendix G. We have undertaken both a static and a forward-looking approach.

6.233 Our analysis did not find any adverse impact resulting from the merger on mean zonal compliance. Although both water companies were in the UQ in mean zonal compliance at PR14, all water companies achieved very similar average scores between 2011/12 and 2013/14.[150] As a result the merger is

[150] The best-performing company scored 99.980%, the worst performing company 99.931%.

unlikely to lead to any effect on the benchmark[151] and so it is not analysed further.[152]

6.234 ODIs include a range of financial and non-financial incentives to encourage water companies to deliver improved performance against a set target. In the case of financial incentives, since different customers can place a different valuation on services, depending both on their own preferences and existing service levels, the rewards and penalties were developed locally in collaboration with the CCGs. As such the penalty and reward rates differ between water companies.

6.235 Under Ofwat's regulatory framework for ODIs, any gains or losses under financial incentives are realised through adjustments to allowed revenues, and hence prices to customers in PR19. Hence, we can consider the impact of a merger-related change in the ODI benchmark performance level in terms of a monetary impact on customers. For instance, if in response to a change in a benchmark a water company is assumed to reduce its level of service, customers would see a reduction in quality but no reduction in the price they pay for the service. Alternatively, if a water company chooses to maintain its level of service and as such either receives a smaller penalty or a bigger reward, this will change the amount of allowed revenue it can collect from customers in the PR19 period.

6.236 Ofwat has used the company-specific penalty rate to measure the detriment to customers of changes in the UQ. The penalty rates are informed by cost information and willingness to pay data in most cases. However, we note that there is often a difference between the company-specific reward rate and the same company's penalty rate. In most cases Ofwat calculated the penalty rate and reward rate for a company using a simple formula. For the penalty rate this formula took account of information on customers' willingness to pay and company incremental costs; for reward rates only willingness to pay information was used. Ofwat explained to us that penalty rates were intentionally higher than reward rates in most cases. Where this was not the case Ofwat asked water companies to justify why reward rates were higher than penalty rates during PR14. Since both penalty and reward rates include measures of a customer's willingness to pay for a change to a service, there is no obvious reason why one is more appropriate than the other. We consider that we can use either as an indicative measure of the magnitude of customer detriment in the event that customers do not receive a particular improvement in some service (although the actual detriment could lie between the two). Ofwat has

[151] There will only be an effect if the performance of the merged entity was worse than that of both of the merging parties pre-merger.
[152] Ofwat adopted the same approach in its submissions to the CMA.

indicated that it chose to use the penalty rate as it modelled the impact of a reduction in the benchmark, which is directionally the same effect as a decrease in performance that would trigger a penalty.

6.237 We are not primarily concerned with the change in the rewards or penalties that Ofwat levies, but rather the impact of the merger on Ofwat's ability to make comparisons between water companies. We are conscious that after the merger Ofwat would have 17 independent water company comparators (and would have separate reporting from 18 comparators during the PR14 period). Further, the way in which Ofwat uses benchmarking in ODI targets means that there will not be a material effect on precision as a result of the merger.[153]

6.238 One way to measure the impact of the merger is by looking at the value placed on any change in services by customers.[154] This is the customers' willingness to pay (whether reward or penalty). The logic of this is that customers have indicated that they are willing to pay a certain amount in return for improved performance on some aspects of supply, and so if actual improvement falls short of this it gives an indication of how much worse off customers consider themselves to be. Since both penalty and reward rates are based on customers' willingness to pay for an improvement in performance we do not consider that one measure is more appropriate than the other. We have used both the reward and the penalty rates when quantifying impacts. We note, however, that the quantification of the merger's impact using this method should be interpreted as being indicative rather than a reliable prediction.[155]

6.239 In the static approach we have quantified impacts over three years which is the period over which the UQ challenges were set.

6.240 In order to employ a forward-looking analysis we need to consider how well SWW and BW are likely to perform against their peers in the future. Since ODIs were only introduced at PR14, there is insufficient historical data to construct a robust changes matrix (which assigns probabilities of changes in rankings) for each ODI as we have done for other aspects of our analysis.

6.241 However, we are mindful that BW was a good comparator (ie it fell within the UQ for the two ODIs) at PR14. Therefore, any analysis of the impact of the

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[153] Our reasoning is the same as in paragraph 6.203.
[154] This can be viewed as a measure of potential customer detriment, but it may be indicative of whether there is likely to be an adverse impact.
[155] See, for example, Ofwat (July 2015), *Towards Water 2020 – meeting the challenges for water and wastewater services in England and Wales*, p30, which said '… there are methodological difficulties with WTP [willingness to pay] surveys and WTP results varied significantly between regions'.

merger will be overestimated if BW (absent the merger) is not a UQ comparator in the future and the analysis does not account for that. Although a changes matrix is not available across ODIs, data is available for one ODI, number of contacts from customers regarding water quality. To address the issue of examining how SWW and BW might be ranked differently at PR19, we have conducted sensitivity analysis using a changes matrix based on that one ODI.

6.242 Further, in order to estimate the effect of the merger in future years it is necessary to make some assumptions as to how quickly performance will converge. The faster poorer-performing water companies catch up with the better-performing water companies, the lower will be the impact of any merger on the benchmark.

6.243 Ofwat has assumed that the bottom-performing company will close 35% of the gap to the UQ by 2020 for water supply interruptions and 50% for number of contacts from customers regarding water quality.

6.244 Pennon argued that convergence would in practice be much faster and it provided evidence to show that convergence in the overall performance assessment (OPA) – a predecessor measure to the SIM designed to improve performance in core services – was historically much faster.[156] Pennon has also used recent data to show that for number of contacts from customers regarding water quality, the poorest-performing company has already closed 42% of the gap to the UQ; and for water supply interruptions, if Bristol Water is treated as an outlier[157] the poorest-performing company has already closed 50% of the gap to the UQ.[158]

6.245 We have found that although the poorest-performing water company in number of contacts from customers regarding water quality has closed 42% of the gap, another water company's performance has deteriorated, which markedly reduces overall convergence to between 10 and 24%. We note that both Bristol Water and Welsh Water have seen excessive variation in their supply interruption performance in recent years; if both are treated as outliers convergence has only been 4%. These rates are more consistent with Ofwat's assumptions and therefore, in our analysis our central assumption is that the bottom-performing company will close 35% of the gap to the UQ by 2020 for

[156] The overall performance assessment included measures regarding functions of water supply, sewerage services, customer service and environmental performance (Ofwat (March 2004), *Updating the overall performance assessment (OPA) – Conclusions and methodology for 2004-05 onwards*).
[157] Pennon submitted that Bristol Water experienced two incidents which led to significant supply interruptions. These were the largest-scale supply interruptions in Bristol Water's history and Bristol Water described them as exceptional. Pennon noted that Bristol Water had historically been an average performer.
[158] Pennon noted that if Bristol Water was not treated as an outlier then convergence would be much lower.

water supply interruptions and will close 50% of the gap for number of contacts from customers regarding water quality.

CMA analysis of ODIs

Static analysis

6.246 As shown in Table 3, BW performed strongly and SWW performed poorly in the two common ODIs – number of contacts from customers regarding water quality and minutes lost due to supply interruptions.

Table 3: Rankings of the merging parties on the two benchmarked water ODIs, average 2011/12 to 2013/14

	Drinking water contacts		*Minutes lost due to supply interruptions*	
	Score	*Rank*	*Score*	*Rank*
BW	1.13	4	2.76	1
SWW	6.17	18	22.8	15

Source: CMA analysis based on data submitted by Ofwat.

- *Contacts from customers regarding water quality*

6.247 Drinking water contacts are measured as the number of contacts concerning water quality per 1,000 population. BW was one of the top-performing water companies, ranked fourth, with an average of 1.13 contacts per 1,000 head of population between 2011/12 and 2013/14. In contrast, SWW was the poorest-performing company on this measure, with 6.17 contacts per 1,000 head of population. The best-performing company had 0.51 contacts.

6.248 Our analysis shows that combining SWW and BW is likely to lead the merged entity being ranked 16th holding all else equal. The merger therefore may lead to the loss of a UQ company and therefore result in the UQ benchmark at PR14 worsening from 1.23 contacts per 1,000 pre-merger to 1.53 contacts per 1,000 post-merger.

6.249 Applying penalty rates to this change shows the merger resulting in a detriment to customers of £35 million over three years, whilst applying rewards rates shows the merger resulting in a detriment to customers of around £26 million over the same period. In other words, under a static approach where we are considering how regulatory outcomes in PR14 might have been affected by the merger, the loss of a good comparator on number of contacts from customers regarding water quality is predicted to lead to a lower efficiency challenge for other water companies, and hence a potential loss to customers.

- *Duration of supply interruptions*

6.250 BW was the best-performing company, with an average of 2.76 minutes lost per property served. In contrast SWW was one of poorest-performing water companies, ranking 15th, with 22.8 minutes lost per property served.

6.251 Our analysis shows that combining SWW and BW is likely to lead to the merged entity being ranked 11th (with 18.6 minutes lost per property served).

6.252 Therefore, absent any change in performance over time stemming from the merger, the merger may lead to the loss of a UQ company, which results in the UQ benchmark worsening from 12.3 minutes pre-merger to 12.6 minutes post-merger.

6.253 Applying penalty rates to this change shows the merger resulting in a detriment to customers of around £16 million over three years, whilst applying rewards rates shows the merger resulting in a detriment to customers of around £8 million over the same period.

Forward-looking analysis

6.254 How we have approached the forward-looking analysis is described above and detailed in Appendix G.

6.255 Based on the convergence rates set out in paragraph 6.245 we estimate that the merger will have a negative impact on the two ODIs (ie it may make the benchmark less demanding in future), as set out in Table 4. In aggregate the magnitude of the customer detriment is estimated to be £35–£52 million over five years.[159]

Table 4: Forward-looking estimates of the impact of the merger on ODI benchmarks

	NPV £ million, five years	
	Water quality contacts (50% catch-up rate at 2020)	*Supply interruptions (35% catch-up rate at 2020)*
Estimate based on company-specific penalty rate	35.6	16.8
Estimate based on company-specific reward rate	26.1	8.5
Sensitivities on catch-up rate	100%	60%
NPV	8.75	12.5

Source: CMA analysis based on data submitted by Ofwat.

[159] These figures are based on company-specific penalties and rewards. Appendix G presents figures based on median rates which are considerably lower.

6.256 The above method overstates the scale of the customer detriment as it assumes that there is no change in any water company's ranking in future (paragraph 6.241). Given that BW was in the UQ in PR14 for both number of contacts from customers regarding water quality and supply interruptions and based on the relative size of the merger parties, the application of our analytical method means that the merger will always have a negative impact.[160] We have explored whether BW will not be a UQ company in the future.

6.257 Ofwat has produced an estimate of the likely changes based on the available data for number of contacts from customers regarding water quality.[161] Although this may not be reflective of true changes, it allows us to test how our estimates of the detriment are likely to be affected by changes in ranking.

6.258 Ofwat's analysis suggests that if we apply a changes matrix the detriment may be around one-third of that estimated without accounting for changes in rankings. Based on penalty rates, this reduces our estimates of the scale of the customer detriment to around £13 million for customer contacts regarding water quality and £10 million for duration of supply interruptions, both over five years, giving a combined customer detriment of £23 million over five years. Based on rewards, our estimates of customer detriment are around £9 million for customer contacts regarding water quality and £6 million for duration of supply interruptions, both over five years, giving a combined customer detriment of £15 million over five years.

6.259 Although this method does have limitations, we do consider that it offers the best available indication of the magnitude of the detriment since it: *(a)* attempts to account for possible future changes in rankings between water companies; and *(b)* accounts for expected future convergence in performance between water companies. However, we do consider this quantification to be indicative of the magnitude of the impact rather than a robust measurement of that impact (paragraph 6.222). Further this method of establishing an indicative measure does not account for any mitigating factors to the magnitude of the detriment.

6.260 Pennon submitted that these included that the parties would continue to report separately on ODIs for the remainder of the PR14 period and, noted in any

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[160] The relative size of the merger parties is relevant since SWW is significantly larger than BW which means that when we combine the two for the purpose of our analysis the merged entity will be closer to SWW's ranking position than BW's.

[161] Pennon suggested using a changes matrix based on OPA or SIM. However, we do not consider this is appropriate as water companies are more likely to be able to change their rankings in these measures as OPA and SIM do not rely on infrastructure.

case, Ofwat was able to set benchmarks and targets in wastewater with fewer comparators. These are considered in the following paragraphs.

- *Potential mitigation through separate reporting*

6.261 Pennon submitted that the parties would continue to report separately on ODIs as they were obliged to do so in order to demonstrate that they had met their PR14 PCs. Further, Pennon submitted that it had no plans to remove local operational staff, such that the separate reporting should provide sufficiently independent data to allow for comparison purposes at PR19.

6.262 Data from BW and SWW would therefore be available to Ofwat to form a part of its setting of ODI benchmarks for PR19 on the same basis as was available in PR14.

6.263 Ofwat argued that although separate data would continue to be available until 2020, to allow for performance to continue to be assessed against the PR14 ODIs for BW and SWW, these data would be less valuable as a result of the merger as the management practices will become more homogenous in the two regions. In particular Ofwat argued that it was possible that the performance in the BW region could reduce significantly following the merger as the management practices of SWW (historically, a poorer performer) were most likely to prevail across both operating regions, leading to a less stringent benchmark in the future.

6.264 We have considered Ofwat's submission that BW's performance may decline as a result of the merger, due to the introduction of SWW's management practices.

6.265 We note that in PR14 Ofwat only used the most recent three years of data to set the UQ benchmark.

6.266 It is not clear how the integration of management will change performance significantly in the PR14 period.[162] Ofwat has submitted information on operation management and asset performance to argue that management focus can change ODI performance. In Ofwat's view, evidence from actual performance shows that SWW has been unable to improve its water quality discolouration contacts performance despite receiving a larger proportion of water non-infrastructure budget in this area than other WaSCs. Ofwat

[162] We note in this context that BW's average performance over the three years used in PR14 was 1.13 contacts per 1,000 customers and its target to 2019/20 is 1.23 from a 2014/15 starting level of 1.25. This compares with the UQ level without BW of 1.53 contacts per 1,000 customers and SWW's average performance (2011–2013) of 6.17.

believes that this indicates that SWW management has not focused on this area. However, Pennon has informed us that water discolouration in SWW's area is driven by a combination of abstraction sources and mains condition, and as such significant investment would be required to reduce discolouration contacts.[163]

6.267 This illustrates that there are complexities in interpreting different performance by water companies on ODIs. Our analysis of ODIs suggested that whilst some variance in performance would be due to short-term management interventions at the appointee level, other factors would also be relevant, including regional management and the condition of the relevant assets. We consider that the true extent of how quickly the merged entity can change its performance in meeting its ODI targets is likely to lie somewhere in between what the merger parties and what Ofwat consider it to be.

6.268 If integration leads to no change in performance relative to the parties remaining independent, separate reporting of data will allow Ofwat to continue to treat the parties as separate entities when setting the PR19 price control and performance targets.[164] Ofwat believes that there is a risk that performance in the BW area will decline as SWW is a poorer performer in the ODI measure where benchmarking has been used. In contrast, Pennon submitted that it would take the best of both companies, and as such services would improve in both areas. We have not found sufficient evidence for us to conclude on whether Ofwat's submission that performance might be worse than average, or Pennon's submission that it might be better, is the more likely. Therefore, we have chosen to use only our central assumption that the performance of the merged entity is a weighted average of the parties' pre-merger performance.

6.269 In this context it is important to note that BW and SWW will continue to be bound by their separate PR14 settlements, and as such, if BW's performance were to decline prior to PR19, it could incur financial penalties (depending on how much performance falls by). However, Ofwat argued that these financial incentives might not be strong enough to ensure that BW maintained its current performance. In particular, Ofwat argued that Pennon had identified synergy savings of around £[✂] a year, whereas the maximum penalty was £342,000 a year. Ofwat's position is that in the event that there was a link between the synergy savings and ODI performance it might be profitable for Pennon to incur the financial ODI penalty to benefit from a synergy saving. However, in the absence of evidence of such a link, it is difficult to conclude

[163] Pennon submitted that SWW's performance has actually been better than indicated by Ofwat.
[164] Separate reporting of ODI performance was supported by the CCWater in its response to our provisional findings.

that the presence of synergy savings offsets or negates the financial ODI incentives. Therefore, Pennon will not only maintain separate reporting through to PR19, but we consider it will have a financial incentive to ensure that BW performance does not fall.

6.270 Ofwat has submitted that, in principle, it will lose the benefit of independent management, and that therefore its ability to set an effective benchmark will be reduced. We agree with Ofwat that there will be some incremental reduction in independent management. However, in particular in respect of the two ODIs where there has been quantification, our review suggested that Ofwat should be able to use separate data (which it will have from both before and after the merger) as part of its assessment of ODIs in PR19. Ofwat will have data for 2016/17 and 2017/18 that is partially influenced by new management, and previous data that is fully independent. In other words, if Ofwat wished to continue to use BW as a comparator in setting ODI targets in PR19 (ie up to 2025), it seems to us that the combination of existing performance and separate reporting is likely to mean that this remains feasible.

6.271 Ofwat submitted that the impact beyond 2025 was too uncertain to model because of uncertain rates of convergence and subsequent expected future rankings, and because of uncertainty over what the future threshold level will be.[165] We agree and therefore our analysis has only attempted to quantify the impact of the merger on ODIs up to 2025. Therefore, our analysis is restricted to quantifying the impact of the merger at the PR19 price control. The PR19 price control is likely to draw on data from the preceding five years to set the ODI benchmarks, although it may only use data from a subset of years. The merger will only affect two or three years of this data. We note that the parties are obliged to continue to report independently until the end of PR14, and that the PR14 settlement gives Pennon an incentive to maintain the ODI performance of BW. Thus, on balance we consider that Ofwat will be able to use the separately reported data to set targets at PR19.

6.272 In respect of Ofwat's ability to set targets for ODIs more generally, we note that there are a number of factors that indicate that the loss of BW as an independent comparator will not prevent Ofwat from setting targets using comparators:

(a) At PR14 differences in other ODI targets between water companies reflected the differences in views of their CCGs. These will take into consideration the regional circumstances, for example differences in the

[165] Ofwat's initial submission, p67.

condition of existing assets or differences in the long-run economic level of performance. Therefore, the use of comparisons is likely to be only one of several factors used in setting ODI targets for PR19. This means that the loss of one independent comparator through a merger will have a smaller impact on Ofwat's ability to set a challenging benchmark compared to a benchmark which does not take into account views of local customers.

(b) There are likely to be differences in the economic level of performance between different water companies. This makes the use of comparators more inherently uncertain, and implies a greater need to consider specific circumstances, consistent with the overall approach to ODIs.

6.273 As a result, while we agree that the merger will reduce the number of independent comparators, we consider that there are also a number of mitigating factors which mean that the scale of the impact on Ofwat's ability to make comparisons will be more limited than in other areas.

Conclusions on ODIs

6.274 We have assessed the merger's impact on Ofwat's ability to set demanding targets on the common ODI PCs and in doing so have attempted to quantify the scale of customer detriment.

6.275 We have provided an analysis above using an approach which broadly assumes a continuation of UQ regulation for the number of customer contacts regarding water quality and duration of supply interruptions. We recognise that BW is currently a top performer. If BW were to remain a top performer, we found that the impact of the merger on ODI targets could be as much as £35 million to £52 million over five years under the forward-looking approach (see paragraph 6.255).

6.276 However, evidence of significant fluctuations in performance in the context of industry convergence suggests that the likely impact is materially lower. Allowing for some convergence in performance of the bottom-performing company closing 35% of the gap to the UQ by 2020 for water supply interruptions and closing 50% of the gap for number of contacts from customers regarding water quality, suggests that the scale of the potential detriment (which would be within PR19) is around £15 million to £23 million in total (over five years) (paragraph 6.258).

6.277 Furthermore, we consider that the continuation of separate reporting, and the evolving nature of outcome and quality of service regulation through ODIs, mean that the potential customer detriment can only be partly quantified in

this way. In other words, we do not consider that Ofwat would fully lose the value of BW as a separate comparator for PR19, which is the period during which, consistent with Ofwat, we have sought to quantify the effect.

6.278 We consider that the potential customer detriment could be lower than the estimate of £15 million to £23 million over 5 years to reflect:

(a) that the companies will retain separate reporting, and Ofwat will have independent measures for a number of years, at least up to most of 2015/16 (paragraphs 6.261 to 6.262);

(b) that the operational causes of customer contact regarding water quality and duration of supply interruptions are at least in part related to the performance of the existing water assets and local operational management, and therefore separate reporting will be likely to result in Ofwat continuing to receive data that is at least partly independent (paragraphs 6.266 to 6.268);

(c) that measurement of the two common ODIs of interest in this inquiry did not rely on common definitions across all 18 comparators in PR14 but rather common definitions were applied to 11 comparators for both customer contact regarding water quality and duration of supply interruptions. Ofwat may be able to increase consistency across water companies in its comparators set for PR19 (paragraphs 6.226 and 6.227); and

(d) that Ofwat has indicated that it is likely to consider adjustments to ODI benchmarking at future reviews (paragraph 6.271).

6.279 We have been mindful that ODI targets were introduced at PR14 and there is some uncertainty in any forward-looking analysis of the merger's impact. As discussed, this uncertainty includes the reliability of quantifying the impact, rates of convergence in performance, how rankings between water companies may be expected to change and what threshold will be set in the future.

6.280 We therefore concluded that the merger could be expected to have an adverse impact with respect to setting ODI targets. However, given the mitigating factors discussed above we were not persuaded that the adverse impact was likely to be significant.

Monitoring and incentivising service quality: service incentive mechanism

How Ofwat uses comparators in monitoring and incentivising service quality through the SIM

6.281 The SIM is described in paragraphs 3.22 and 3.24. As water companies are rewarded or penalised financially for their performance relative to the rest of the industry, comparisons are critical to the operation of the SIM and providing incentives to water companies. The SIM is incorporated into the household retail price control for all English and Welsh companies. In the absence of the opening of retail activities to competition for all non-household customers in Wales, Ofwat uses a separate SIM to measure and incentivise non-household retail performance of the two Welsh water companies. This uses comparisons of the performance of the Welsh water companies with those in England.[166]

How a merger might result in adverse impacts

6.282 A merger will lead to two water companies that previously reported their SIM scores separately, reporting a single combined SIM score.[167] This will reduce the number of data points available for comparisons and, in most instances, will lead to a change in the dispersion of results across the industry and as such a change in the standard deviation.[168]

6.283 As Ofwat bases its penalties and rewards on the distribution of the SIM data, a merger may mean that the point at which penalties and rewards are given becomes less demanding. This may reduce the amount of effort that water companies need to expend to meet their SIM target, making the SIM a less-effective regulatory tool and customers face a worse complaints experience as a result. Therefore, we have assessed the impact of the merger on industry penalties.

Pennon's submissions on the SIM

6.284 Pennon submitted that there was likely to be no detriment resulting on the SIM beyond 2020.

6.285 Pennon said that in analysing the SIM convergence to date it had found that, between 2011/12 and 2013/14, the standard deviation in SIM scores reduced from 8.8 to 5.0 SIM points. It argued that this suggested that a high degree of

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[166] ibid.
[167] Note that in this case separate reporting will be maintained until 2019.
[168] If the two water companies are equidistant from the median, depending on their relative size, a merger may not have an effect on the distribution.

convergence was already present in the industry thereby making comparisons less useful. On this point, Pennon told us that Ofwat's own forecasts for SIM scores indicated that SIM scores were likely to converge by 2020, where by the start of PR19 it forecast that the range of SIM scores was set to fall to below a single point.[169]

6.286 Pennon further submitted that the qualitative component of the SIM (which will make up 75% of the overall assessment in PR19) has a measurement error of +/- 3.5%.[170] This, together with the expected level of future convergence, would suggest that assessing the SIM after 2020 introduces a high level of uncertainty in the analysis.

6.287 Pennon also believed that Ofwat's reliance on SIM would be reduced in future since Ofwat could use other sectors in setting their different incentive measures.[171] To the extent that quantification is conducted, Pennon submitted that it would take time for operations to be integrated so quantification should not commence until after 2016/17 and it should take account of the probability future changes in performance. Ofwat said:

> While we stated that we considered the SIM was appropriate to drive improvements for 2015 onwards. We have also stated that water companies are unlikely to provide as much value as retail comparators beyond 2015-2020 as Ofwat could offset the loss of a water company benchmark by greater reference to other sectors.[172]

Ofwat's submissions on the SIM

6.288 Ofwat submitted that BW had performed well on the SIM since 2011/12 whereas over this period SWW had been ranked in the bottom quartile. Ofwat assessed that removing an independent high-performing company would result in an overall detriment of £6 million (to 2020) under the static approach or £8 million (from 2020–2025) under a forward-looking approach.

6.289 In its submissions Ofwat has assumed that the SIM would be replaced after 2025 following a high degree of convergence after 2020 and therefore it has analysed the impact of the merger only up to 2025. For its forward-looking approach, Ofwat adopted a probability of change matrix based on SIM scores

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[169] Ofwat (2014), Benefits of comparators.
[170] Based on Ofwat's SIM survey 2012/13 on a sample of 800 observations (McCallum Layton (2014)).
[171] As mentioned in the paper Europe Economics, 'Valuing the Impact of Mergers and Identifying Undertakings in Lieu' (18 May 2015), section 3.2.1.
[172] Ofwat (May 2015), Consultation on Ofwat's approach to future mergers and statement of method.

to date. It quantified the impact using the existing schedule of rewards and penalties.

CMA's analytical approach to the SIM

6.290 Our baseline scenario for both the Static and the forward-looking approaches is a weighted average[173] of the two parties' existing SIM scores.[174] However, we have also included extra sensitivities for the merging parties both performing at the level of the best-performing party.

6.291 In determining our analytical approach we have considered:

- how the merged entity would have performed in the past and how it will perform in the future. By making such assumptions, SWW and BW can be substituted for the new merged entity, which will allow us to simulate whether the merger would have had an impact either on the most recent price review, or a future one;
- the degree of future convergence in SIM upon which the end date for any adverse impact is based;
- the date when the merging parties will successfully integrate, the start date after which any adverse SIM impact will occur; and
- the date until which the two companies will continue to report separately, which could mitigate any adverse impact from the merger.

6.292 In their submissions Pennon and Ofwat have taken different approaches to combining the companies' historical SIM data. Ofwat has taken the weighted average of the two parties' historical SIM scores in the static analysis, and used a changes matrix to forecast this for the forward-looking approach.

6.293 In contrast, Pennon submitted that it would expect the new entity to have a different SIM score to that of SWW without the merger, as the business case for the merger stated that one of the key benefits was expected to be an improved level of customer service utilising the best practice of both companies.[175] Therefore, Pennon submitted that it expected the merged entity

[173] Since the SIM is a qualitative measure of service performance, we have weighted each party by the number of households it serves.
[174] Note that since SIM is a qualitative measure we need to have regard to the relative size of the merging parties as SIM will be based on the performance across the merged entity. Hence, if there is no change in performance, the performance of the new water company will be lower than the simple average of BW and SWW, as BW's customers will comprise a smaller percentage of the merged entities' customers than SWW.
[175] Pennon Group Plc (2015), 'Acquisition of Bournemouth Water – The rationale and business case', p5.

to have a SIM score ranging between the weighted average of SWW and BW combined and the higher merger future commitments of the two entities.

6.294 We acknowledge that it is at least possible that the merged entity may either achieve the performance of the best-performing party pre-merger, or achieve a level of performance that surpasses that, subject to both the parties having better practices or solutions in some areas. However, in order to achieve increased performance of one of the merging parties, the merged entity will have to successfully integrate services, whilst ensuring that standards are maintained.

6.295 We have adopted a similar methodology for quantifying the future impact of the merger on the SIM to that used to forecast the wholesale cost benchmark from historical data. We have calculated a changes matrix (based on one-year changes in ranking) to estimate the probability of a company achieving a particular ranking. Whilst SIM data was available from 2010/11, we note that Ofwat used data from 2011/12 to 2013/14 for the purposes of determining the incentive rewards and penalties at PR14 as 2010/11 was the trial year in which the SIM was introduced. We used this data to estimate a changes matrix showing the probabilities of different one-year changes in ranking.

6.296 In terms of convergence, we have noted the considerable convergence to date and consider that convergence is likely to continue such that the impacts in SIM beyond 2020 are likely to be relatively small. However, as Ofwat submitted that SIM will remain in use until 2025, we have monetised the impact of the merger until 2025.

6.297 With respect to the date when the merging parties successfully integrate:

- Ofwat has taken a start date of the beginning of 2016/17 whereas Pennon has used a start date of midway through 2017/18. Pennon has chosen this later start date because it argued that any merger integration was unlikely to be finished until mid-2017/18, so any hypothetical SIM impact before 2017 would have occurred pre-merger.

- This assumption has a relatively significant impact on results if we consider that continued convergence will be rapid because any potential adverse impact occurring in the near future will be greater than any impact occurring in the period beyond 2020.

6.298 We consider that Pennon's suggestion is the most appropriate given that it is likely to have the best view of the earliest date by which it could fully integrate with BW, so this is the assumption used in our baseline scenario. However, we acknowledge that there is some uncertainty around the starting date of the impact of the merger, so we have used Ofwat's start date as a sensitivity.

6.299 Both Parties have also considered whether the availability of separately reported SIM data could mitigate any adverse impact. Separate reporting would be likely to occur only until 2019. The merger would affect the SIM penalties (affecting the mean and the distribution of the SIM data) from 2020 onwards. This would mean that the merger would only have an impact on the SIM between 2020 and 2025.

6.300 Overall, given the level of convergence, the timing of integration and the uncertain performance of the merged entity, we have looked at the impact of the merger through a baseline scenario and a range of estimates. We have done this by using both a static and a forward-looking approach. However, we consider that the forward-looking approach is likely to be more reflective of the true impact of the merger given that the significant rate of convergence in SIM means that historical impacts on SIM are unlikely to be meaningful.

6.301 Finally we note that after the merger Ofwat would have 17 independent water company comparators. Therefore, we have focused on whether the merger would prejudice Ofwat's ability to set effective incentive structures to improve SIM performance going forward.

CMA analysis of the SIM

Static analysis

6.302 The same static approach is used in analysing the SIM as was used in analysing the wholesale cost benchmark. In particular, we follow Ofwat's approach in calculating the effect of the merger as if it had happened prior to PR14, using the companies' rankings at PR14. BW was ranked second in PR14, whereas SWW was ranked 16th. Due to the difference in the sizes of the merging parties, this means that the combined entity is expected to rank 14th.

6.303 This merger causes a change in the mean and the standard deviation of the SIM scores, in each of the three years, which is shown in Table 5.

Table 5: Mean and standard deviation of SIM

	2011/12	*2012/13*	*2013/14*
Mean pre-merger	73.67	77.82	81.60
Mean post-merger	73.24	77.49	81.45
Standard deviation pre-merger	8.77	7.79	5.03
Standard deviation post-merger	8.46	7.56	4.81

Source: CMA analysis based on Ofwat data.

6.304 Applying the schedule of rewards and penalties to these changes results in the merger reducing industry penalties by £6.1 million over the three years (implying a worse outcome for customers).

Forward-looking analysis

6.305 Using the approach detailed in Appendix H, we have projected SIM score outcomes. Applying the schedule of rewards and penalties to these revised scores we find that the merger will lead under our baseline scenario to a reduction in industry penalties of £2.8 million over eight years (implying a worse outcome for customers).

6.306 Our sensitivity analysis is also reported in Appendix H based on assumptions around the performance of the merged entity, the integration date of the merger and a separate reporting period for the merging parties. These sensitivities show that the impact on the SIM penalties might range from a reduction in penalties of around £980,000 to £3.8 million over the period until 2025.

Conclusion on the SIM

6.307 In PR14 BW ranked highly in the SIM whereas SWW did not. By combining BW and SWW into a single entity, based on the static approach, we found that the merger would result in the removal of a high-performing company with a resultant reduction in industry penalties of around £6 million over three years (paragraph 6.304).

6.308 However, our analysis has found that there has been a considerable level of convergence in SIM scores over recent years. Taking account of expected future convergence (and allowing some time for integration of SWW and BW to take place), we expect that the merger is likely to lead to a reduction in industry penalties of £2.8 million over eight years, implying a worse outcome for customers. The sensitivity analysis that we applied showed that the merger's impact could range from a decrease in penalties of around £980,000 to around £3.8 million over the period until 2025 (implying a worse outcome for customers) (paragraph 6.305 to 6.306).

6.309 We therefore concluded that the merger could be expected to have an adverse impact regarding the SIM. However, we consider this adverse impact to be small.

Spreading of best practice

How Ofwat uses comparators in spreading best practice

6.310 In addition to the use of comparisons already discussed in this report, Ofwat also uses comparisons in qualitative terms. We summarise Ofwat's approach to spreading of best practice below, split into three areas:

(a) **Ongoing monitoring**: a qualitative assessment of how water companies are performing in the context of Ofwat's duties including financial performance and resilience of systems and services.

(b) **Enforcement**: where Ofwat can draw on performance within the industry as support in addressing poor performance against regulatory requirements.

(c) **Spreading best practice**: the use of reviews of individual company plans and activities, in particular high-performing water companies, to propose new approaches to regulation across the industry.

How a merger might result in adverse impacts

6.311 By reducing the number of comparators available to Ofwat (and hence potentially reducing the availability of examples of best practice upon which Ofwat can draw and/or company-specific factors that generate best practice), a merger might reduce Ofwat's ability to identify and spread best practice across the industry or its ability to monitor or enforce.

Ofwat's submissions on spreading of best practice

6.312 Ofwat told us that areas where customers benefited from the spreading of best practice at PR14 included (but were not limited to):

- business planning;
- design of ODIs;
- reviews of special cost factors (both for the wholesale and the retail price controls);
- retail cost allocation;
- customer research; and
- social tariffs.

Business plans

6.313 Ofwat said that, while it did not always draw explicit comparisons between water companies in its published documents, it made extensive use of comparisons in assessing company claims through its internal plenary discussions and such comparisons were central to giving it confidence that the challenges it made were appropriate, taking account of its statutory duties.

6.314 It said that in the risk-based review, water companies whose plans were not assessed as 'acceptable' or 'exceptional' looked to those plans which were, before submitting their own revised business plans. Ofwat said that, during several meetings held with water companies following the risk-based review, it was able to point to the best practice approach of other water companies, and this had fostered a proactive response from the water companies, in particular in developing and proposing PCs and ODIs.

6.315 By way of example, Ofwat told us that it had pointed Dee Valley Water to the good practice approaches of other water companies in engaging with customers regarding the business plan, proposing ODIs and proposing special factor cost claims. Ofwat said that the fact that other water companies of a similar size, such as BW and Portsmouth Water, were working positively to address issues raised in the risk-based review gave it confidence that it was correct not to treat Dee Valley Water any differently in the development of its revised business plan.

6.316 Ofwat said that the use of comparators provided it with confidence that the challenges it made to water companies in specific areas were appropriate. For example, the fact that the two water companies pre-qualified for enhanced status (SWW and Affinity Water) accepted its risk and reward guidance and cost of capital gave it confidence to resist calls from other water companies for a higher cost of capital. Similarly, the fact that other water companies which had failed to deliver stable serviceability during the 2010–2015 period (as set down in price limits at PR09) had proposed (or accepted) shortfall adjustments to the RCV gave it confidence to intervene with Southern Water and apply a shortfall adjustment in both the draft and final determinations.

Design of outcome delivery incentives

6.317 Ofwat told us that it was clear from discussions with the 16 water companies which had not been awarded enhanced status that many of them had compared their PCs to those of the enhanced companies and this had influenced their revised business plans. It said that this self-comparison probably reduced the need for interventions by Ofwat at draft determinations.

6.318 Ofwat said that it had held a workshop in April 2014 on outcomes, risk and reward at which it had disseminated feedback on PCs and ODIs. It said that in most cases the feedback was drawn from a qualitative comparison of good and poor practice across water companies, and that it used specific examples of good practice from SWW, Affinity Water and Portsmouth Water in the presentation slides.

Reviews of special cost factor wholesale cost claims

6.319 Ofwat said that, in many cases, when assessing special factor claims related to adjustments to its wholesale cost models, it made use of comparisons between water companies. Where water companies said they were different from the average or had unusual operations or costs and did not provide appropriate evidence, Ofwat used its internal data sets and knowledge of other water companies to test their arguments.

6.320 Ofwat gave us a number of examples where it had made comparisons (both qualitative and quantitative) across water companies in assessing special cost factor claims although these examples did not include either SWW or BW.

Retail cost allowances

6.321 Ofwat told us that it used qualitative and quantitative evidence provided by water companies in their business plans to challenge other water companies' plans on several areas of retail. For example, several water companies included plans to invest in new customer relationship management and billing systems in PR14. It said that BW and Northumbrian Water addressed the gaps Ofwat had identified in their resubmitted business plans which provided Ofwat with useful evidence of what a good approach to the provision of evidence in this area should look like. This gave it greater confidence in setting its challenge to other water companies.[176] Ofwat said that Thames Water had proposed an ODI which it replicated to address its concerns for other water companies proposing billing system investments.

Customer research

6.322 Ofwat said that a critical part of the business planning process was for companies to demonstrate that they had engaged effectively with customers and had a robust approach to mapping willingness to pay information to proposed outcomes. They were also required to demonstrate customer support for their plans.

6.323 Citing a number of examples, Ofwat told us that comparing the approach taken to customer research across companies, where some companies demonstrated more robust research than others, gave it confidence that its

[176] Note that Pennon told us that merger due diligence identified a significant overspend by BW (approximately 40%), delay on the implementation of this system (from June 2014 to February 2015) and reduction in scope in terms of existing system integration. (Source: Pennon's comments on Ofwat's initial submission to the CMA, paragraph 8.5.)

challenges to those companies which it assessed as 'more evidence required' or 'significantly more evidence required' were appropriate.

Other innovations – social tariffs

6.324 Ofwat told us that one example of an area where water companies had innovated to implement best practice was the widespread adoption of social tariffs following the actions of a small number of early adopters.[177] It said that it had undertaken a survey of water companies' approaches in 2013 and had identified industry best practice at an industry workshop.

6.325 It said that three water companies had had social tariffs available since 2013/14, and it had approved social tariffs for a further three water companies in 2014/15. Ofwat said that there was evidence to suggest that the spread of social tariffs across the industry gathered momentum as water companies became more aware of each other's approaches and business plans. It said that by the time water companies had submitted their PR14 business plans, 17 of the 18 water companies were either planning to implement or were researching the possibility of their own social tariffs. The last company, Yorkshire Water, had originally rejected implementing a social tariff in its business plan on the grounds that research it conducted did not demonstrate customer support. However, Ofwat told us that the company reversed its decision after proactively conducting new research in 2014 which found that 75% of customers now supported the company's updated social tariff proposal.

Ongoing monitoring

6.326 Ofwat has recently published a consultation on the framework under which it would monitor the financial stability of the regulated water companies.[178] Ofwat told us that the intention was to have a clearer and broader view of solvency, liquidity, risk management and longer-term financial viability in light of anticipated investment programmes. This would enable it to identify those water companies whose financial metrics were deteriorating over time. It said that comparative reporting in this area would create a reputational incentive for all water companies to be transparent about their ownership, financial and governance structures.

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[177] Social tariffs refer to those instances where water companies reduce charges for individuals who would otherwise have difficulty paying their bill in full. Water companies achieve this via cross-subsidies (Flood and Water Management Act 2010, section 44).
[178] Ofwat consultation on financial monitoring framework.

6.327 Ofwat said that it expected to continue to take in-depth, targeted reviews of specific issues that were important for monitoring company performance and spreading of best practice, and which could also be relevant to how it gathered comparative data that may be relevant to setting price limits in the future. It said that it expected to carry out a targeted review in January to March 2016.

6.328 Ofwat said that it was currently consulting on the approach to its new primary duty under the Water Act to further the resilience objective.[179] It said it would need to create the right regulatory framework to enable, incentivise and encourage water companies to plan and invest for resilient systems and services now and in the future. It said that as it developed its approach to the duty, it might draw comparisons between water companies in this context.

6.329 Ofwat told us that it had challenged water companies to agree a set of service levels for their developer services activities against which they would regularly report their performance. Water companies agreed these in April 2015 and published their first quarterly report in July 2015. It said that commitment that water companies would regularly report their performance would not only improve transparency, but would encourage those water companies lagging behind to catch up. Ofwat had also asked all water companies to review the information on their websites about the self-lay option for developer services and how customers accessed the information and services they needed for this. It said that it was undertaking a comparative analysis of the information water companies provided with a view to sharing good practice that would better enable an effective self-lay market.

Pennon's submissions on spreading of best practice

6.330 Pennon submitted that the merger would not reduce the spread of best practice in the industry. It said that best practice of working arrangements through innovation was more likely to arrive through mergers than more informal sharing routes.

6.331 Further, Pennon said that BW was not important in any of the examples provided by Ofwat (paragraphs 6.313 to 6.325).

6.332 Pennon told us that SWW had provided extensive evidence to Ofwat on bad debts which was used by Ofwat to challenge other water companies' cost allowances in this area. It said that the example given of Ofwat using BW's

[179] Ofwat consultation on its new role in resilience.

customer relationship management system as a way of challenging other companies' business plans was not credible in its view due to BW over-spending in this area. It said that there was no impact from the loss of BW as a comparator in this area.

6.333 In terms of customer research, Pennon submitted that SWW was identified as an exemplar in this area by Ofwat and there was therefore no impact from the loss of BW as a comparator in this area. It said that the merger would enable SWW's best practice customer research to be embedded at BW.

6.334 Finally, Pennon told us that SWW was identified by Ofwat as an exemplar in the design of social tariffs but there would be no impact from the loss of BW as a comparator in this area. It said that SWW would help BW provide a social tariff post-merger.

CMA analysis of spreading best practice

6.335 We considered the points raised by Ofwat and Pennon carefully. We considered that, while there is some merit in being able to highlight best practice and encourage water companies to emulate it or adopt innovative approaches pioneered by other water companies, there was limited evidence that the loss of BW as an independently owned comparator would materially affect Ofwat's ability to spread best practice in the future.

6.336 We considered that, as BW is a small WoC facing relatively unique circumstances in its local market, the ability of other, generally significantly larger, water companies to apply lessons learned from it in their own areas is fairly limited. We note that Ofwat identified examples of where it was able to use good practice from BW in providing incentives to other small companies to provide high-quality information.

6.337 Much of Ofwat's evidence also demonstrates that its approach to price regulation is largely based on quantitative benchmarking analysis, and therefore does not take into account individual company initiatives across much of the value chain. This will limit the role of spreading of best practice. For example, Ofwat's PR14 approach to wholesale cost assessment relies on benchmarking, rather than reviews of company investments, for setting allowances for all areas of water companies' wholesale costs.

6.338 We noted that much spreading of good practice around the industry occurs under the auspices of the industry organisations including CCWater, UK Water Industry Research and Water UK. We also saw evidence that innovation was taken forward at the instigation of water companies themselves upon seeing their position in league tables published by Ofwat, in addition to

specific initiatives instigated by Ofwat. We also noted that BW will continue to report separately, at least during the PR14 period, and so will continue to be available as a comparator until 2020.

6.339 We also noted that the water industry is changing over time, for example with the introduction of non-household retail competition from 2017 and the likely introduction of further competition subsequently, and with increasing convergence in performance levels. We considered that the use of comparators may not be as relevant in the future to the spreading of best practice as it may have been in the past.

6.340 On ongoing monitoring and enforcement, we considered that Ofwat had not provided evidence on the impact of the loss of the merger parties as independent comparators.

Conclusion on spreading best practice

6.341 During the course of our inquiry we have heard about a number of areas where BW or SWW have been identified as being at the frontier of industry best practice. For example, BW's customer relationship management system and SWW's customer research.

6.342 We also found that Ofwat's approach to regulation did allow it to spread best practice in company behaviour (for example, on social tariffs).

6.343 However, we also found:

- the spreading of best practice involves a number of methods of which the use of comparators is only one; and
- any best practice specific to small water companies will impact only a very small proportion of the overall industry.

6.344 We therefore find that the loss of BW as an independently owned comparator, and the consequent reduction in the number of independently owned comparators from 18 to 17, would not result in an adverse impact regarding Ofwat's ability to encourage good practice or assess qualitative aspects of submissions made by water companies during future price control reviews.

6.345 On ongoing monitoring and enforcement, we considered that the evidence did not relate to the impact of the loss of the merger parties as independent comparators. We therefore concluded that the merger would not adversely impact Ofwat's ability to monitor performance or enforce regulatory provisions.

7. Conclusions on prejudice

7.1 We have examined the impact of the merger on several of Ofwat's regulatory functions, namely: setting wholesale price controls; setting retail price controls; setting ODI targets; setting the incentive structure in SIM; and in Ofwat's spreading of best practice, including monitoring and enforcement activities.

7.2 In this section we consider whether the impacts identified in our analysis are, or may be expected to be, adverse and significant enough to amount to prejudice to Ofwat's ability to make comparisons between water enterprises.

7.3 In this case Pennon has acquired the entire issued share capital of BWIL. Therefore, we consider that Pennon has full control over SWW and BW. We note that following the merger, Ofwat will have 17 independent comparators available. Moreover, throughout our inquiry we have not had any reason to consider that the underlying costs of SWW and BW are anything other than independent of other water companies or each other before the merger. We have made our assessments on this basis.

7.4 In relation to the setting of wholesale price controls, we have found that the merger can be expected to result in a reduction in precision of Ofwat's wholesale efficiency benchmarking models. There are inherent difficulties in any approach which seeks to quantify the impact particularly given the complexity of Ofwat's benchmarking models. In examining this question we have applied three quantitative approaches (the General Approach, Specific Approach and bootstrapping) and, in addition, we have undertaken a qualitative analysis looking at BW's characteristics as they relate to the individual variables that Ofwat uses in its modelling. We have found that a reduction in precision in Ofwat's totex estimate of around 4%, from 4.9% to 5.08%, is the most reasonable estimate available to us. Our own analysis has a number of limitations and we have been mindful that it is an indicative impact rather than a definitive measure. The reduction in precision can be considered as all water companies' costs being a combined £6.3 million less precise in total in any given year. Therefore, the average water company's costs is likely to be around £350,000 less precise in any given year. This measure should not be interpreted as a direct estimate of consumer detriment from loss of precision. We did not consider this adverse impact to be significant (see paragraphs 6.169 to 6.170 and 6.174).

7.5 Our qualitative assessment corroborates our finding on the precision effect. Analysis of the individual variables most affected by the removal of BW from the modelling suggested that although the merger will lead to some loss in

variation in Ofwat's data, any resulting loss in precision is likely to be small (paragraph 6.171).

7.6 With respect to the setting of the wholesale benchmark itself, we have found that the merger is likely to have an impact that is either not adverse or adverse but small. We estimate that the adverse impact on the benchmark is equivalent to a customer detriment of around £9 million over 25 years (in NPV terms) (paragraphs 6.175 to 6.177).

7.7 Considering the precision and benchmarking effects together we therefore concluded that the merger is likely to result in some adverse impact on the setting of wholesale price controls but we do not think that the adverse impact is significant (paragraph 6.179).

7.8 With respect to retail price controls, there is some uncertainty surrounding how Ofwat will approach setting household price controls at the next price determination (paragraph 6.195). This uncertainty centres on the benchmark level that Ofwat will choose although Ofwat has told us that it will not be at the ACTS level which was used at PR14. Given that uncertainty we have not found it necessary to undertake a static analysis of the merger. However, since Ofwat has told us that it intends to use a benchmark based on an efficient CTS measure, we have been able to apply a forward-looking analysis.

7.9 We undertook our analysis using a range of assumptions on how the current poorer-performing water companies are likely to converge to the performance levels of the top performers. We concluded that the merger is likely to result in a more stringent price control (that will benefit customers). We therefore concluded that the merger is unlikely to result in an adverse impact on Ofwat's ability to set household retail price controls (paragraphs 6.210 to 6.212).

7.10 As regards the effect on ODIs, at PR14 Ofwat used comparative assessments to identify UQ performance targets for three common ODIs in regulating the provision of water:

- the duration of supply interruptions;
- the number of contacts from customers regarding water quality; and
- mean zonal compliance.

7.11 Our analysis did not find any adverse impact resulting from the merger on mean zonal compliance. Although both BW and SWW were in the UQ in mean zonal compliance at PR14, all water companies achieved very similar

average scores between 2011/12 and 2013/14. As a result the merger is unlikely to lead to any effect on the benchmark.

7.12 Allowing for some convergence in performance of the bottom-performing company closing 35% of the gap to the UQ by 2020 for water supply interruptions and closing 50% of the gap for water quality contacts, suggests that the scale of the potential detriment (which would be within PR19) is around £15 million to £23 million in total (over five years) (paragraph 6.276).

7.13 However, we consider that the continuation of separate reporting, and the evolving nature of outcome and quality of service regulation through ODIs, mean that the actual impact of the merger on Ofwat's ability to make comparisons in setting ODIs can only be partly quantified in this way. In particular we have placed weight on the parties providing separate reports throughout the life of the current determination period and those reports can be considered to be independent to at least 2015/16 when the integration of the merger parties is expected to be complete. Indeed, we found that the operational causes of differences between water company performance in relation to contacts from customers regarding water quality and duration of supply interruptions are at least in part related to the performance of the existing water assets and local operational management, and therefore separate reporting will be likely to result in Ofwat continuing to receive data that is at least partly independent. We consider these to be mitigating factors against an adverse impact.

7.14 We found that the merger could be expected to have an adverse impact on the setting of ODI targets. However, given the mitigating factors, we were not persuaded that the adverse impact was likely to be significant (paragraphs 6.278 to 6.280).

7.15 In relation to the SIM, we found that in PR14 BW ranked highly in the SIM scores whereas SWW did not. By combining BW and SWW into a single entity, based on the static approach, we found that the merger was likely to result in the removal of a high-performing company with a resultant reduction in industry penalties of around £6 million over three years (paragraph 6.304). However, our analysis has found that there has been a considerable level of convergence in SIM scores over recent years. Taking account of expected future convergence (and allowing some time for integration of SWW and BW to take place) we expect that the merger is likely to lead to a reduction in industry penalties of £2.8 million over eight years (implying a worse outcome for customers). The sensitivity analysis that we applied showed the impact on the SIM penalties might range from a reduction of around £980,000 to £3.8 million in industry penalties for the period to 2025.

7.16 We therefore concluded that the merger could be expected to have an adverse impact regarding the SIM. However, we considered this impact to be small (paragraphs 6.307 to 6.309).

7.17 Regarding the spreading of best practice we examined whether, by reducing the number of comparators available to Ofwat (and hence potentially reducing the availability of examples of best practice upon which Ofwat can draw and/or company-specific factors that generate best practice), the merger might reduce Ofwat's ability to identify and spread best practice across the industry.

7.18 We concluded that:

- the spreading of operational best practice involves a number of methods of which the use of comparators is only one; and
- any best practice specific to small water companies will impact only a very small proportion of the overall industry.

7.19 We therefore concluded that the loss of BW as an independently owned comparator, and the consequent reduction in the number of independently owned comparators from 18 to 17, would not result in an adverse impact regarding Ofwat's ability to encourage good practice or assess qualitative aspects of submissions made by water companies during future price reviews (paragraphs 6.343 to 6.344).

7.20 On ongoing monitoring and enforcement we considered that the evidence did not relate to the impact of the loss of the merger parties as independent comparators. We therefore find that the merger would not adversely impact Ofwat's ability to monitor performance or enforce regulatory provisions (paragraph 6.345).

7.21 Overall, we concluded that the adverse impacts that we have identified in our inquiry are not significant enough, either individually or in combination, to amount to prejudice to Ofwat's ability to make comparisons between water enterprises under the Act. We therefore concluded that the merger between Pennon and BWIL has not prejudiced, and may not be expected to prejudice, the ability of Ofwat in carrying out its functions by virtue of the WIA to make comparisons between different water enterprises.