Appendix 7b:

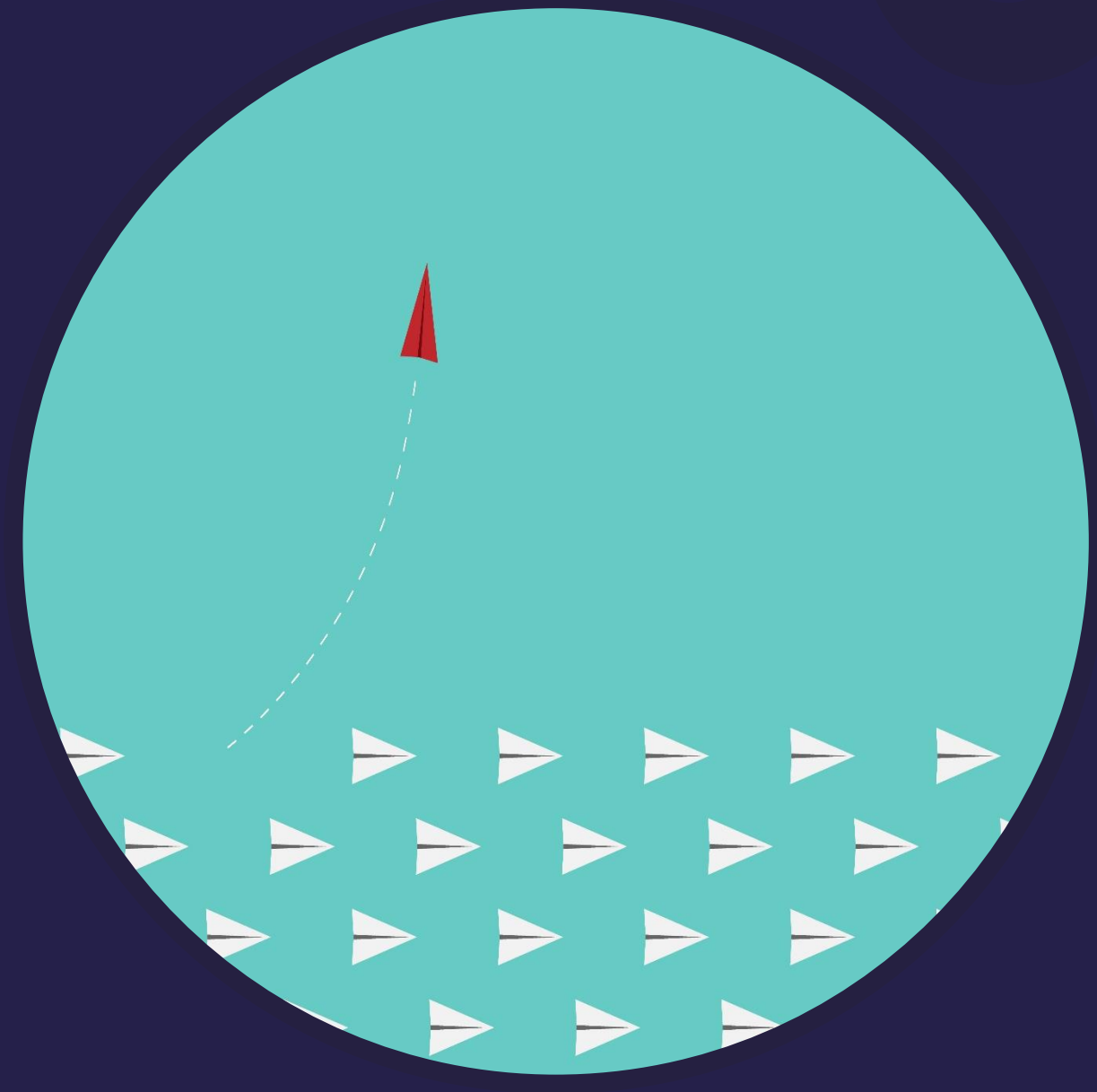
Economic Insight Cross Sector Benchmarking

YorkshireWater

Economic Insight

July 2018

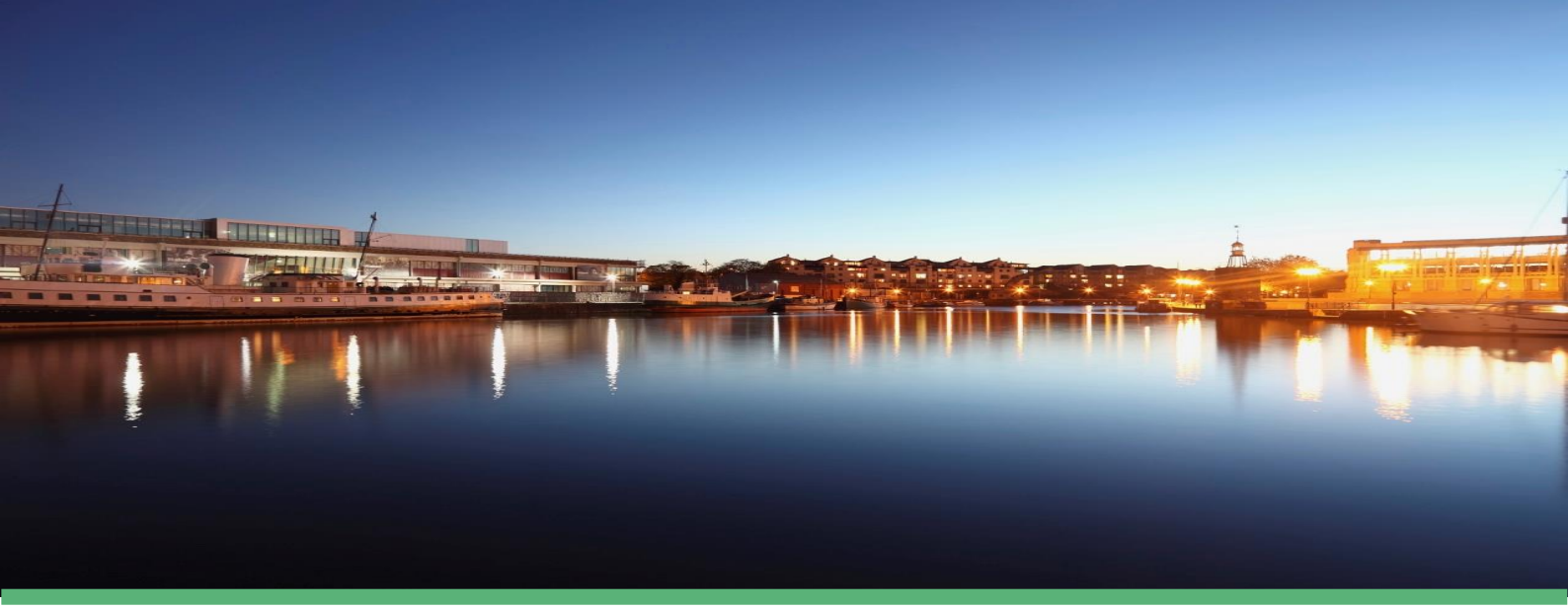
Economic Insight Ltd



CROSS-SECTOR BENCHMARKING OF BAD DEBT COSTS

A report for Yorkshire Water

CONTENTS



1. Executive summary

This report for Yorkshire Water compares its bad debt costs, as measured by bad debt charges and doubtful debt provisions, to companies within and outside of the water sector. The evidence shows that Yorkshire's bad debt costs are amongst the lowest in the water sector and are also lower than the bad debt costs of some energy and telecoms companies. Therefore, our conclusion is that any reduction in Yorkshire's bad debt costs would represent an ambitious and stretching efficient target.

1.1 Background and objectives

In its final methodology for PR19, Ofwat has stated that where possible they will aim to benchmark water companies with other sectors. Specifically, they expect companies to make a step change in cost efficiency, particularly in bad debt costs, to achieve lower bills and to help with affordability. Ofwat is expecting companies "**to look beyond their boundaries**" to achieve this.[1]

Previous analysis by Ofwat[2] shows that the total unpaid bills from customers increased from £1.9 billion to £2.2 billion between 2010/11 to 2014/15. As such, Ofwat decided that tackling bad debt and relatedly affordability is a key priority for PR19.

With this background in mind, the objectives of this research are as follows:

- To provide Yorkshire with a **better understanding of its bad debt performance** overtime.
- To compare Yorkshire's bad debt performance to other companies **within the water sector** and other companies **outside of the water sector**.

[1] *Delivering Water 2020: Out final methodology for the 2019 price review, Ofwat, December 2018*
[2] *Affordability and debt 2014-15, Ofwat, December 2015. They have defined unpaid bills as the difference between the amount billed to households but not collected during that year.*

- Finally, to reach conclusions on the scope for Yorkshire to further reduce its bad debt costs in PR19.

1.2 Overview of our approach

To conduct our analysis, we collected financial data for a total of **28 companies** across **4 sectors** spanning **7 years**. Specifically, we calculated two measures: (i) bad debt charge as a percent of revenue and (ii) doubtful debt provision as a percent of net debtors. The former measure calculates the actual cost of bad debt to companies. It is an estimate of the amount that is written-off each year. The latter measure gives us an indication of the percentage of unpaid bills that the company expects will have to be written-off in the future.

1.3 Summary of our findings

Our first main finding is that Yorkshire's bad debt charge as a percentage of revenue is second lowest in the water sector, and within the range of companies in other sectors. The same finding applies to Yorkshire's position in relation to doubtful debt provision.

Specifically, the table shows that:

- Yorkshire's bad debt charge on an adjusted basis – i.e. if it had the national average level of deprivation rather than the higher level of deprivation it has – is equivalent to 1.7% of revenue;
- the bad debt charges on an adjusted basis of other water companies are between 1.1% and 5.1% of revenue. Yorkshire is ranked 2nd lowest in the water sector;
- the bad debt charges of the energy companies in our sample are between 0.1% and 1.9% of revenue, and so the Yorkshire figure of 1.7% is within that range; and
- the bad debt charges of the telecoms companies in our sample are between 0.2% and 3.4% of revenue, and so again the Yorkshire figure of 1.7% is within that range.

Taken together, the Yorkshire figure of 1.7% is approximately halfway between the lowest bad debt charge of 0.1% and the highest bad debt charge of 3.4%.

Table 1: Comparison of bad debt charges

Sector / Company	Bad debt charge as % of revenue
Yorkshire Water	1.7%
Water	1.1% to 5.1%
Energy	0.1% to 1.9%
Telecoms	0.2% to 3.4%

Source: Economic Insight

Our second main finding is that there are several practical and conceptual challenges associated with benchmarking Yorkshire against companies from outside of the water sector.

- Data is only available for a limited number of companies. For example, there are 193 registered licensed energy companies in the UK. Relevant data is only available for 6 (<5%) of them. This creates a risk that the results are an artefact of idiosyncratic differences between a small number of firms, rather than systematic differences between sectors as a whole.

- Different companies will serve different customers with different (uncontrollable) bad debt risks associated with them. We have taken account of some of these differences in our analysis, but it is not possible to take account of them all with the data available.

- Data is available on bad debt charges, but not on debt management costs – the other part of total bad debt costs. Other things equal, we would expect that lower bad debt charges will be associated with higher debt management costs. The implication is that any differences between companies / sectors in terms of bad debt charges are likely to *overstate* the differences between companies / sectors in terms of total bad debt costs.

- Companies have some discretion about how they record bad debt costs in their accounts and so some differences between companies may arise due to this, rather than differences in their underlying bad debt costs.

- More generally, different companies will likely adopt different business models that could result in different bad debt charges for the same level of underlying cost efficiency.

Indeed, the data shows that median or average bad debt charge figures mask significant variation in bad debt charges (and indeed doubtful debt provision) within each sector. For example, the lowest bad debt charge amongst energy companies in our sample is 0.1% of revenue and the highest is 19 times higher at 1.9% of revenue. This strongly suggests that other factors (such as those set out above), in addition to or instead of the underlying relative competitiveness and therefore systematic differences in the efficiency of each sector, explain some of the differences between companies' bad debt charges.

1.4 Our conclusions

Based on the two findings set out above, our conclusions are as follows.

- First, any attempt by Yorkshire to reduce its bad debt costs would represent an ambitious and stretching efficiency target. This is because its bad debt costs are:
  - lower than all but one other water company; and
  - lower than several companies in other sectors.
- Second, such an attempt may require Yorkshire to make dynamic / frontier shifting (rather than catch-up) efficiency gains. This is for the reasons set out above, and also because the opportunity for Yorkshire to cut its costs by catching-up to the "median" company in other sectors is lower than the opportunity that other companies with higher bad debt costs may have.
- Third, our recommendation is that Yorkshire should attach more weight to within-sector benchmarking evidence than the cross-sector benchmarking evidence in order to arrive at an efficiency target. This is because of the practical and conceptual challenges set out above.

1.5 Structure of this report

The rest of the report is structured as follows:

- **Chapter 2** provides the context and aims of our research.
- **Chapter 3** sets out our sources of data, descriptive statistics and a discussion on the comparability of sectors.
- **Chapter 4** summarises our findings of the bad debt charge measure.
- **Chapter 5** summarises our findings of the doubtful debt provision measure.
- **The annexes to this report** contain: (a) our methodology for the IMD adjustments; (b) further graphical analyses of the data we have collected; and (c) a full list of companies and years covered by our analysis.

2. Introduction

2.1 Context and aims

In PR14, Ofwat for the first time set separate price controls for the retail and wholesale services. These separate controls provided greater insight into the key drivers of costs. In particular, it found that bad debt accounts for a significant proportion of retail costs. Increases in bad debt leads to higher bills for customers that pay to cover the shortfall, while it also makes it harder for customers that are already struggling to pay. Since it has an impact on many different parts of customer service, Ofwat decided to focus on this for PR19.

Accordingly, Ofwat commissioned PwC[3] in 2017, to provide an understanding of how the water sector compares to other sectors.

Our work aims to extend and improve upon PwC's analysis by:

- using a larger dataset – we have two additional years of data and 3 more companies are examined;
- we adjust for deprivation as different retailers have different socio-demographic mix of customers; and
- we draw out the implications of Yorkshire's relative position in the water sector and in other sectors.

[3] *Retail services efficiency benchmarking, PwC, report for Ofwat, September 2017.*

2.2 Performance measures

We use the following two performance measures to investigate Yorkshire's bad debt performance.

$$\mathbf{1)}\ \boldsymbol{Bad\ debt\ charge}\ (\%\ \boldsymbol{of\ revenue}) = \frac{bad\ debt\ charge}{revenue} \times 100$$

Bad debt charge[4] is the charge made to the income statement to account for customer debts which are not collectable. It is sometimes thought of as the amount of debt that is written off each year.

$$\mathbf{2)}\ \boldsymbol{Doubtful\ debt}\ (\%\ \boldsymbol{of\ net\ debtors}) = \frac{provision\ for\ doubtful\ debt}{net\ trade\ debtors} \times 100$$

Doubtful debt provision is the amount of debt that the company believes to be uncollectable. It is estimated by the historical rate of payment for a certain age of debt.

Note that different provisioning policies and calculations are applied by different companies. Since there's no standard calculation method across companies, we believe this measure is less reliable for comparison purposes than the bad debt charge.

[4] *Bad debt charge is referred to as doubtful debts in the regulatory accounts. Note that it is a component of bad debt costs:*
$bad\ debt\ costs = bad\ debt\ charge + debt\ management\ costs$

3. Sectors and sources

This section provides an overview of the data used, an evaluation of the comparability between sectors and key considerations of this analysis.

3.1 Data sources

In benchmarking bad debt costs across sectors, we drew on the following data sources.

Data was collected for 4 sectors, across 7 years.

- We collected data from firms in the water, energy and telecommunications sectors, as well as for council tax collection rates, over the period 2010/11 to 2016/17 (7 years).
- Data was collected on an annual basis per company for the following variables: revenue, trade receivables (net), bad debt charge, and provision for doubtful debts. Any missing observations have been interpolated using either the closest year or the average of the two adjacent years.
- The data for the water sector has been sourced predominantly from the Regulatory Accounts, with the addition of the doubtful debt provision collected from the Statutory Accounts. Data for both the energy and telecommunications sectors has been sourced from companies' annual reports. Where the relevant subsidiary did not report on the variables required, the parent company's accounts were instead used. Council tax collection rates have been sourced from the Office of National Statistics.
- We obtained data on IMD from the ONS for England and from the Welsh Government's website for Wales. The two datasets can be merged because in both cases, the IMD score represents the proportion of the population that is considered to be income deprived.[5]

[5] *We note that there are several measures of regional socio-economic conditions that have been used by companies and regulators in the context of cost assessment. We have used IMD here given that it is well-understood through its prevalence in cost assessment both at PR14 and PR19.*

3.2 Sample size

The following table details the sample size used in our analysis. The choice of companies included in the analysis has been determined by data availability. According to Ofgem, there are 193 companies in the UK with a license to supply energy. The vast majority of these companies were either dormant, small or recently incorporated. We could not include small companies because certain financial information is not publicly accessible. Further, since we needed at least 7 years of data, for a fair comparison with other industries, we had to exclude companies that were incorporated recently. The list had to be further filtered because companies are not obliged to publish data on bad debt charge and doubtful debt provision which are key components of our performance measures. This left us with a total of 6 energy companies out of the 193.

Note that the data published by the Office of National Statistics regarding council tax collection rates does not include data for the provision for bad debts. As such, council tax collection rates were only included in our cross-sector analysis of bad debt as a % of revenue.

Table 2: Sample size

Sector	Water	Energy	Telecoms	Council Tax collection rates (Bad debt only)
Number of companies	17	6	7	1
Years	7	7	7	7
Total observations	126	21	56	7

Source: Economic Insight

The average of each metric per sector was then calculated to allow for comparison. These figures were subsequently adjusted to control for regional variation in deprivation using the index of multiple deprivation (IMD). Details of the methodology used to make these adjustments are included in Annex A.

3.3 Descriptive statistics

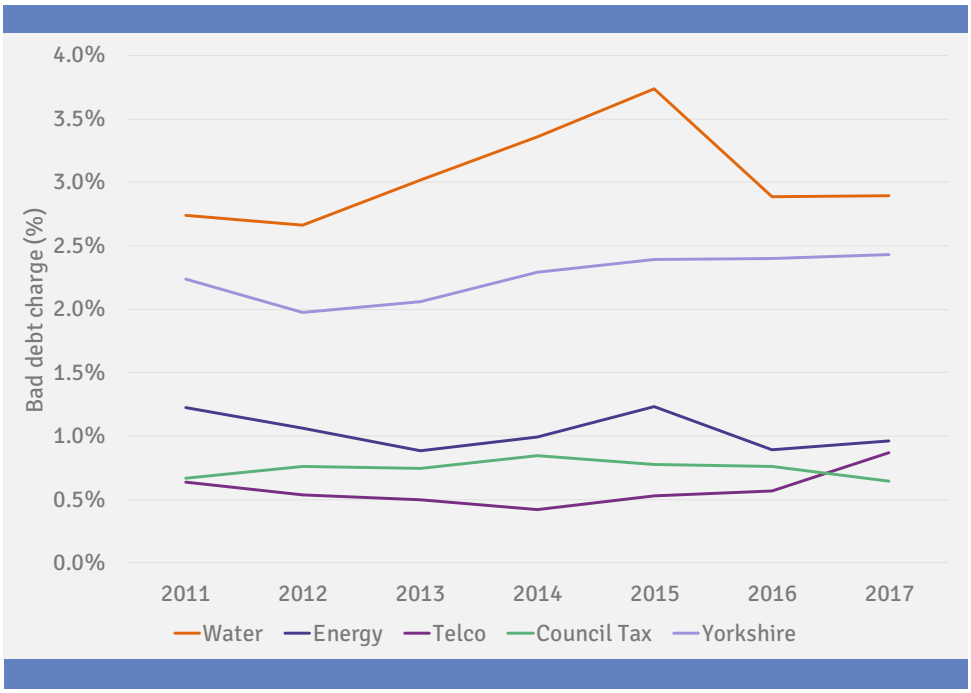
Bad debt measures are sensitive to economic conditions. During times of recession, there are likely to be more customers that are unable to pay their bills on time or at all.

Figure 1 illustrates the movement of bad debt charge over time. The figure shows that:

- Yorkshire Water has had a relatively stable bad debt charge, ranging between **2.0%** to **2.4%;**
- Yorkshire has consistently lower bad debt charges than the median water company, which has increased from **2.7%** to **3.7%**; and
- the median water company bad debt charge is higher than the median bad debt charge amongst the other (non-water) companies included in our sample.

See Annex B for further analysis.

Figure 1: Median bad debt charge over time by sector



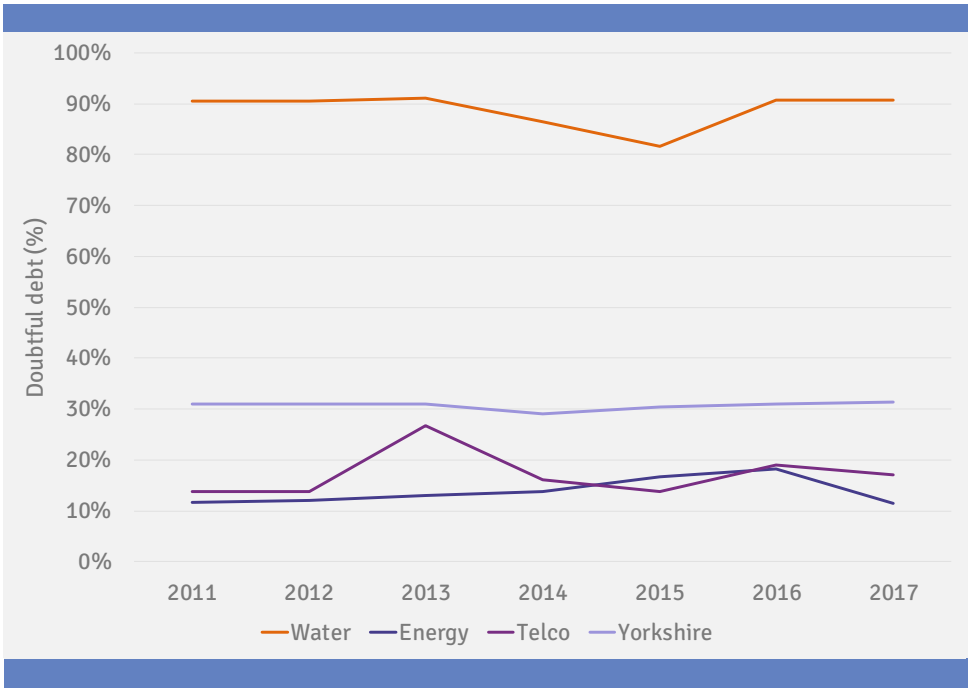
Source: Economic Insight

Figure 2 illustrates doubtful debt performance by sector over time. The figure shows that:

- Yorkshire Water has a maximum doubtful debt provision of **31.4%** in 2015;
- again, it is consistently lower than the median water company, which has increased from **70%** to **86%**; and
- the median water company doubtful debt provision is higher than the median doubtful debt provision amongst the other (non-water) companies included in our sample.

See Annex B for further analysis.

Figure 2: Median doubtful debt charge over time



Source: Economic Insight

3.4 Comparability of sectors

Our choice of sectors to include in the analysis were driven by a number of factors, namely:

- ***Data availability***: there is no requirement for firms to report on their bad and doubtful debt costs, which limited the number of companies for which data could be obtained,

- ***Comparability***: the sectors included in the analysis must share similar characteristics with regards their propensity to incur bad and doubtful debt, in order for any differences between them to be attributed to differences in efficiency.

As a result of the above factors, our final dataset comprised companies in the energy and telecommunications sectors, along with local authorities. A discussion of their comparability with the water sector regarding bad and doubtful debt is presented below.

3.4.1 Similarities between sectors

One prominent similarity between the sectors included in our analysis is that payment is collected ***after*** providing a service, but ***not at the point of service***.

This latter point is particularly important because firms considered in our analysis have both a physical distance from their customers as well as a significant time period between consumption and payment to contend with. As a result, these firms are more susceptible to providing a service that they may not be remunerated for, compared to service providers who receive payments prior to supply of goods or services, for example retailers; or after consumption, but at the point of service, for example, restaurants. The close proximity to customers and the immediacy of required payment gives these types of provider a greater ability to recover the payment for their services, resulting in a lower default rate.

Including sectors which share characteristics that affect the propensity to incur bad debt costs is important to allow any differences between sectors to reflect differences in efficiency, and not differences in the nature of service provision.

Another similarity stems from the way in which consumers view these sectors. Our small scale consumer satisfaction survey conducted in 2017, showed that when considering their satisfaction of water and energy providers, consumers are more likely to draw comparisons with other utility providers such as telecoms and broadband providers but to a lesser extent, local authorities, in order to inform this decision.[6] This signals that consumers view the services provided by these companies as similar, and therefore may adopt similar attitudes and behaviours to paying for the services provided by them.

[6] *Consumer satisfaction survey for Utility Week Congress, Economic Insight, October 2017*

3.4.2 Differences between sectors

Despite these similarities, there are a number of differences between the sectors that may affect the propensity to incur bad and doubtful debt, and thus ought to be considered when making comparisons between them.

- First, the strength of the incentive to pay outstanding bills differs across sectors. Unlike water companies, who were legally prohibited from cutting off supply to customers in 1999, both energy and telecommunications are permitted to cut off their services to customers that default on their payments. This threat of cut off is likely to provide a stronger incentive to keep up with timely payments. Even greater incentives exist for the payment of council tax, since non-payment is a criminal offence and can result in a fine, or even imprisonment.

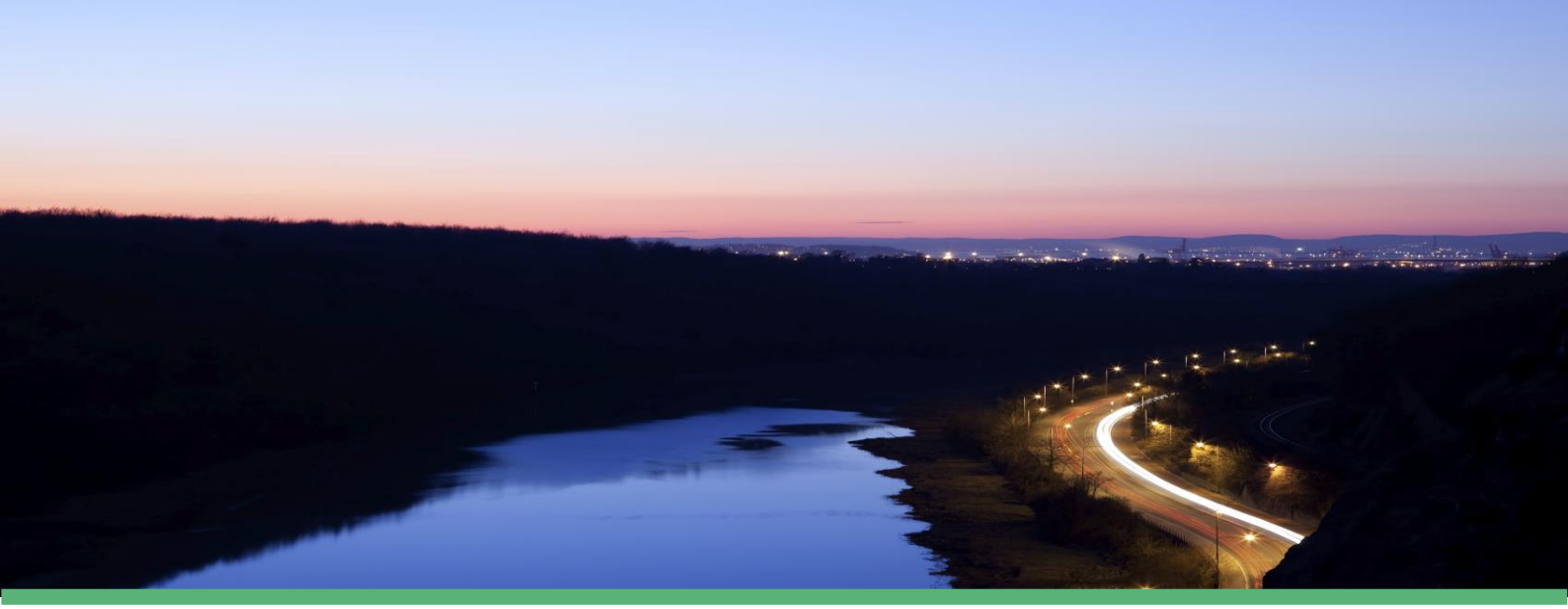
- Second, water companies operate on a regional basis, and as such, bad and doubtful debt levels are influenced by the level of deprivation in the region that they serve. Those serving a particularly deprived area would be likely to serve a greater proportion of customers at higher risk of default, while those operating in relatively prosperous areas would be expected to incur a lower level of bad and doubtful debts. Energy and telecommunications companies on the other hand are not constrained to a particular geographic region, and are therefore more likely to have a customer base representative of the national population.

- Third, differences in bad debt costs between sectors may arise from differences in the customer mix served. For example, commercial customers may be more likely to systematically pay outstanding bills, and are therefore less likely to default when compared to residential customers. This analysis compares the residential retail water sector, which serves only household customers, with sectors that serve a mixture of both household and non-household customers. It is therefore possible that a portion of the difference in bad debt costs between the water sector and others is a result of comparing sectors with a different customer mix.

- Fourth, data is available on bad debt charges, but not on debt management costs - the other part of total bad debt costs. Other things equal, we would expect that lower bad debt charges will be associated with higher debt management costs. The implication is that any differences between companies / sectors in terms of bad debt charges are likely to overstate the differences between companies / sectors in terms of total bad debt costs.

3.4.3 What does this mean for comparability?

As discussed above, although there are several similarities between sectors included in the analysis, there are also inherent differences. These differences are likely to affect the level of bad debt reported across sectors, and are also outside of management control. As a result, it is important to bear in mind that differences between the bad debt level seen across these sectors are unlikely to be wholly attributable to differences in their competitiveness and efficiency.



4. Bad debt charge analysis

This chapter sets out our results from the cross-sector benchmarking of bad debt charge. Our results show that the water industry on average spends the largest amount on bad debt charge. However, we see that the spread is quite wide within the water industry. That is, there are some companies in the water sector that are achieving the same level of bad debt charge as companies in other sectors. We find that Yorkshire's bad debt charge performance is within the upper quartile in the water sector.

4.1 Definition

The bad debt charge is the addition made to doubtful debt provision each year. It is sometimes thought of as the amount of debt that is written off each year.

In the following section, we explain why we need to adjust this measure for regional differences in deprivation and then go on to make comparisons with the data.

Yorkshire has an above average level of deprivation, which is likely to impact their bad debt measures.

4.2 Adjusting for deprivation

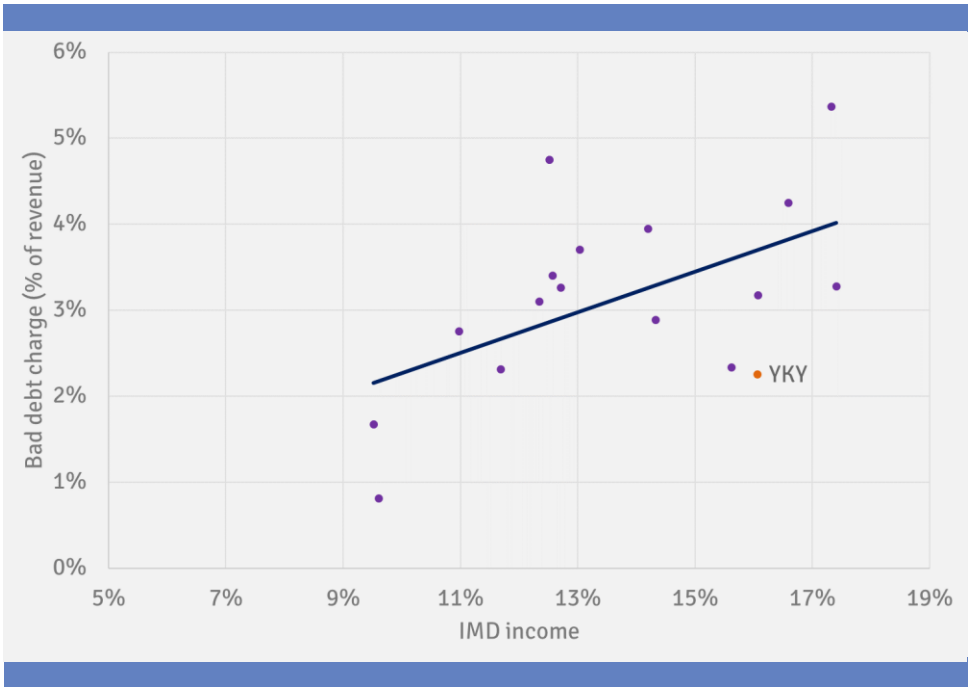
The regional level of deprivation is likely to have a significant impact on bad debt costs. This is because customers that live in regions with poorer socioeconomic indicators are more likely to default or fall into arrears. Figure 3 shows that companies that serve in regions with high deprivation tend to have high bad debt costs. In particular, the chart shows that Yorkshire has an above average level of deprivation.

As regional differences in deprivation can have an impact on bad debt measures, we adjust for deprivation to ensure that like-for-like comparison is made between sectors.

The household **water** retail sector can only serve customers within a region, whereas (most) other companies in our sample can serve customers nationally. Therefore, since the water sector is a regional service we have made an adjustment for differences in the levels of deprivation. Details on the methodology behind this adjustment can be found in Annex A.

We have not done this for the energy sector because many of the companies operate in multiple regions with different levels of deprivation. For instance, SSE are the incumbent energy suppliers in the South of England, South Wales and in North Scotland.

Figure 3: Scatter plot between IMD and bad debt costs



Source: Economic Insight

4.3 Aggregate sector comparison

The following table summarises the median bad debt charge by sector. At the aggregate level, we find that water companies spend a greater proportion of their total revenue on bad debt charge compared to some other companies included in our sample. The telecoms companies in our sample appear to spend the least on bad debt charge.

Table 3: Median bad debt charge by sector (% of revenue)

Water	Water (IMD adj.)	Yorkshire (IMD adj.)	Energy	Telco	Council Tax
3.2%	3.0%[7]	1.7%	1.2%	0.5%	0.8%

Source: Economic Insight

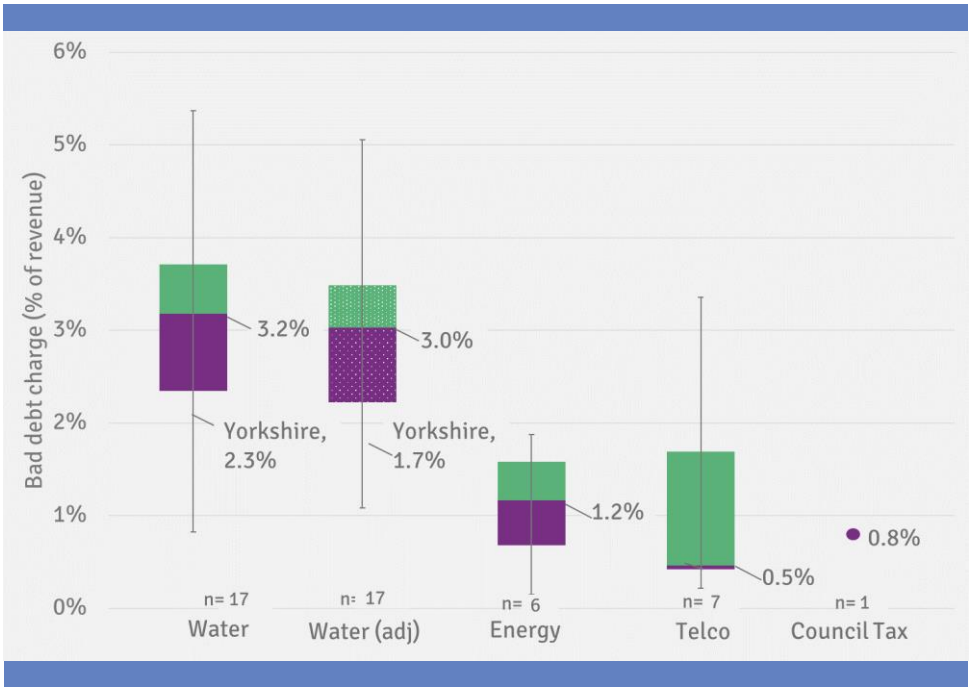
[7] *The figure is 3.0% rather than 3.2% because the median company / figure changes when the adjustment is made.*

However, looking at this more closely, Figure 4 plots the bad debt charge range across each of these sectors. The chart shows that there is a wide range within the water sector. Yorkshire's bad debt charge performance is within the upper quartile of all companies. On average, Yorkshire spends **2.3%** of its revenue on bad debt charge, this is better than the median sector performance of **3.2%.** As seen in Figure 3, since Yorkshire is more deprived than the national average, we deflate this figure to reflect its cost if it had the national average deprivation level. This reduces Yorkshire's bad debt charge from **2.3**% to **1.7**%.

The figure also shows that there are some water companies that perform at least as well or better than some companies in the other sectors. For example, Yorkshire performs better than at least one energy and one telecoms company.

Figure 4 also shows that, even within the same sector, the bad debt charge range is quite large. This may be down to the inherent trade-off between debt management costs and bad debt charge, since the more the company spends on recovering unpaid bills now, the less it will have to write-off in the future. It could also be explained by the other factors set out earlier in this report.

Figure 4: Box plot of bad debt charge by sector

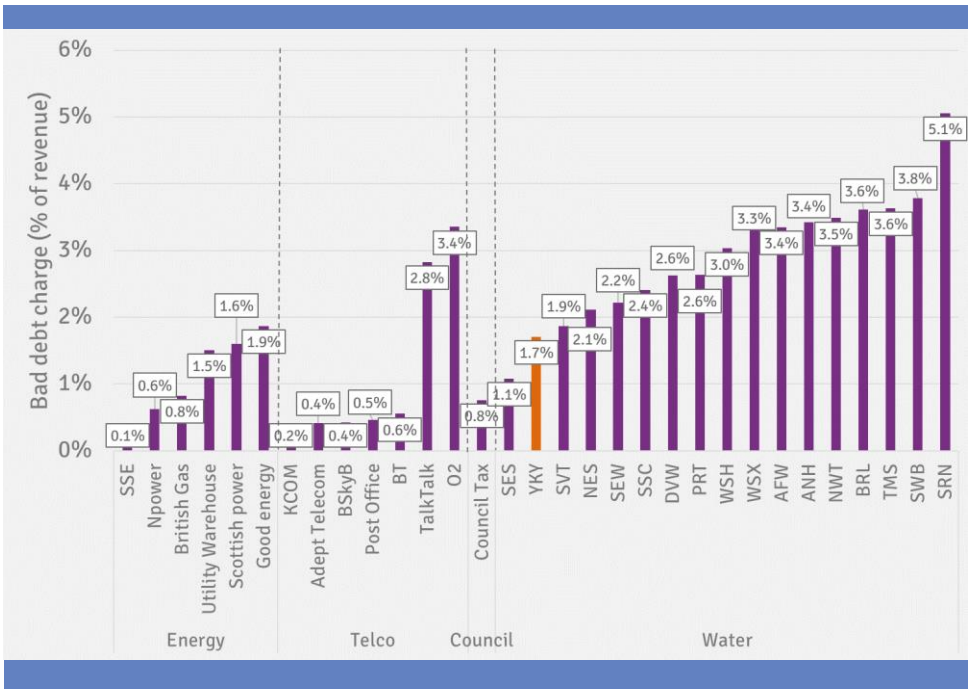


Source: Economic Insight

4.4 Yorkshire's relative position to other companies

In the following figure, we compare Yorkshire's performance to all other companies in our dataset. We find that within the water sector, Yorkshire is ranked **second**. It also illustrates that: (a) Yorkshire performs better than 1 energy company and 2 telco companies; and (b) that its bad debt charge of 1.7% is within the range of the bad debt charges in the other sectors (from 0.1% for SSE to 3.4% for O2).

Figure 5: Comparison with all sectors



Source: Economic Insight

4.5 Conclusion

The data set out in this section shows that Yorkshire Water's bad debt charge is at or above the upper quartile in the water sector, and within the range of companies in other sectors. Therefore, we conclude that on this metric, any reduction in Yorkshire's bad debt costs would represent an ambitious and stretching efficiency target.

5. Doubtful debts provision analysis

In this chapter we compare doubtful debts provision across sectors. We find that Yorkshire Water is the most efficient company within the water sector and its performance is similar to companies in other sectors, notably telecoms.

5.1 Definition

The provision for doubtful debt is the proportion of net trade receivables that the company believes is uncollectable. This is normally estimated based on previous experience. Usually, the older the debt gets, the less likely it is to recover it.

Trade receivables is the sum of unpaid bills for any given year. From our bad debt charge analysis, we know that eventually, 3.2% of receivables are written off. This in turn implies that companies are able to recover 96.8% of bills. That is, by trade receivables, we are looking at any bills that have not been paid in the year that it was billed. In our calculations, we use **net** trade receivables, which is trade receivables minus provision for doubtful debt to delineate between provisions and receivables.

Our analysis shows that firms are generally able to recover 96.8% of bills.

5.2 Aggregate sector comparison

Table 4 shows that the water sector has the largest provision for doubtful debt. The median company expects that **94.4%** of its debtors is unrecoverable. The lowest doubtful debts provision is in the energy sector.

Table 4: Median doubtful debt provision (% of net debtors)

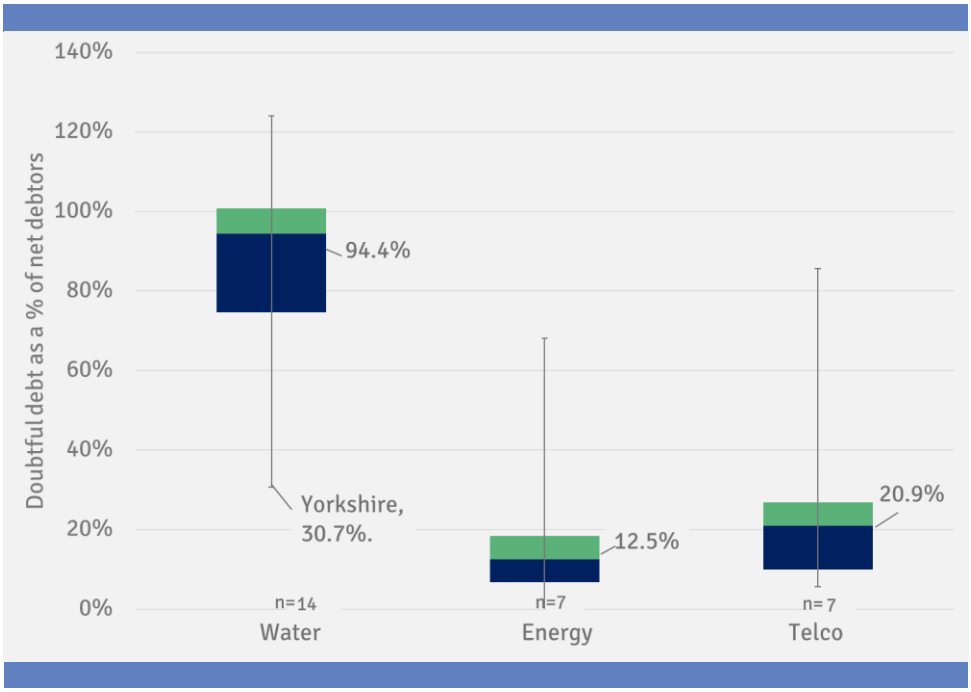
Yorkshire	Water	Energy	Telecoms
30.7%	94.4%	12.5%	23.6%

Source: Economic Insight

A closer inspection of the data shows that the range is widest in the water sector. with the best performing company at **31%** and the worst performing company at **124%**.

Note that there is some overlap between the water and telecoms sector. We see that, Yorkshire is the frontier company (31%) in the water sector.

Figure 6: Box plot of doubtful debt by sector

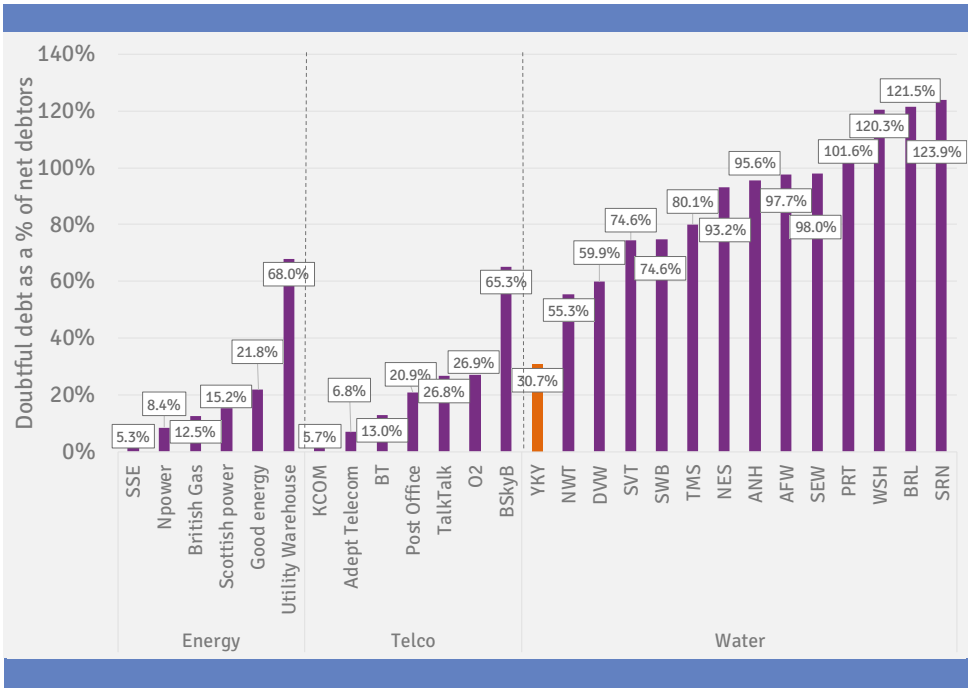


Source: Economic Insight

5.3 Yorkshire's relative position to other companies

Here we compare Yorkshire's performance to companies in other sectors.[8] Figure 7 shows us that Yorkshire's doubtful debt figure of 30.7% is within range of the doubtful debt figure in the other sectors of 5.3% to 85.6%.

Figure 7: Yorkshire's doubtful debt provision relative to energy and telecoms companies

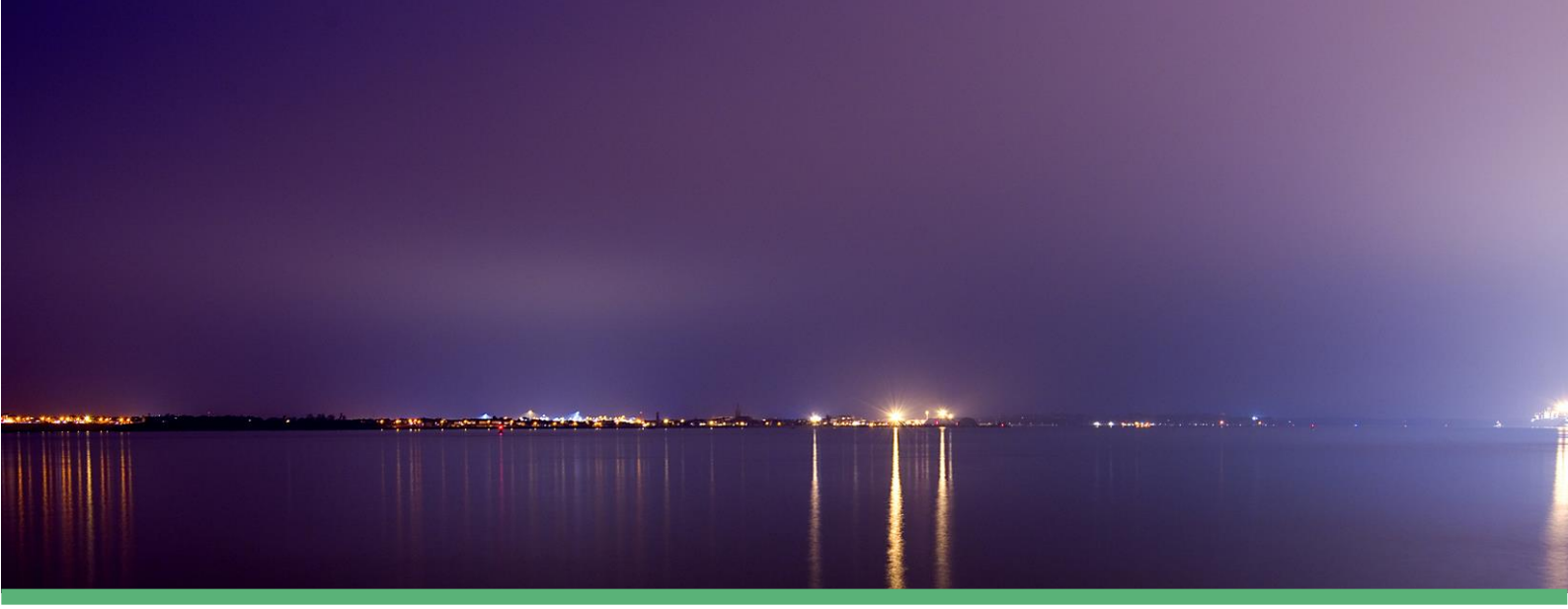


Source: Economic Insight

5.4 Conclusion

Consistent with the data relating to bad debt charges, the data set out in this section shows that Yorkshire Water's doubtful debt provision is at or above the upper quartile in the water sector, and within the range of companies in other sectors. Therefore, we conclude that on this metric, any reduction in Yorkshire's bad debt costs would represent an ambitious and stretching efficiency target.

[8] *Note that we have not adjusted this measure for IMD because this metric is a ratio of two variables where both the numerator and the denominator are like to be affected by the deprivation level in equal proportion. As such, this measure is not biased by the regional differences in deprivation.*



6. Annex A – Deprivation differences

In this section we explain our methodology for adjusting Yorkshire's bad debt charge for differences in the levels of regional deprivation.

Water is a regional service and as such to some extent bad debt charge of a water company is reflective of the levels of deprivation in that region. Figure 3 showed that there is a strong correlation between IMD and bad debt charge. The figure also showed that Yorkshire is more deprived than the average company. In Yorkshire **16.1%** of residents are categorised as deprived due to low income[9] while the average in England and Wales is **13.3%.**

The water retail sector is a **regional** vertically integrated service while telecoms and energy are largely **national** services. Similarly, the local authority data that we obtained is also recorded at the **national** level. Hence, to ensure that a like-for-like comparison is made between sectors, we need to make an adjustment for IMD. Essentially, as shown in Figure 8, we are moving from point A to point B.

Below we list out the steps implemented in making these adjustments.

- We first obtain the difference between Yorkshire's IMD and the average IMD in UK. The gap is **2.8** percentage points[10].
- Using econometrics, we calculate that the elasticity between IMD and bad debt charge (% of revenue) to be **8.6%.**
- Bringing this together, we find that if Yorkshire's deprivation was the same as the national average then it's bad debt charge would be **24.2%** less (2.8*8.6%).

[9] IMD income score can be interpreted as the percentage of the population that have low earnings. These individuals are in receipt of either income support, job seeker's allowance, employment and support allowance or pension credit.
[10] The difference between Yorkshire's deprivation and the England and Wales average is 16.1% - 13.3%.

Figure 8: Scatterplot of IMD and bad debt charge

Source: Economic Insight

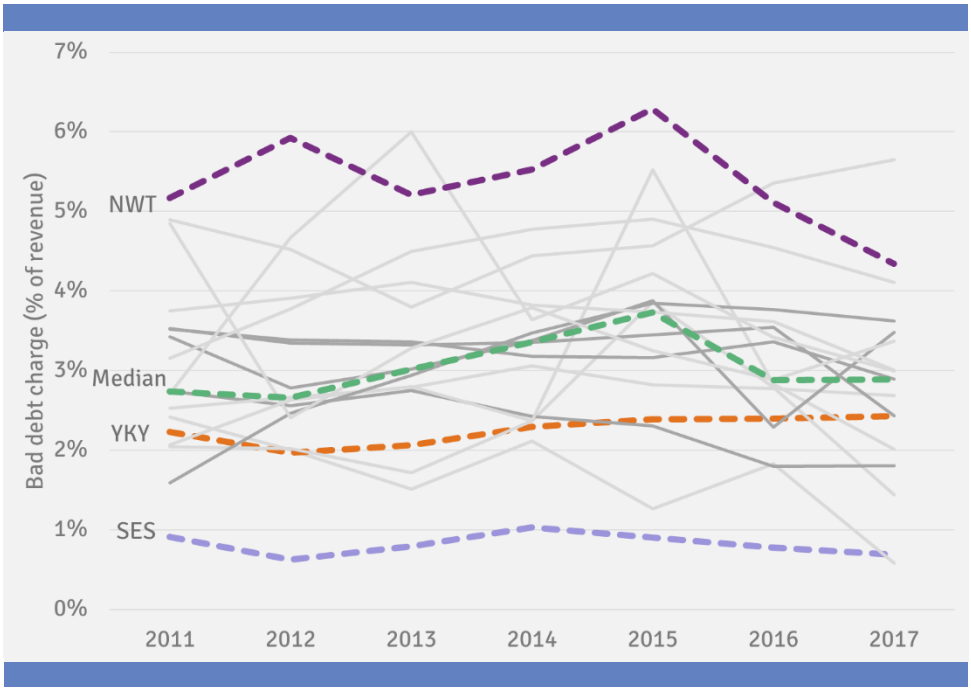
7. Annex B – Graphical analyses

In this section we set out our graphical analyses of bad debt charges and doubtful debts by sector.

7.1 Bad debt charges

The figure below shows the bad debt charge as a percentage of revenue for the 18 water companies, over 2011-2017. As can be seen, there is a wide variation in the size of the bad debt charge compared to revenue, with Northumbrian Water (NWT) commanding a debt charge of **5.4%** of revenue on average over the period, while Sutton and East Surrey Water (SES) average **0.8%.** Yorkshire Water remains firmly above the median performer across the period, with bad debt charge as a percentage of revenue averaging **2.3%**.

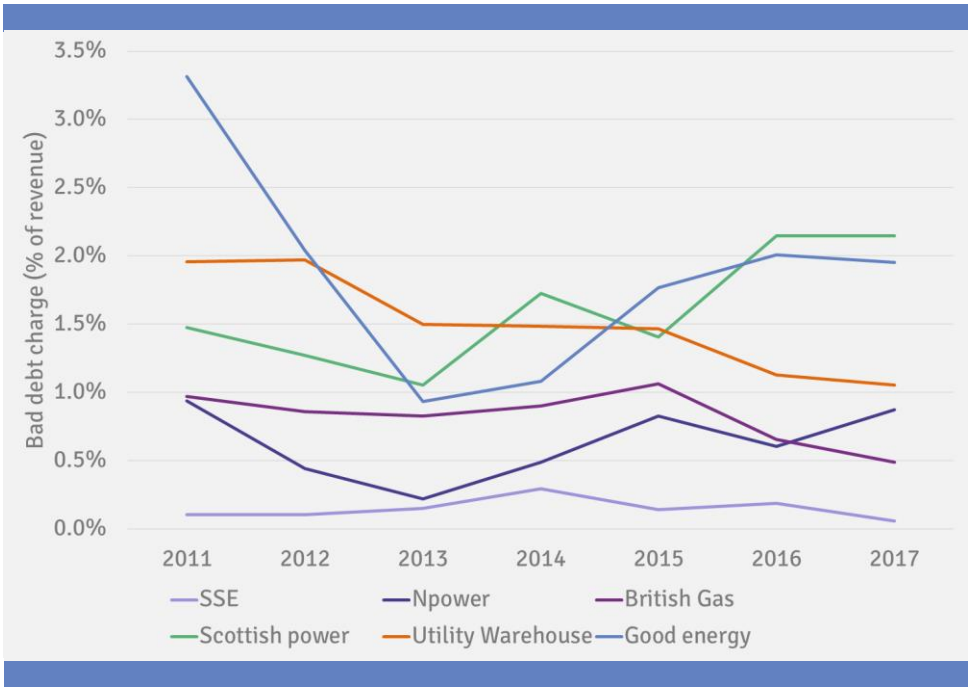
Figure 9: Bad debt charge in the water sector



Source: Economic Insight

The figure below charts the bad debt charge as a percentage of revenue for firms in the energy sector. Good Energy's bad debt charge fluctuates significantly over the period, ranging from **3.3%** to **0.9%.** Other firms experience less variation in bad debt as a proportion of revenue, and overall there is less variance compared to the water sector.

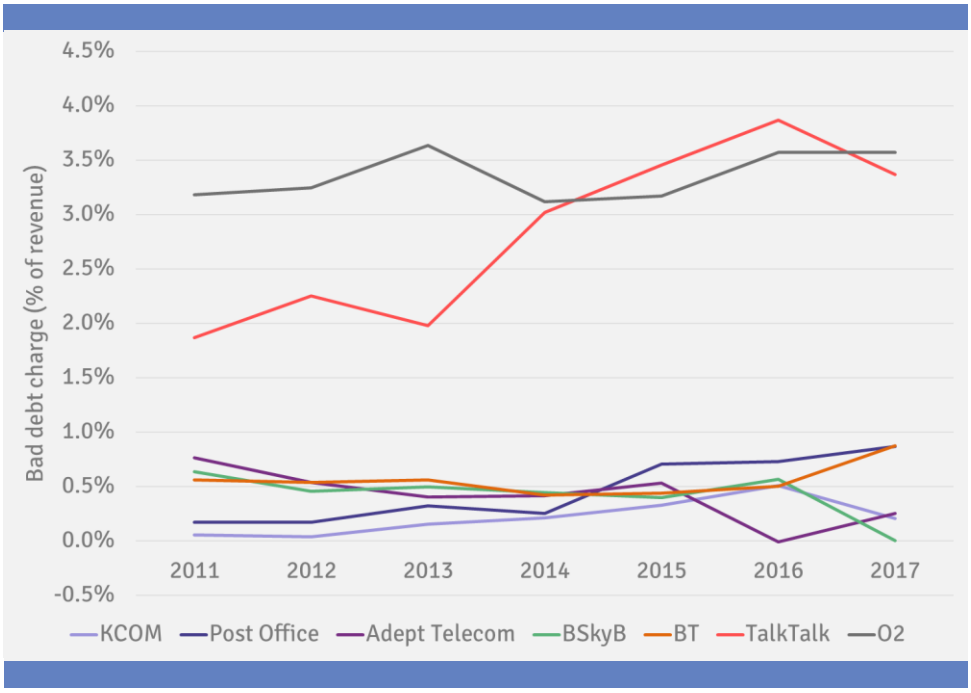
Figure 10: Bad debt charge in the energy sector



Source: Economic Insight

The figure overleaf tracks bad debt as a proportion of revenue over 2011-2012 for the telecommunications sector. Both TalkTalk and O2 have far higher bad debt charge over revenue compared to other firms analysed in the sector. Generally, we can see an upward trend in bad debt charge as a proportion of revenue for this sector.

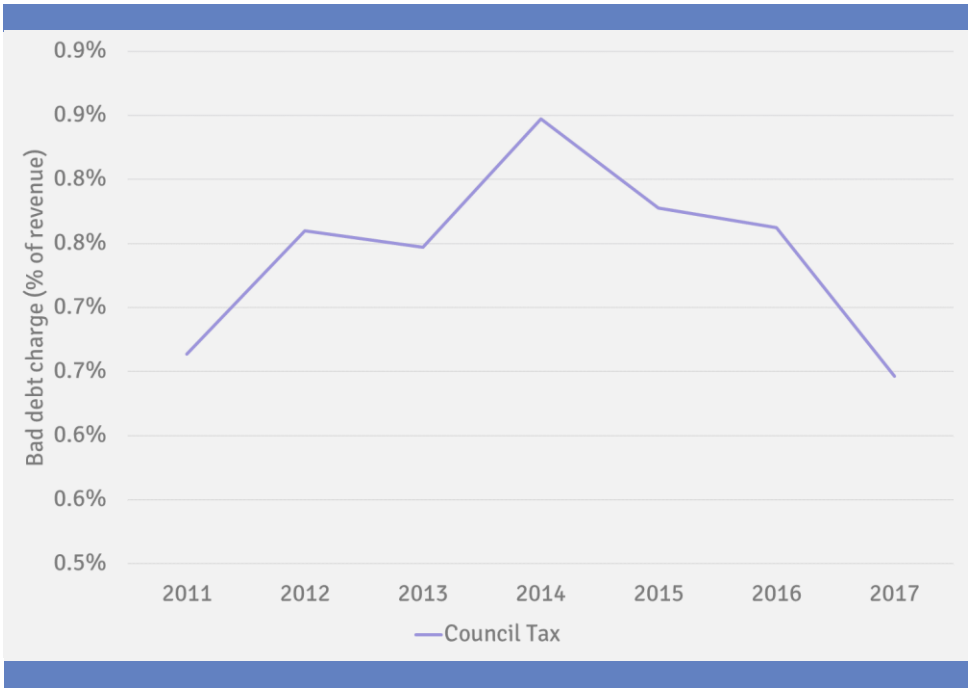
Figure 11: Bad debt charge in the telecoms sector



Source: Economic Insight

Bad debt as a proportion of revenue for Local Authorities, regarding the collection of Council Tax, spiked in 2014 at **0.85%.** By the end of the period, it had fallen to its lowest level, to just under **0.65%.**

Figure 12: Bad debt charge in Council Tax

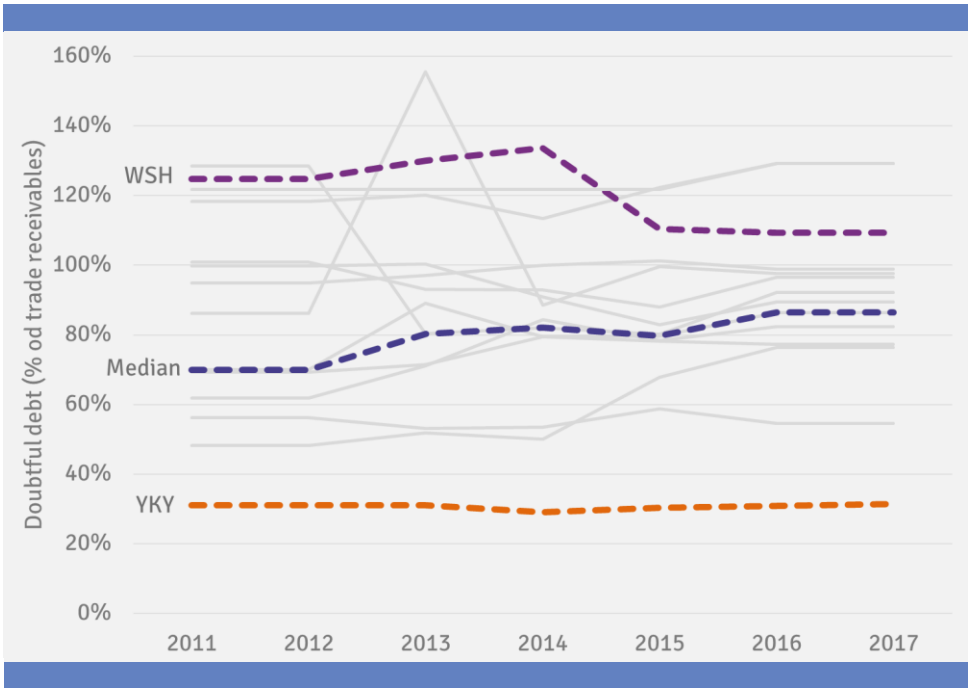


Source: Economic Insight

7.2 Doubtful debts

Below shows doubtful debt as a proportion of trade receivables for firms in the water sector, over 2011-2017. Similarly to the bad debt charge, there is a wide variation in the level of doubtful debt over the period across water companies. As shown, Yorkshire Water is the clear frontrunner across the period.

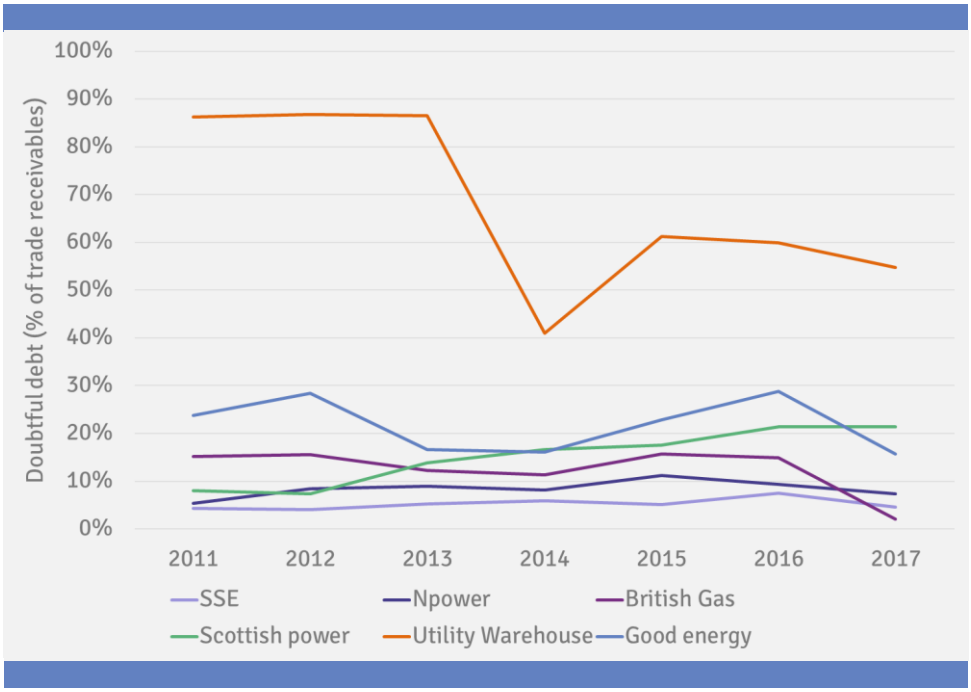
Figure 13: Doubtful debt provision in the water sector



Source: Economic Insight

In the energy sector, the level of doubtful debt as a percentage of trade receivables ranges between **2%-30%** over 2011-2017, as shown on the chart overleaf. However, Utility Warehouse is a clear outlier, with a doubtful debt level averaging **68%** across the period.

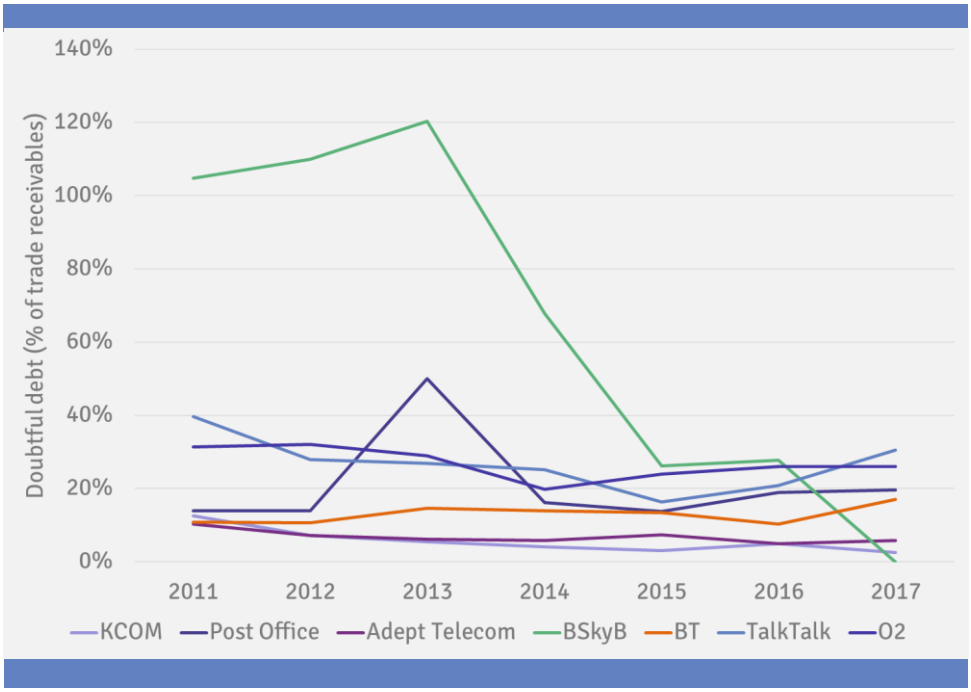
Figure 14: Doubtful debt provision in the energy sector



Source: Economic Insight

In the telecommunications sector, the doubtful debt level for both the Post Office and BSkyB peak in 2013, at **50%** and **120%** respectively. For the other firms included in the analysis, the level of doubtful debt is more stable across the period, and ranges between **2%-40%.** This is shown in the chart below.

Figure 15: Doubtful debt provision in the telecoms sector



Source: Economic Insight

8. Annex C – Sources

In this section, we detail the data sources used.

8.1 Energy sector

The table below details the data sources used for the energy sector. A total of 6 firms were used in our analysis.

Parent company	Relevant subsidiary	Data used	Time-period
Centrica	British Gas Trading Ltd	Parent	2011-2017
Good Energy Group plc	Good Energy Ltd	Parent	2011-2017
Iberdola	Scottishpower energy retail Ltd	Subsidiary	2011-2016
Telecom Plus plc	Utility Warehouse	Parent	2011-2017
RWE AG	NPower	Parent	2011-2017
SSE plc	SSE Energy Supply Ltd	Parent	2011-2017

8.2 Telecommunications sector

The table below shows that data was sourced from 7 firms in order to analyse the telecommunications sector.

Parent company	Relevant subsidiary	Data used	Time-period
KCOM Group Plc	KCOM Group plc	Parent	2011-2017
TalkTalk Telecom Group plc	TalkTalk Telecom Group plc	Parent	2011-2017
BT Group plc	BT plc	Subsidiary	2011-2017
Telefonica	Telefonica UK Ltd	Subsidiary	2011-2016
Sky plc	British Sky Broadcasting Group plc	Subsidiary	2011-2016
Adept Telecom plc	Adept Telecom plc	Parent	2011-2017
Royal Mail Group	Post Office Ltd	Subsidiary	2012-2017

8.3 Council tax

Data for council tax collection rates was sourced from the Department for Communities and Local Government through the Office for National Statistics, for the time-period 2011-2017.

8.4 Water sector

The table below details the water companies for which data was collected, and the corresponding time-period. Missing observations over the period 2011-2017 have been interpolated using either the closest year or the average of the two adjacent years.

Company	Time-period
Affinity Water	2011-2017
Bristol Water	2011-2017
Dee Valley Water	2011-2017
Bournemouth Water	2011-2016
Sutton and East Surrey Water	2011-2017
South Staffs Water	2011-2017
Portsmouth Water plc	2011-2017
South East Water	2011-2017
Anglian Water	2011-2017
Northumbrian Water	2011-2017
Southern Water	2011-2017
Severn Trent Water	2011-2017
South West Water	2011-2017
Thames Valley Water	2011-2017
United Utilities	2011-2017
Wessex Water	2011-2017
Welsh Water	2011-2017
Yorkshire Water	2011-2017

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