



ECONOMIC
CONSULTING
ASSOCIATES

**Update to our
Recommendations for the
Cost of Capital 2020-2025**

Final Report

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**Submitted to the Consumer
Council for Water by:**

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Abbreviations and acronyms

APR	Annual performance report
CAA	Civil Aviation Authority
CAPM	Capital Asset Pricing Model
CCWater	Consumer Council for Water
CMA	Competition and Markets Authority
CPI	Consumer price index
CPIH	Consumer price index including owner-occupiers' housing costs
DDM	Dividend discount model
DMS	Dimson, Marsh and Staunton
ECA	Economic Consulting Associates
ERP	Equity risk premium (also known as the Market risk premium)
EV	Enterprise value
E&W	England and Wales
FTSE	Financial Times Stock Exchange
MAR	Market to Asset Ratio
MMW	Mason, Miles and Wright
MRP	Market risk premium (also known as the equity risk premium)
OBR	Office of Budget Responsibility
ORR	Office of Rail and Road
PR09	Price Review 2009
PR14	Price Review 2014
PR19	Price Review 2019
R_D	Cost of debt (return on debt)
R_E	Cost of equity (return on equity)
R_f	Risk-free rate
R_M	Return on the market (also known as TMR)
RCV	Regulatory capital value
RPI	Retail price index
SCP	Small company premium
TMR	Total Market Return (also known as R_M)
UK	United Kingdom
UKRN	United Kingdom Regulators Network
WACC	Weighted average cost of capital
WASC	Water and sewerage company
WOC	Water only company

1 Introduction and Summary

The Consumer Council for Water (CCWater) commissioned Economic Consulting Associates (ECA) to update the bottom-up analysis presented in our November 2017 report on the Weighted Average Cost of Capital (WACC) to apply to the England & Wales (E&W) water companies in the period from 2020 to 2025.¹

In this short report, we revisit our previous WACC calculation for new data on:

- ❑ Forecast inflation,
- ❑ Cost of debt, and
- ❑ Cost of equity.

We also look at lessons from recent regulatory precedents and publications, and address (in the Annex) a number of specific issues raised by CCWater, including the impact of Brexit.

Summary

In December 2017 Ofwat proposed an early view for the *appointee* nominal WACC of 5.47%.² This was within a range of 5.07% to 5.89%, although Ofwat considered a more tightly bound range, of 5.27% to 5.68%, as plausible.³ This compared with the range we considered reasonable in November 2017 of 4.89% to 5.53%.

Our updated view of the nominal WACC is 4.78% to 5.45%, which is slightly lower than our previous estimate, and remains lower than Ofwat's early view. As in our previous study, one influence that we have not separately considered is from the financeability of companies. An assessment of financeability could be a factor influencing the range and choice of point estimate for the WACC.

Our revised view of the components of our nominal WACC estimate is provided in Table 1 below, alongside Ofwat's point estimates from its early view.

¹ [Recommendations for the Weighted Average Cost of Capital 2020 - 2025](#), ECA, November 2017.

² For the purposes of this report, we focus on the appointee WACC, ie covering water companies' retail *and* wholesale activities. Ofwat, in its early view, deducted 10 basis points from the appointee WACC for the retail margin to derive the wholesale WACC.

³ We used Ofwat's real (RPI) WACC ranges and assumed RPI inflation (of 3%) in the Fisher equation to derive these nominal WACC ranges.

Table 1 Summary of (appointee) WACC parameters

Parameter	ECA Nov 2017	Ofwat early view	ECA Jan 2019	Comments
Nominal cost of new debt	3.10%	3.40%	3.90%	Our view on the cost of new debt is changed (from 3.1% to 3.4%) in line with changes in benchmark yields – we have also included an uplift of 50 basis points for expected future changes.
Nominal cost of embedded debt	4.60% - 4.90%	4.64%	4.60% - 4.90%	Our view of the range for the cost of embedded debt is unchanged.
Ratio of new: embedded debt	25:75	30:70	30:70	We adopt Ofwat's early view, as we understand it was informed by better information than we have access to (eg investment requirements and timing of re-financing).
Nominal cost of debt⁴	4.23% - 4.45%	4.36%	4.39% - 4.60%	
Nominal Total Market Return	9.00% - 9.53%	8.6%	8.19% - 9.21%	We have updated the total market return to the range proposed in the UKRN's cost of capital report (of 6-7% real CPI and applied our CPIH inflation assumption).
Nominal risk-free rate	3.00% - 4.03%	2.1%	1.90% - 2.10%	We have updated the nominal risk-free rate using UK government gilt yields at the mid-point of the PR19.
Equity Risk Premium	6.00- 6.50%	6.5%	6.29% - 7.11%	
Equity beta	0.5-0.6	0.77	0.55 - 0.65	Our calculation of the observed beta based on an average of various beta calculations and a small upward adjustment in recognition of uncertainty of whether observed or "re-gearred" betas should be used.
Nominal cost of equity	6.00% - 7.33%	7.13%	5.36% - 6.72%	
Gearing	62.5%	60%	60%	We adopt Ofwat's proposed notional gearing of 60%.
Nominal vanilla WACC (appointee level)	4.89% - 5.53%	5.47%	4.78% - 5.45%	
Inflation assumption (CPIH)	2.00%	2.00%	2.07%	Adopted OBR CPI forecast for 2022/23 (mid-year of PR19) as proxy for CPIH.
Real (CPIH) WACC (appointee level)	2.83% - 3.46%	3.40%	2.65% - 3.31%	
Inflation assumption (RPI)	3.00%	3.00%	3.07%	Assumed a 100 basis point increase from CPIH forecast for RPI forecast.
Real (RPI) WACC (appointee level)	1.84% - 2.46%	2.40%	1.66% - 2.31%	

⁴ Ofwat's nominal cost of debt includes an addition of 10 basis points for issuance and liquidity costs and their cost of new debt a deduction of 15 basis points for companies' outperformance of the proposed market benchmark (sometimes referred to as the 'halo' effect). The net effect of these

2 Update of WACC parameters

In this chapter, we consider new data since our November 2017 report, regarding:

- ❑ inflation,
- ❑ cost of debt (new and embedded), and
- ❑ cost of equity (risk-free rate, total market return and equity beta).

2.1 Inflation

In our November 2017 report, we assumed RPI inflation of 3.0%, informed by the Office of Budget Responsibility (OBR)'s forecast and HM Treasury's aggregate forecast from various independent forecasters. Ofwat, in December 2017, also assumed a long-term RPI forecast of 3.0%.

Since November 2017 inflation forecasts have increased somewhat. Table 2 shows the OBR's latest CPI and RPI forecasts and those collated by HM Treasury. Given the problems with RPI as a measure of inflation,⁵ and the increased emphasis on CPI and CPIH, we propose adopting a CPI forecast and applying a wedge (discussed below) to derive an RPI forecast. We propose using OBR's CPI inflation forecast for the financial year 2022/23 (the middle year of PR19) of 2.07%, shown in Table 2. Given the relative similarity historically between the indices, we assume the CPIH forecast to be the same as the CPI forecast.⁶

two factors (neither of which we show separately in this table) is to increase the cost of debt by around 5 basis points. We have not explicitly included these factors in our cost of debt estimate but consider that their net effect falls within our proposed range on the cost of debt.

⁵ See, for example, the 'Johnson Review' - [UK Consumer Price Statistics: A Review](#), January 2015 and [Shortcomings of the Retail Prices Index as a measure of inflation](#), ONS, March 2018.

⁶ Ofgem also assumed an equivalence between CPI forecasts and CPIH expectations in its December 2018 RIIO-2 sector specific methodology consultation (pg 5, [RIIO-2 Sector Specific Methodology Annex: Finance](#)).

Table 2 Inflation expectations 2018-2023

Calendar year	2018	2019	2020	2021	2022	2023
OBR forecasts						
CPI	2.58%	2.05%	1.97%	2.12%	2.08%	2.04%
RPI	3.46%	3.14%	3.05%	3.16%	3.11%	3.07%
HM Treasury forecasts						
CPI	2.5%	2.1%	2.0%	2.0%	2.1%	
RPI	3.4%	3.2%	3.1%	3.3%	3.3%	
Financial year	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24
OBR forecasts						
CPI	2.49%	1.91%	2.06%	2.11%	2.07%	2.03%

Source: OBR, HM Treasury

In our 2017 report, we assumed a difference of 100 basis points between RPI and CPIH, resulting in a CPIH forecast of 2.0%.⁷ Ofwat also used a difference of 100 basis points in its early view. We note that Ofgem, in its December 2018 sector specific methodology consultation, proposed a wedge between RPI and CPIH of 1.009%,⁸ based on OBR forecasts. However, we also note that in recent years the difference between CPI and RPI has tended to be below 1%. Overall, we have not seen sufficient evidence to change our previous view of a 100 basis points difference between CPIH and RPI.

2.2 Cost of debt

2.2.1 Summary and context

In its early view for PR19, Ofwat estimated a nominal cost of new debt of 4.36%. In the table below, we show the nominal cost of debt for PR14 along with estimates for PR19 made at different times.

Table 3 Summary of cost of debt estimates (nominal terms)

	Ofwat PR 14	ECA Nov 17	Ofwat Dec 17	ECA Jan 19
Nominal	5.39%	4.23% - 4.45%	4.36%	4.39% - 4.60%

Source: Ofwat, ECA analysis

The cost of debt is based on a weighted average of the cost of new debt and embedded debt.

2.2.2 Cost of new debt

In November 2017, we proposed a nominal cost of new debt of 3.10%. Ofwat's early view was 3.40%. The main difference between these values was because Ofwat included a

⁷ <https://obr.uk/box/revised-assumption-for-the-long-run-wedge-between-rpi-and-cpi-inflation/>

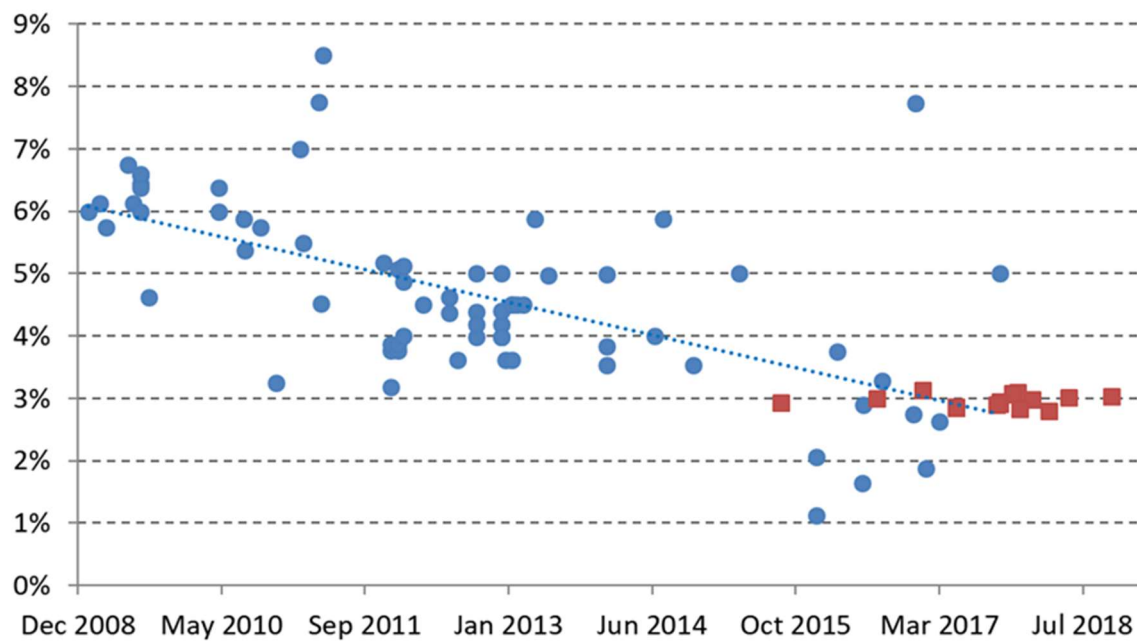
⁸ Pg 5, *ibid.*

forecast of the change expected in new debt costs by the middle of the price control (which was for an increase), whereas we adopted a spot rate. As Ofwat had proposed reconciling the cost of new debt to changes in its market benchmark, we did not consider it necessary to factor in a future increase in interest rates into the calculation for the new cost of debt. However, for the purposes of easier comparability to Ofwat’s initial view, and predicting the WACC that will prevail in the price control period, we include an estimate of the expected change in future rates in this report (discussed further below, in this section).

Water company bond issuances

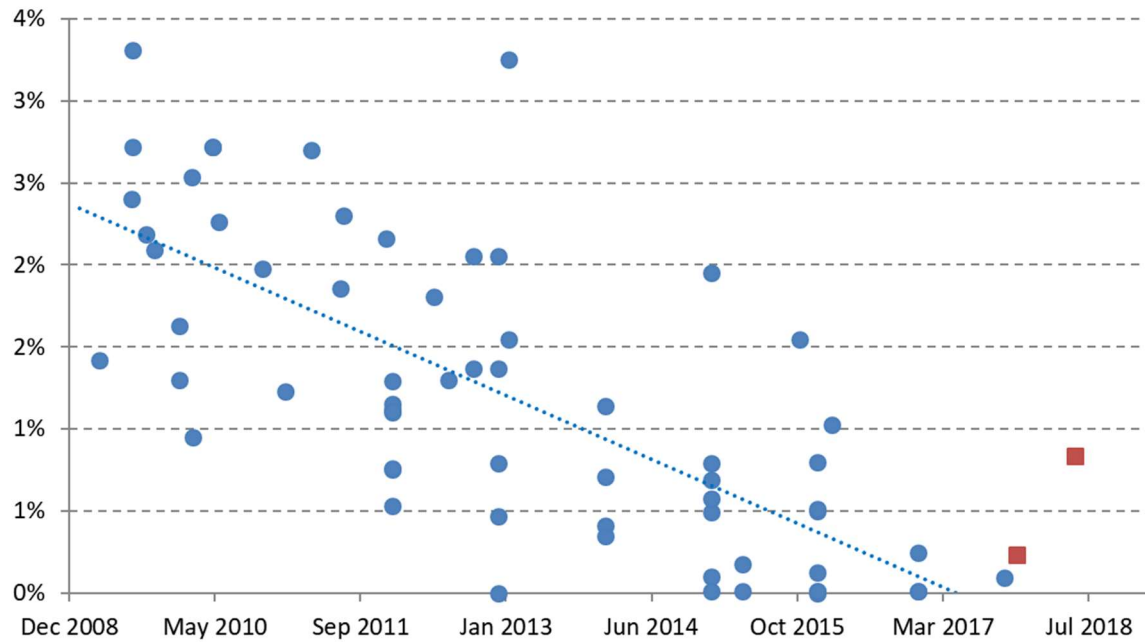
Water companies have issued a number of bonds since our previous study in November 2017. Figure 1 shows the fixed rate bond issuances and Figure 2 the index linked bond issuances from December 2008 onwards, which we have identified, with additions since our previous study shown in red.

Figure 1 Water utilities fixed rate bond issues



Source: iBoxx, APR, Cbonds, Google Finance ECA analysis

Figure 2 Water utilities index linked bond issues

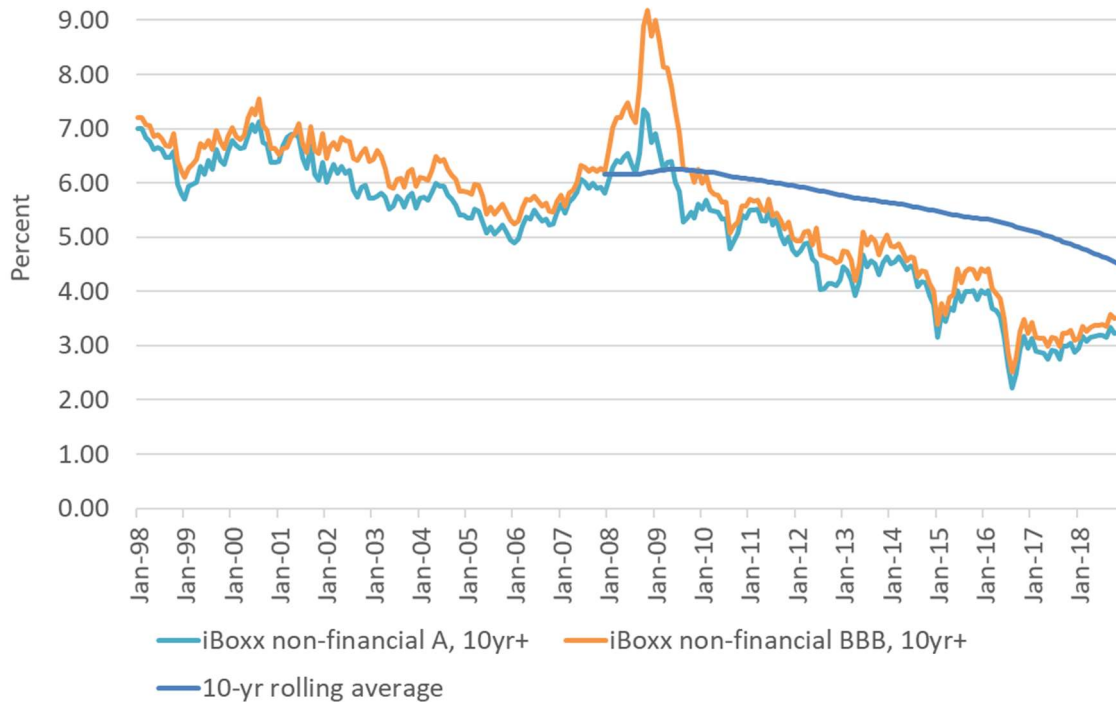


Source: iBoxx, APR, Cbonds, Google Finance ECA analysis

Market debt costs

As noted above, our cost of new debt was based on the prevailing spot rate of the market benchmark Ofwat proposed to use, shown in Figure 3. Given the slight increases in these benchmark yields over the past year, we propose a slight increase in our nominal cost of new debt from 3.10% to 3.40%. As stated above, in our previous report, we did not include an adjustment to this spot rate for future potential changes. In this update, for the purposes of better comparability to Ofwat’s initial view, we are proposing an addition of 50 basis points for expected changes, informed by nominal forward yield curves (Figure 5). This results in a nominal cost of new debt of 3.9%.

Figure 3 iBoxx benchmark yields and 10-year rolling average



Source: iBoxx, ECA analysis

2.2.3 Cost of embedded debt

In November 2017, we proposed using an embedded cost of debt in the range 4.6% to 4.9%, with the range informed by the 10-year trailing average of the iBoxx benchmark yields, and the nominal debt costs reported in companies’ APRs. Ofwat proposed 4.64% as its early view in December 2017.

An update of additional information from the iBoxx index (Figure 3) suggests that whilst nominal yields have risen from the lows seen in 2016, the 10-year rolling average, weighted at 50% each for A and BBB 10 year + bonds, continues to fall. This trend is likely to continue for the next couple of years, based on the logic of a 10-year rolling average, unless bond yields increase above the levels caused by the financial crisis, evident between 2008 and 2010.

The weighted average of the nominal cost of debt reported in companies’ Annual Performance Reports (APRs) across 2015/16 and 2016/17 was just under 4.4% as we previously reported (see Table 4). In 2017/18, the weighted average cost of debt reported for the year (at 4.84%) was higher than in 2016/17 (at 4.61%), but remained within the range we proposed.

Table 4 Nominal interest rate for embedded debt

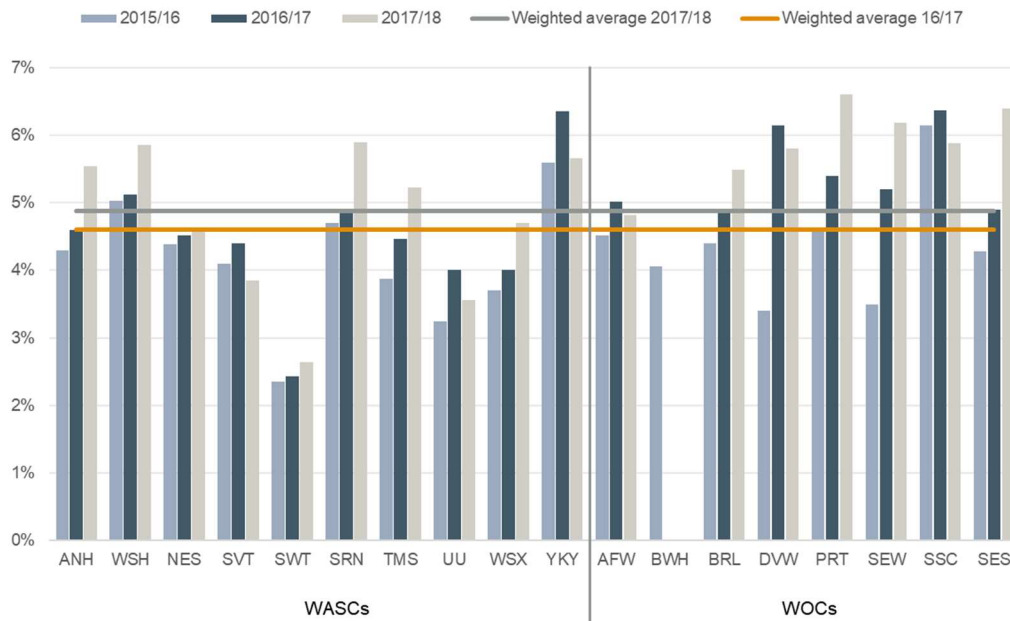
	15/16	16/17	17/18	15/16-16/17	15/16-17/18
Weighted nominal interest rate	4.14%	4.61%	4.84%	4.38%	4.58%

Source: ECA analysis

We illustrate the weighted average cost of debt in 2016/17 and 2017/18 in Figure 4 below (as well as the nominal costs of debt for each company in 2015/16, 2016/17 and 2017/18). We note that the debt costs of the individual companies may vary significantly from the weighted average.

Based on the additional evidence, we do not propose changing our view on the nominal cost of embedded debt as being within the range of 4.6% and 4.9%.

Figure 4 Nominal cost of debt – 2015/16, 2016/17 and 2017/18



Source: Annual Performance Reports 2015/16, 2016/17 and 2018, PR14 Final Determination, PR 19 ECA analysis

2.2.4 Conclusion on cost of debt

Based on the new information, we have updated our cost of new debt, but left the range for embedded debt unchanged. We have also accepted Ofwat’s early view of the new to embedded debt ratio being 30:70, as it appears to have been informed by better information than we have access to (eg regarding companies’ investment requirements and the timing of re-financing existing debt).

Table 5 Updated cost of debt estimate (nominal terms)

Parameter	Value
Cost of new debt – nominal	3.9%
Cost of embedded debt – nominal	4.6% - 4.9%
Ratio of new debt : embedded debt	30:70
Cost of debt	4.39% - 4.60%

Source: ECA analysis

2.3 Cost of equity

In the table below, we show the nominal cost of equity for PR14 along with estimates for PR19 made at different times.

Table 6 Summary of cost of equity estimates (nominal terms)

	Ofwat PR 14	ECA Nov 17	Ofwat Dec 17	ECA Jan 19
Nominal cost of equity	8.45%	6.00% - 7.33%	7.13%	5.36% - 6.72%

Source: Ofwat, ECA analysis

We estimated the cost of equity using the Capital Asset Pricing Model (CAPM) which is the conventional approach followed by Ofwat and other regulators:

$$R_E = R_f + \beta_E(R_M - R_f)$$

Where:

- ❑ R_E is the cost of equity,
- ❑ R_f is the risk-free rate,
- ❑ β_E is the equity beta for the nominated company or industry,
- ❑ R_M is the estimated total return on a market portfolio of shares, and
- ❑ the term $(R_M - R_f)$ is the estimated market risk premium (MRP).

In our update, we look at new evidence on the risk free rate (R_f), total market return (R_M) and equity beta (β_E).

2.3.1 Risk-free rate

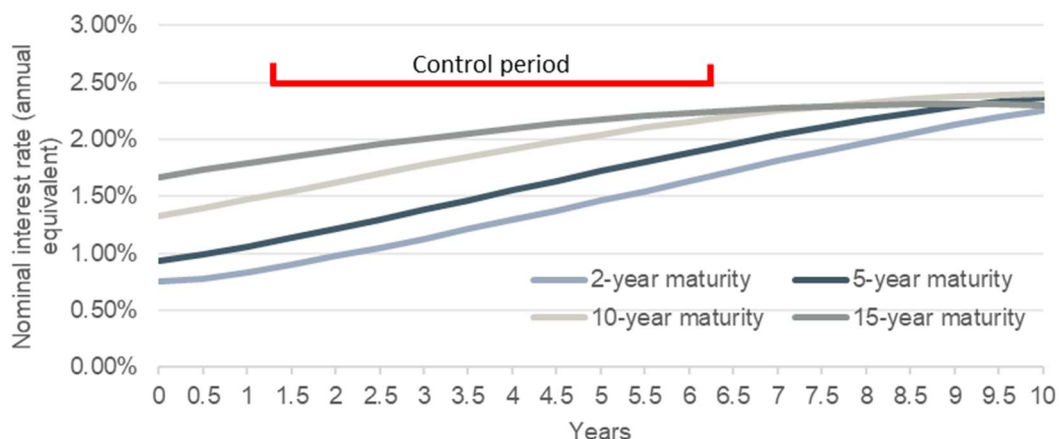
In November 2017, we proposed a real risk-free rate of between 0.0% and 1.0%. Ofwat's December 2017 view of the real RPI risk free rate was between -1.27% and -0.48%. As we noted in November 2017, there is considerable uncertainty in market conditions and challenges to making 'traditional' adjustments when market factors are both unusual and unpredictable. These unusual market conditions included quantitative easing and flight to safer assets, with the effect of deflating prices and suggesting that the low interest rates may be temporary.

In considering the risk-free rate, we examine the nominal forward yield curve for UK Government gilts. Since our last publication, these nominal forward yield curves have become more condensed as illustrated in Figure 5 and Figure 6. The key findings are:

- ❑ Lower nominal interest rates for all maturities (a reduction of around 15-22 bp) at 10 years, and across the control period; and

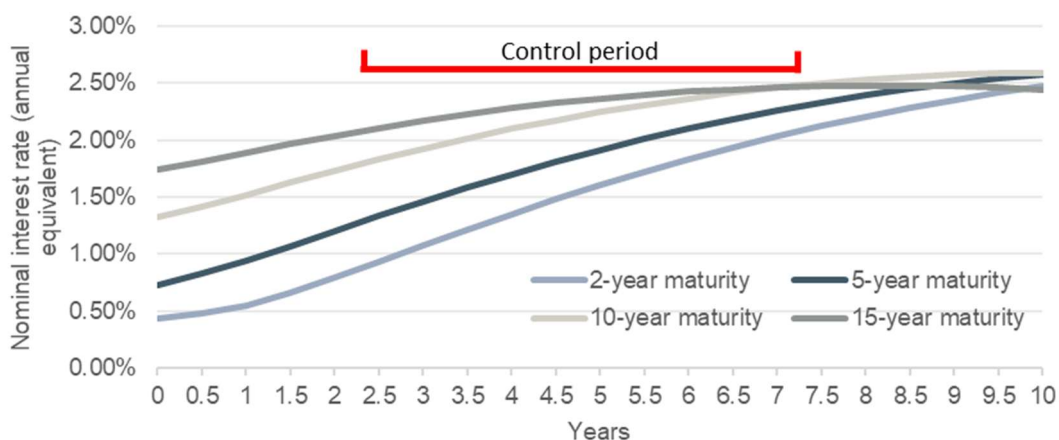
- ❑ The starting risk-free rate is higher for 2- and 5-year instruments, constant for 10-year instruments, and slightly lower for 15-year instruments, indicating higher interest rates and increasing inflation in the shorter-term which was not evident in 2017.

Figure 5 Nominal forward yield curve for UK Government gilts 2018 update



Source: BOE, ECA analysis

Figure 6 Nominal forward yield curve for UK Government gilts 2017



Source: BoE, ECA analysis

In terms of recent regulatory precedent, Ofcom set a real (RPI) risk-free rate of 0% in March 2018, equivalent to a nominal risk-free rate of 2.9% using their RPI inflation forecast.⁹ In addition, there have been a number of other regulatory views on the risk-free rate, including:

- ❑ Ofwat’s early view of a nominal risk-free rate of 2.1% for PR19, based on the mid-point between yields on 10 and 20-year gilts, uplifted for an expected increase.¹⁰

⁹ [Wholesale Local Access Market Review: Statement – Annexes 17-27](#), Ofcom, March 2018.

¹⁰ [Delivering Water 2020: Our methodology for the 2019 price review Appendix 12: Aligning risk and return](#), Ofwat, December 2017.

- ❑ Ofcom's proposal of a nominal risk-free rate of 1.6%, for a charge control period ending in 2020/21.¹¹ This relatively large move from Ofcom's March risk free-rate (of 2.9%) reflects their proposal to place increased weight on recent data compared to their previous approach of placing weight on long term averages of yields on index linked gilts.
- ❑ Ofgem's working assumption of a nominal risk-free rate of 1.34%, based on a spot rate.¹² This is a working assumption as Ofgem has proposed updating the risk-free rate during the price control period for changes in UK government bond yields.

Conclusion

Viewing the yields on longer-term maturities at the mid-point of the next price review, around four years from today, we estimate a range for the nominal risk-free rate of 1.9% to 2.1%. In practice, given our assumption of a constant total market return, changes in the risk-free rate have a relatively limited impact on the cost of equity.

2.3.2 Total Market Return (R_m)

In our November 2017 report, we used a real (RPI) total market return of 6.0% to 6.5%, which was equivalent to 9.00% to 9.53% in nominal terms based on our then RPI assumptions. This was informed by long term (116 years) equity returns from Dimson, Marsh and Staunton (DMS), as well as regulatory precedent. Ofwat, in its December 2017 early view of the WACC, applied a total market return of 5.44% real RPI, or 8.60% in nominal terms. Ofwat looked at range of evidence on market returns, including long-run averages and forward-looking assessments.

Since our previous report, the UK Regulators Network (UKRN) has published an extensive cost of capital study, jointly commissioned by the CAA, Ofcom, Ofgem and the Utility Regulator. That study, in part, updated analysis in an earlier report by Mason, Miles and Wright (MMW), 2003. One of the recommendations of the March 2018 UKRN report was that "*... regulators should continue to base their estimate of the EMR [equity market return] on long-run historic averages, taking into account both UK and international evidence, as originally proposed in MMW. We suggest a modest downward adjustment of the original range [of 6.5% to 7.5%] proposed by MMW, to a range of 6-7%, primarily reflecting a smaller adjustment from geometric to arithmetic returns.*"¹³

The UKRN report used DMS data (as our report had), but also applied a consistent (Bank of England) CPI inflation series to nominal returns, resulting in a lower estimated CPI-based total market return for the UK. Table 7 summarises the long-term DMS returns data used in the UKRN report, for different countries/regions and, in the case of the UK, different currencies and inflation indices. The report arrived at the real CPI total market

¹¹ [Business connectivity market review: Annexes 1-22](#), Ofcom, November 2018 (updated December 2018).

¹² [RIIO-2 Sector Specific Methodology Annex: Finance](#), Ofgem, December 2018.

¹³ [Estimating the cost of capital for implementation in price controls by UK Regulators](#), UKRN, March 2018.

return of 6% to 7% by making an upward adjustment to the geometric average returns (of around 5% to 5.5%, as shown in Table 7) to an arithmetic average.

Table 7 Summary of DMS long-term real (geometric average) returns on UK and global stock markets

	UK, £ (DMS inflation)	UK, £ (CPI inflation)	UK, \$	World, \$	World, ex US, \$	US, \$
1899 to 2016	5.48%	5.23%	5.07%	5.05%	4.33%	6.39%
1899 to 2000	5.88%	5.58%	5.61%	5.36%	4.63%	6.79%
2000 to 2016	2.97%	3.01%	1.78%	3.16%	2.43%	3.87%

Source: Appendix E, UKRN report (2018)

As part of its Framework Decision for RIIO-2,¹⁴ Ofgem confirmed it considered historical long-term averages of market returns as the best objective measure of investors' future expectations, whilst taking account of forward-looking measures. In its subsequent working assumption for the cost of capital, Ofgem proposed a range for the total market return of 6.25% to 6.75% (real CPI), ie a tighter range within that proposed by the UKRN report based on long run averages. Ofgem noted that these long run averages tend to result in higher estimate of the market return than forward looking measures but preferred to place most weight on these long run averages to provide investors and consumers with the benefit of predictability and stability in the regulatory regime. Ofgem also noted that the long run averages could support a lower total market return.

As described in our November 2017 report, in estimating the total market return, we prefer to place most weight on long-term historical averages. This position is consistent with the recommendations of the UKRN report and Ofgem's recent views. For this update of the cost of capital, we propose adopting the estimate of total market returns based on the UKRN's report in the range of 6% to 7% in real CPI terms.

2.3.3 Beta

As we stated in our 2017 report there is no standard way of calculating an equity beta from market data. The calculation is based on the covariance of returns over a given period. One can change the length of measured period, the returns measured and the start date of the measurement, therefore variation between our proposed beta value and the companies' and regulators' beta is expected.

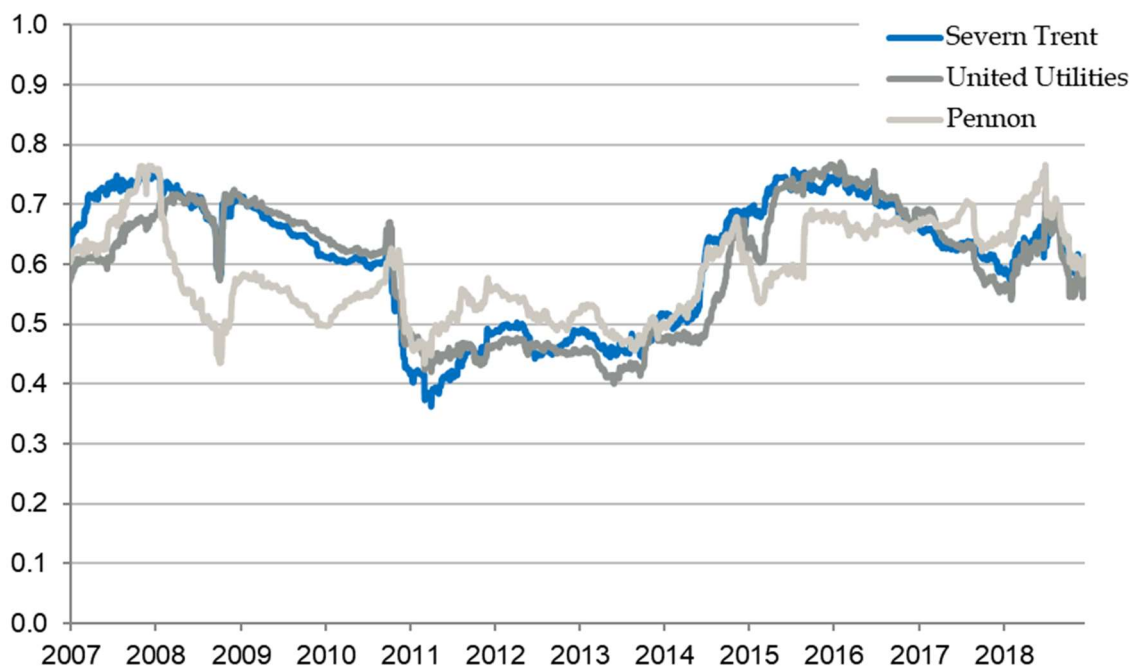
In November 2017 we proposed a beta between 0.5 and 0.6 informed by betas calculated using a range of methodologies.¹⁵ By way of comparison, Ofwat used an equity beta of 0.77, in its December 2017 early view of the cost of capital.

¹⁴ [RIIO-2 Framework Decision](#), Ofgem, July 2018.

¹⁵ Our methodologies involved different lengths of measurement period, return period and start date of the measurements. We calculated "raw" equity betas – ie we did not de-lever the equity beta to obtain an asset beta and then re-lever using notional gearing (as Ofwat did for its early view of the cost of equity). Further details of our approach are presented in our November 2017 report.

Figure 7 shows updated two-year equity betas using daily price data for the same three large listed water companies¹⁶ as in our previous report. Since our last report, these beta estimates have increased through early 2018, followed by a decrease to the end of 2018, leaving values much the same as they were a year ago.

Figure 7 Daily equity beta with two-year betas



Source: Yahoo Finance, ECA analysis

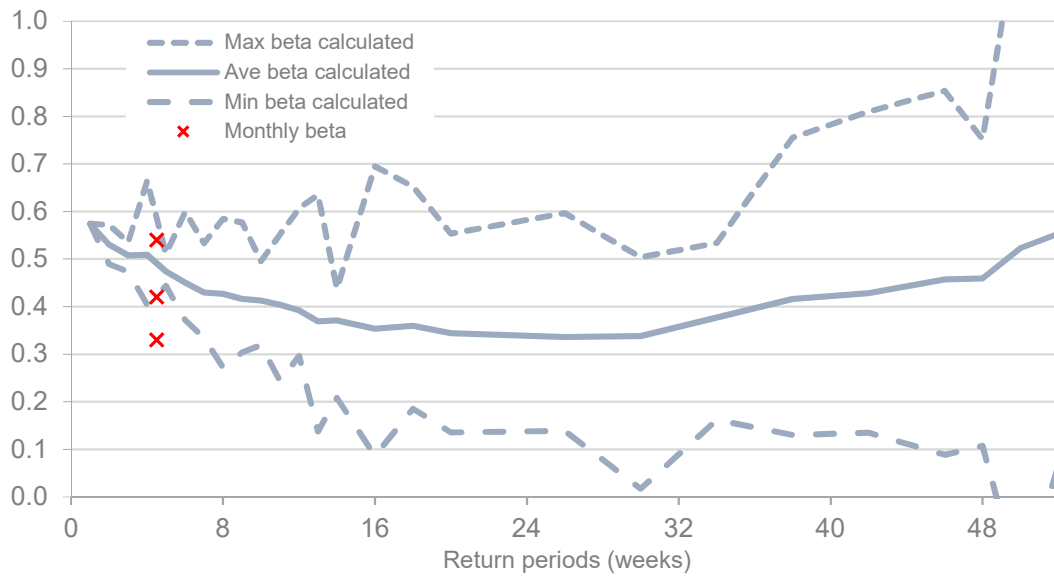
We re-ran the multiple simulations of our estimates of the ‘true’ equity beta for the same three large listed water companies. These estimates are presented in Figure 8, with the average, maximum and minimum of the set of beta estimates for each of the three companies, calculated at different starting points. All calculations in this analysis use 14 years of data to derive single point estimates of the equity beta (not a trailing average). We measured returns across those 14 years over increasingly longer periods, from 1 week returns to 52 week returns, and included monthly returns. That is, the 4-weekly betas are calculated from four different series of returns, each measured over a 4-week period but starting at weeks 0, 1, 2 and 3 in our series.¹⁷ Correspondingly, the 5-weekly beta is measured in five separate 5-weekly return periods starting at weeks 0, 1, 2, 3 and 4, up until the 48-weekly beta with 48 different starting points.¹⁸ We calculate the average of all the companies’ betas for each starting point, giving a series of beta estimates for each return period.

¹⁶ We removed Dee Valley from our analysis owing to its thin trading, price spike during its takeover offer period, and its eventual delisting.

¹⁷ Including a series starting at the 4th week will be identical to starting in Week 0, except that it won’t include the first data point.

¹⁸ One exception to this was for monthly returns, where our estimates were based on 31 simulations, measuring returns from every day of the month.

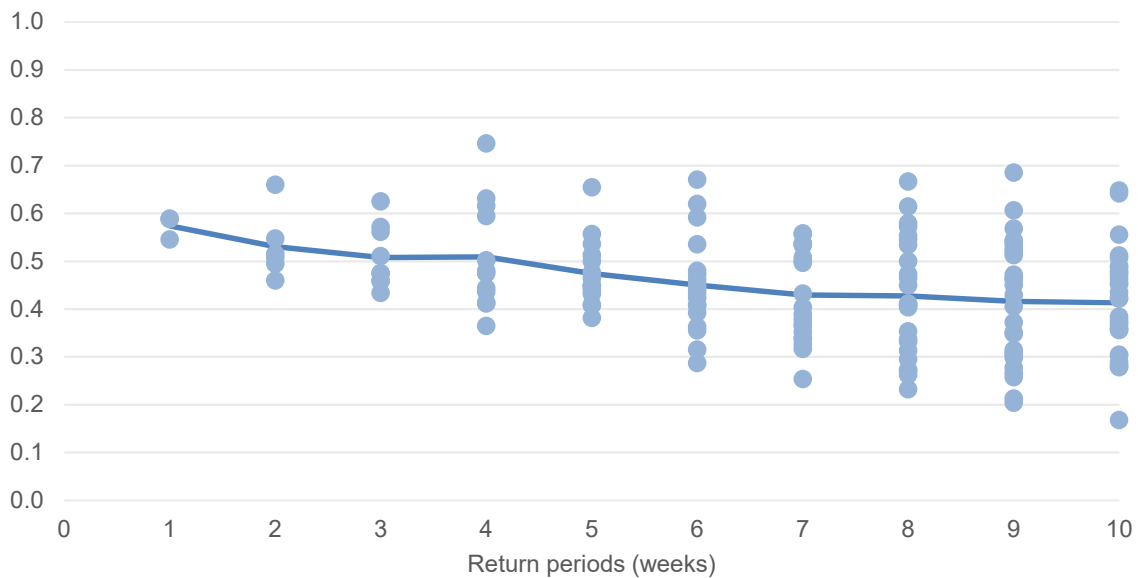
Figure 8 Sector equity betas with variable return periods and 14 years of data



Source: Yahoo Finance, ECA analysis

Figure 9 presents the spread of the various beta estimates from the analysis in Figure 8, only for return periods up to 10 weeks. As explained in our previous report, we consider that estimates at the left-hand end of this chart should be the most reliable. These show a range for the beta of around 0.5 to 0.6, which has not changed from our November 2017 report.

Figure 9 Spread of equity beta estimates



Source: Yahoo finance, ECA analysis

Conclusion (and comment on beta and gearing)

The results of our updated beta analysis are broadly unchanged. Our analysis, which encompassed a range of approaches, estimates an observed (or raw) equity beta. Whilst we used an observed beta, regulators (including Ofwat in its early view on the WACC) have often adjusted the observed equity beta for *actual* gearing (net debt / enterprise value) to derive an asset beta. This asset beta is then re-levered using *notional* gearing (net debt / RCV) to generate an applicable equity beta. In its recent published view, Ofgem noted that this approach “could boost notional betas to a level materially above observed market values.”¹⁹

There is not a definitive view as to whether observed betas or betas adjusted for notional gearing are appropriate. There was disagreement amongst the authors of the UKRN report on this issue, with three of the four very sceptical of the assumptions underlying “re-gearing” and arguing that “*estimated equity betas determine the marginal cost of equity, and should be used directly where companies are listed. For unlisted companies, or listed companies with unregulated activities, the methodology should be as close as possible to that applied to the pure-play listed companies.*”²⁰

As a pragmatic response to the uncertainty over whether to apply an observed beta, or a beta adjusted for notional gearing, we propose making a small upward adjustment to our estimate of the equity beta from our 2017 report, giving a range of 0.55 to 0.65.

2.3.4 Conclusion on cost of equity

Based on the above, we have updated our estimate of the cost of equity for changes in the risk-free rate, total market returns and the equity beta, as shown in Table 8.

Table 8 Updated cost of equity estimate (nominal terms)

Parameter	Value
Nominal Total Market Return	8.19% - 9.21%
Nominal risk-free rate	1.90% - 2.10%
Equity Risk Premium	6.29% - 7.11%
Equity beta	0.55 - 0.65
Nominal cost of equity	5.36% - 6.72%

Source: ECA analysis

¹⁹ Pg 39, [RIIO-2 Sector Specific Methodology Annex: Finance](#), Ofgem, December 2018.

²⁰ Pg 10, [Estimating the cost of capital for implementation in price controls by UK Regulators](#), UKRN, March 2018.

ANNEX: Other issues

In this Annex we address some issues, outside of the update of the WACC parameters, raised by CCWater, regarding:

- ❑ Regulatory precedents,
- ❑ Small company premium,
- ❑ The impact of Brexit, and
- ❑ Commentary from credit rating agencies.

A1.1 Regulatory precedent

In our previous WACC reports for CCWater we have examined UK regulatory precedents in energy and water networks. Since our November 2017 report, there have been no final determinations in these sectors. However, both Ofwat and Ofgem have published methodology decisions on their forthcoming price controls. Also, UKRN published a cost of equity study, commissioned by CAA, Ofcom, Ofgem and the Utility Regulator, and which informed Ofgem's initial views. Table 9 compares and comments on values relating to the cost of equity.

Table 9 Recent views of regulators on cost of equity parameters

Parameter	Ofwat	Ofgem	Comments
Total market return	8.6% (nominal)	8.42 - 8.93% (nominal) ²¹	<p>Ofwat chose a point estimate as an initial view based on the ranges provided by its consultants: EE estimated 8.2%-9%; and PWC 7.9%-8.4%. The difference in these ranges result from EE placing more emphasis on regulatory precedent and its own Dividend Discount Models (DDMs) and less weight on a Market to Asset Ratio (MAR) analysis. PWC uses its own DDM, MAR analysis and an investor survey, which tend to result in lower TMR estimates.</p> <p>Ofgem chose a working assumption informed by the UKRN study of a real TMR of 6-7%. Ofgem presented other data, including from DDM and the views of asset managers and financial organisations (the latter in the range 4.5% to 7.75% nominal) – but retained the view of placing most weight on long-term averages, as recommended in the UKRN study.</p>

²¹ Converted from real CPIH values of 6.25% and 6.75% using the Fisher equation and Ofgem's assumed CPIH forecast of 2.04%.

Parameter	Ofwat	Ofgem	Comments
Risk free rate	2.1% (nominal)	1.34% (nominal)	<p>Ofwat's estimate is the midpoint between the March 2017 yields on 10-year gilts (1.20%) and 20-year gilts (1.91%), uplifted for a predicted increase of 0.49%. This predicted increase was based on implied expectations of interest rate increases at the mid-point of the price control (of 0.69%) and reduced by 20 basis points for a term premium effect embedded in forward rates.</p> <p>Ofgem is proposing to index the cost of equity to the risk-free rate. For the purposes of a working assumption on the risk-free rate, Ofgem used an RPI spot (26/10/18) rate. The nominal value was derived using the expected RPI inflation rate of 3.07%</p>
Equity beta	0.77	0.646 – 0.762	<p>Ofwat's derived its early view of the equity beta by de-levering the observed equity beta (0.63) using observed gearing (49%) and then re-levering using notional gearing (60%) and applying a debt beta of 0.1.</p> <p>Ofgem used a raw equity beta of 0.6 to 0.7, de-levered and then re-levered it (using a debt beta of 0.15 to 0.1 and notional gearing of 60%).</p>

Source: Ofwat; Ofgem

A1.2 Small company premium

In our earlier report (February 2014) for CCWater recommending a WACC for PR14, we considered there was evidence that smaller WOCs could not raise debt at the level of larger companies. We concurred with the findings of PR09 and the Competition Commission (in its determination for Bristol Water) to have a small company debt premium and proposed a value of 0.3% to 0.4%.²²

In our more recent report (November 2017) recommending a WACC for PR19, we noted:

- ❑ Ofwat's use of a 25 basis points small company premium for PR14 (for those companies which demonstrated that the customer benefits of this premium more than offset the incremental cost);
- ❑ the Competition and Market Authority's use of a small company premium of 40 basis points for Bristol Water (based on the difference between WOC cost of debt (relative to iBoxx) and WASC cost of debt (relative to iBoxx); and
- ❑ the difference between WOCs and WASCs weighted average debt costs of 37 basis points (on average, across 2015/16 and 2016/17).

The following evidence or views have become available since our November 2017 report regarding the small company premium:

²² [Ofwat PR14 review: Recommendations for the Weighted Average Cost of Capital 2015-20](#), submitted to the Consumer Council for Water, page 43.

- ❑ Ofwat, in their PR19 Final Methodology, stated that they consider their PR14 approach is appropriate for PR19, including the 25 basis points uplift. Ofwat also noted that *“the yield spread between the water only company cost of debt and our view of the efficient cost of debt is now larger than at PR14.”*²³
- ❑ Europe Economics’ initial assessment of the cost of capital for Ofwat noted that the current cost of debt for WOCs is materially different to that of WASCs (by 96 basis points), although cautioned against using this difference as the additional cost WOCs may face.²⁴
- ❑ South East Water (SEW) commissioned NERA to prepare a cost of capital study. NERA identified:
 - ❑ a spread at issuance of 28 basis points between all outstanding WOC and WASC bonds; and
 - ❑ spreads of between 22 and 35 basis points for SEW’s bonds relative to a selection of WASC bonds.
- ❑ WOCs have put forward assumptions in their business plans, including:
 - ❑ SEW proposing a premium of 30 basis points (supported by NERA’s analysis mentioned above);
 - ❑ Bristol Water assuming a central estimate of 55 basis points, informed by and additional studies commissioned from First Economics (75 to 100 basis points) and KPMG (50 to 60 basis points, with a central estimate of 55 basis points);
 - ❑ Portsmouth Water assumed a 30 basis points premium, citing evidence from NERA, including a 22 basis points premium of 5 WOC bonds (excluding Affinity Water) to WASC bonds; and
 - ❑ Sutton and East Surrey Water assumed a 25 basis points premium.

In light of the above evidence, a small company debt premium of up to 30 basis points appears appropriate.

A1.3 Brexit

The potential impacts on water companies from the Brexit process are difficult to predict (as is the whole Brexit process). However, in this section we posit some possible outcomes for the sector.

²³ Pg 89, [Delivering Water 2020: Our methodology for the 2019 price review Appendix 12: Aligning risk and return](#), Ofwat December 2017.

²⁴ Table 9.2, pg 70, of [PR19 – Initial Assessment of the Cost of Capital](#), Europe Economics, December 2017, shows the average nominal interest paid on WOC debt as 5.81% compared to 4.87% for WASCs.

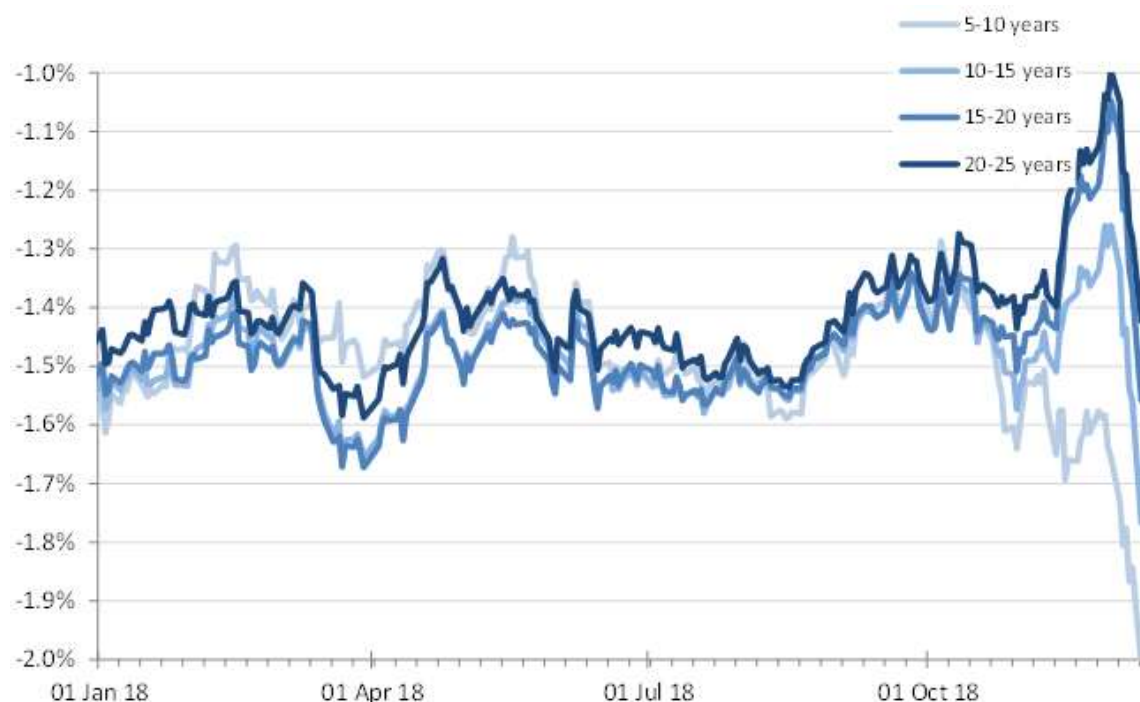
A1.3.1 Flight to safety

In the 2008 Financial Crisis, water companies were considered by some a ‘safe investment’, and as such, listed prices saw a small increase as investors bought shares. It is possible that Brexit may have a similar effect on water companies, with prices increasing. Such an increase may therefore lower future returns through increasing the base price against which returns are calculated. This shouldn’t affect the allowed returns in the regulatory process – water companies have remained stable through the uncertainty, potentially pointing towards a lower equity beta.

A1.3.2 Cost and availability of financing

We may see an impact on the cost of financing through a change in the risk-free rate (proxied by the Bank of England’s borrowing rate). We are in a prolonged period of negative real interest rates, which looks set to continue. Interestingly, events of early and mid-December have led to an unusual divergence in the forecast yields between shorter and longer-term instruments, as shown in Figure 10.

Figure 10 Prospective risk-free rates through implied real forward yield curves



Source: Bank of England

One explanation for this is that the market anticipates high inflation in the years immediately following Brexit, and then sustained lower interest rates following this to stimulate a weaker economy.

This lower risk-free rate will lead to lower (or at least sustained low) debt and equity²⁵ costs for a few years.

Many water companies have financing from the European Investment Bank. Whilst not certain, this source of (relatively cheap) finance may not be available to them after Brexit. This may put some slight upward pressure on the allowed cost of debt.

A1.3.3 The nationalisation agenda

If an outcome of the Brexit process is a change to a Labour government, then the nationalisation of water companies may come back on the political agenda. This obviously has enormous implications for the sector, although delivering on the policy would be difficult. One option may be for the government to purchase all the equity of the water companies but leave the debt.²⁶ Under the assumption that the pricing framework stays broadly the same (costs reflect the costs to serve customers), this will only affect the cost of equity in the WACC calculation. As this number is expected to be relatively low in PR19, the impact of decreasing this to a government cost of equity is expected to be minimal.

A second option is for the government to purchase all the equity and debt of the companies. This is less likely politically, given the vast amount of capital likely to be necessary. It would also be unclear what implications this would have for pricing, as such a policy would likely lead to a change in the regulatory pricing regime.

A1.4 Rating agencies

In this section, we present some excerpts from relevant rating agency reports on the water sector and its companies. Common themes include:

- ❑ Changes to 'negative' watches, but maintenance of ratings;
- ❑ Increased pressure on companies' ability to maintain strong performance because of the decrease in allowed returns;
- ❑ Challenges to those companies with relatively expensive embedded debt and difficulties refinancing this;
- ❑ Companies will likely need to revise their capital structures to better manage their credit ratings;

²⁵ The cost of equity is expected to remain low or decrease because we assume constant TMR. Therefore, a decrease in the risk-free rate will lead to an increase in the market risk premium. With an equity beta that is less than one, any increase in $MRP * \beta_e$ will be less than the absolute value of the decrease in the risk-free rate.

²⁶ It is unclear to us whether this is possible as, it has been reported, some bonds have clauses requiring repayment in this event.

- ❑ Concerns of increased regulatory risk from the changes to the regulatory framework; and
- ❑ Concerns that more of the allowed returns will be discretionary, through the incentive framework, and thereby increase risk for companies.

A1.4.1 Moody's

- ❑ 15 Jan 2018 (Sector, changed to 'negative')

*Highly geared firms with expensive, long-dated and/or small debt portfolios remain most at risk, but the sector as a whole will face pressure. Companies' borrowing costs will reduce over the period as they refinance at lower rates, but **most will likely underperform the future cost of debt allowances**, creating pressure on interest coverage metrics.*

*Lower returns and more volatile cash flows from enhanced incentives may require **adjustments to capital structures and balance sheet strengthening** if credit quality is to be maintained. Moreover, growing competition on upstream as well as downstream activities will increase the sector's business risk in the medium- to long term, although most of the impact may not be felt before 2025.*

*Solid sector performance will likely continue until the end of the current period in March 2020, but will not be sufficient to offset the pressure of low returns. On average the sector achieved a return on regulatory equity of around 6.3% over the first two years of the current regulatory period, in excess of the allowed 5.6% base return, with performance against total expenditure targets being the biggest driver. However, as expenditure and performance targets will likely tighten from April 2020, **outperformance potential for the average company will reduce.***

- ❑ 22 May 2018 (various companies, changed to 'negative')

*Ofwat's proposed measures -- aimed at bolstering companies' financial resilience -- mark a change in direction for the regulator in **reaction to mounting political and public pressure on the sector**. If implemented, the proposals would primarily penalise highly leveraged firms, curbing their earnings in an already tough regulatory environment. The measures further evidence **increasing regulatory risk**, which together with the potential earnings impact are the main drivers for today's outlook change.*

- ❑ 13 September 2018 (Dwr Cymru, changed to 'negative')

*In September 2018, we changed the outlook on Welsh Water to negative, reflecting (1) the company's **exposure to a likely significant cut in allowed returns from 2020** and more challenging performance targets, as guided by the regulator in its final PR19 methodology published in December 2017*

...

*additional pressure due to **the company's comparably high cost of embedded debt***

- ❑ 25 September 2018 (Bristol Water, change from ‘stable’ to ‘negative’)

*Bristol Water has a **relatively long-dated debt structure** and will **not be able to benefit from refinancing at the currently attractive interest rates** as assumed by the regulator within its cost of debt allowance. The likely reduction in allowed returns, as already indicated, by the regulator for the next regulatory period will therefore weigh on credit metrics.*

- ❑ 7 December 2018 (Sector, remains ‘negative’)²⁷

Moody's said it expects the sector outlook to remain negative if the regulatory review proceeds as anticipated and until companies demonstrate that they can meet the regulatory challenges in the context of the prevailing macroeconomic and political environment.

A1.4.2 S&P

- ❑ 7 February 2018 (Sector)

*S&P has calculated that Ofwat's reduction in the allowed cost of capital to 2.8% from the current 3.6% **would lead to a 1%-5% fall in water companies' revenues** between 2020-2025. The new elements of the methodology could make the water sector **less financially attractive to investors** as they could lead to an increase in the level of competition and to less predictable and less stable cash flows, S&P said.*

- ❑ 25 July 2018 (Thames Water, revision to ‘negative’ outlook)

*the **relatively high leverage** under which the company currently operates limits its ability to absorb any future additional weakening in profitability.*

Pressure may increase when the next regulatory period begins in April 2020, given the reduction in allowed cost of capital and more stretching benchmarks

- ❑ 26 June 2018 (Dwr Cymru, revision to ‘negative’ outlook)

We estimate that the reduction in the allowed cost of capital could lead to a 5%-6% fall in Welsh Water's revenues over the period 2020-2025

...

Dwr Cymru's balance-sheet leverage at its lowest level compares to peers, with a debt to RCV ratio of 57% as of March 31, 2018

A1.4.3 Fitch

- ❑ 9 July 2018 (Sector)²⁸

²⁷ <https://www.waterbriefing.org/home/finance-and-risk/item/15695-moodys-warns-outlook-for-uk-water-sector-remains-negative>

²⁸ <https://utilityweek.co.uk/fitch-downgrades-three-water-holding-companies/>

*We believe that the business risk in the UK water industry is increasing due to a tougher proposed regulatory package for the next price control, offering **lower cash flow visibility as more revenue will be at risk with a higher proportion of the allowed return linked to performance**,*

*We also factor in a modest **reduction in the long-term predictability of the regulatory framework**, driven primarily by the industry regulator's (Ofwat) recent decision on **sharing with customers capital structure-related outperformance** and introducing **more scrutiny around dividend distributions**.*