



TW-RR-A3

WACC

Case for Increased Uncertainty



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Section 1

PR19 WACC – April 2019

A Executive Summary

- 1.1 The purpose of this document is consider what is an appropriate fair return for AMP7 and beyond, taking into account the latest market evidence, Ofwat’s ‘early view’¹ and regulatory precedent, including recent reports issued by the UK Regulators Network (“UKRN”)².
- 1.2 The allowed cost of capital is a pivotal element of the price control, impacting bills and financeability. If set too high, customer bills will be higher than they need to be, if set too low it could put at risk the investment necessary to deliver the standards of service which customers expect.
- 1.3 In its methodology, Ofwat refers to the cost of capital as an ‘early view’ and acknowledges that it will “revisit the cost of capital for draft and final determinations in 2019”. This was important, as the PR19 final determination will be decided two years after its December 2017 publication of the ‘early view’ - which we used in our September 2018 business plan. Clearly, there are many factors which might impact the appropriate estimate for the cost of capital for the period from 2020-25 and these will need to be taken into account fully in the final allowance.
- 1.4 As set out in our September 2018 business plan we think that these factors can be broken down into four categories:
 - WACC methodology, including impact of the UKRN report published in March 2018;
 - Market evidence, taking into account changes in key variables such as risk free rate, inflation indices and forecasts, share prices (which impact on beta estimates) and additional evidence of the total market return;
 - PR19 methodology – how changes announced since December 2017, principally relating to ‘Back in Balance’, impact on the perception of risk in the sector and hence affect its cost of capital; and
 - Risk and reward balance, reflecting how Ofwat calibrates its allowed cost of capital with the range of incentive mechanisms it sets as part of the overall determination.
- 1.5 In order for us to better understand the potential impacts of these factors, we commissioned Frontier Economics to review in detail the potential changes to WACC methodology and what this may mean for the WACC estimate in the context of the latest market evidence.
- 1.6 Frontier Economics’ report, which is appended to this April Submission, indicates that changes in how the WACC should be estimated could add around 30 basis points to the original WACC

¹ Ofwat, Delivering Water 2020: Our final methodology for the 2019 price review (December 2017), Chapter 10, page 172

² The UKRN report “Estimating the cost of capital for implementation of price controls by UK Regulators”, March 2018



set out in Ofwat's early view. Movements related to changes in market rates are less significant, netting out to an additional six basis points at the time of Frontier Economics' review.

- 1.7 Frontier Economics' report highlights two significant issues relating to how the WACC should be estimated which constitute the key drivers for the difference to Ofwat's early view. The first relates to estimation of the total market return ("TMR") which was commented upon within the UKRN report (published after Ofwat's early view). In its estimation, Ofwat placed greater weight on current market evidence than recommended in the UKRN report. Taking a range of evidence using long-run historic averages from the UKRN Report, historical market data and the latest Credit Suisse Global Investment Returns Yearbook, Frontier Economics estimates a TMR in the range of 5.94% to 6.5% (on an RPI-stripped basis) for AMP7, from which it selects a central point estimate of 6.22% on a real, RPI-stripped basis.
- 1.8 On cost of debt, Frontier Economics reviewed the 15 basis point reduction to the allowed cost of new debt (often called the 'halo effect') which Ofwat intends to apply to reflect expected outperformance by water companies of its benchmark cost of debt indices. Frontier Economics' cost of debt estimate does not include a halo effect as it does not see evidence of this impact.
- 1.9 Frontier Economics also considered the UKRN's recommendations and follow up work undertaken by Ofgem, and Indepen³ to review how equity betas are estimated, noting options to consider alternative estimation techniques, time horizons and conversion to a notional structure. Its analysis indicates that the estimation techniques are similar and that the evidence is broadly consistent with Ofwat's asset beta estimate of 0.37.
- 1.10 Market data appears not to have moved significantly in net terms since Ofwat set its 'early view' in December 2017. Frontier Economics notes that the risk free rate has edged lower, but the impact of this on the WACC is more than offset by upward movements in debt indices. Significant uncertainties remain regarding the macro-economic environment, Brexit and its impact on the water sector, and we can expect further changes in the months ahead of the PR19 final determinations.
- 1.11 While Frontier Economics' work points to a WACC of around 2.7% for the appointed business, on a real RPI-stripped basis, we continue to use Ofwat's early view in April Submission data tables, ahead of further Ofwat analysis, as follows:
 - Appointed WACC of 2.4% (stated on a real, RPI-stripped basis); and
 - Wholesale WACC of 2.3% (stated on a real, RPI-stripped basis) for all of the wholesale price controls.
- 1.12 We request Ofwat to take into account during its draft and final determinations, the factors highlighted by Frontier Economics' work concerning the WACC estimation, alongside the wider implications from the calibration of the overall risk and return package within Ofwat's final allowance for the fair return.

³ Ofgem Beta Study – RIIO-2 Main Report, Indepen, December 2018



- 1.13 We have continued to adopt a net retail household margin of 1% as set out within Ofwat’s final methodology.⁴
- 1.14 Within this document, we draw out in more detail the key issues and uncertainties explored by Frontier Economics that we hope will help Ofwat in setting final allowances. We have structured our thoughts as follows:
- Section B sets out the broader economic and regulatory context within which the cost of capital estimate will be made;
 - Section C sets out views on total market returns, and what this means for the equity risk premium;
 - Section D considers the risk free rate;
 - Section E explores asset and equity betas;
 - Section F confirms use of notional gearing for the purposes of estimating the WACC;
 - Section G sets out views on the cost of debt;
 - Section H confirms that we have continued to use the WACC set out in Ofwat’s early view (in RPI-stripped and CPIH-stripped terms) and how we have applied this within the price control; and
 - Section I sets out our assumption for the net retail margin.

B Cost of capital – context and approach

Overall context

- 1.15 It is helpful to first consider the broader macro-economic and regulatory climate within which the allowed cost of capital for the 2020-2025 period is being set.
- 1.16 The UK water industry has been seen as relatively low risk, operating within a stable and highly regarded UK regulatory framework. Water businesses have benefited from this over the recent period of economic turmoil and have been able to raise funds at relatively low rates of interest. Providing the allowed return is seen to be consistent with the level of risk and investors remain confident in the stability of the regulatory regime, we should be able to continue to raise the funds required by the business at efficient rates.
- 1.17 However, the risk perception of the sector is changing. Moody’s issued a negative outlook for the regulated water sector on 5 December 2018, stating that “*the negative sector outlook reflects continuing regulatory, political and public pressure on the industry.*”⁵

⁴ Data table R8, Line 1 and Ofwat, Delivering Water 2020: Our final methodology for the 2019 price review (December 2017), Section 10.8.2.

⁵ Regulated water utilities – UK, “2019 outlook negative as companies steer through troubled waters”, Moody’s Investors Service, 5 December 2018.



PR19 methodology

- 1.18 Ofwat’s ‘early view’ was set out before it concluded on a number of key areas of its final methodology. Its consultation on putting the sector back in balance⁶ has been seen by some to reduce the stability and predictability of the regime. For example:
- On 22 May 2018 Moody’s issued a water sector comment headed “Regulator’s proposals undermine the stability and predictability of the regime”⁷. As a consequence Moody’s confirmed that it had “*changed our assessment of stability and predictability of the UK water regulatory regime under our methodology to Aa from Aaa*”; and
 - On 5 July 2018, Fitch issued an update⁸ to its rating for three water holding companies which was driven in part by its reassessment of industry business risk, noting “*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.*”
- 1.19 One of the main concerns is the sudden departure from the long-standing regulatory principle that financing remains a matter for companies. This principle has been fundamental in ensuring that the sector has remained investable on an efficient basis since privatisation. Fitch for example note that “*while lower gearing is credit positive, unexpected deviation from the regulator’s long-term impartial policy towards the companies’ financing structures increases the probability of unforeseen regulatory changes in the future.*”⁹
- 1.20 While the headline impact of Ofwat’s proposed changes focus on the more highly geared companies, the underlying shift in such a fundamental regulatory principle acts to increase investors’ perception of risk in the sector – as evidenced, for example, by the assessment of higher regulatory and sector risk by the rating agencies.
- 1.21 The allowed return also needs to reflect the broader economic environment and there is still significant uncertainty ahead, particularly with regard to Brexit. There are a number of potential outcomes including a no-deal Brexit, General Election, and a second referendum which could have a significant impact on financial markets and key components of the overall WACC allowance. Such impacts may not fully feed through into market data and expectations for many months. While in the past utility stocks may have been seen as defensive options, so reducing beta values, this may not be an appropriate assumption going forward given the heightened risk of nationalisation following publication by the Labour Party of its proposals in this regard.
- 1.22 Frontier has commented that “*Brexit and climate change are increasing the uncertainty and affecting market conditions*”. Noting that “*it is hard to quantitatively assess the potential*

⁶ “Putting the sector back in balance: Consultation on proposals for PR19 business plans”, Ofwat (April 2018), since confirmed by ‘Putting the sector in balance: position statement on PR19 business plans’, Ofwat (July 2018)

⁷ Regulated Water Utilities, TSD127-PR19-“Regulator’s proposals undermine the stability and predictability of the regime”, Moody’s Investors Service (22 May 2018)

⁸ Fitch Ratings, TSD101-PR19-“Fitch Revises Outlook on 3 UK Water Holding Companies to Negative”, (5 July 2018)

⁹ Ibid.



impacts. However, the uncertainty is likely to cause the true cost of equity to sit more towards the upper end of our estimated range”.

1.23 We expect Ofwat to take these factors fully into account when it makes its draft and final determinations in July and December 2019 respectively. We have not updated the cost of capital for market movements since Ofwat published its ‘early view’ at this stage, but we do reference latest data and direction of travel where relevant in the following sections.

Risk and reward balance

1.24 From our reading of the final methodology, we think that undiversifiable risk may increase because of changes such as:

- A wider range of risk and reward, as evident from the quoted RORE ranges and removal of the RORE cap;
- An upward shift in performance required (from average to upper quartile) by companies to earn their cost of capital; and
- An increasingly skewed set of returns to the extent that the reward upside is restricted due to a relative lack of customer support.

1.25 We made similar points in our response to the draft methodology, referring to the March 2017 EY report “*Towards a risk and reward framework for PR19: an exploration of the relationships between incentives, cost allowances and rates of return*” which demonstrated that, if the strength of ODI rewards and penalties is increased this will, all else equal, lead to an increase in systematic risk, increasing the rate of return required by investors¹⁰.

1.26 Frontier Economics also notes in its report that the effects of climate change add to risk in future price controls, and could operate to increase the cost of equity, given that:

- Climate change poses a risk to water companies through severe weather affecting supply;
- Water companies can mitigate against the risk of severe weather to some extent, but cannot fully hedge against climate change;
- Therefore, water companies are more likely to miss ODI and PCs and face associated financial penalties, and these may push the likely outcome of ODI into a more asymmetric distribution than envisaged in business plans; so
- This could increase the cost of equity.

1.27 It will be important that Ofwat calibrates the draft and final allowed cost of capital with the risk and reward balance associated with the range of incentive mechanisms set within the overall determination, including ODI reward and penalty rates, totex incentive rates, C-MeX and D-MeX, financing mechanisms and any notified items.

¹⁰ EY, TSD153-PR19-“Towards a risk and reward framework for PR19: an exploration of the relationships between incentives, cost allowances and rates of return”. A report for Thames Water Utilities Limited. (March 2017).



Cost of equity

1.28 In estimating the cost of equity, Frontier Economics' report adopts the historic regulatory approach and recommendations set out in the UKRN report to adopt the capital asset pricing model (CAPM) – which, as the UKRN report notes¹¹ is “*the best available model for assessing the cost of equity*”. This is supported by cross-checks to alternative models, such as dividend growth. Frontier Economics also supports estimation of the total market return and risk free rate to derive the equity risk premium.

C Total market return and equity risk premium

Total Market Return (“TMR”)

1.29 The TMR, which is the expected return on a market portfolio, is not directly observable. A number of approaches exist which try to estimate the TMR, the most established being to use long run historical stock market returns – an approach which has been adopted by regulators and the CMA consistently over the years.

1.30 In its ‘early view’ Ofwat placed more reliance on current market data, using a dividend growth model (DGM) or dividend discount model (DDM) approach, a formula which relates the expected return on the market portfolio to current dividend yields and the expected growth in dividends over time.

1.31 Using DGM to estimate the TMR is often undertaken to provide a cross-check to the more robust, reliable and proven use of long-run historic equity returns. However, we think that it is not suitable as the main estimating technique, a view which is supported by Frontier Economics on the following grounds:

- The DGM method requires three variables – stock price, future dividends, and the cost of equity, both two latter variables being unobservable;
- For a given stock price, there are infinitely many solutions for the cost of equity depending on what is assumed for future dividends;
- It is impossible to tell with certainty that any change in stock price is due to a change in expected future dividends or a change in the cost of equity; and
- Different assumptions made with regard to future dividends (especially longer term forecasts) lead to markedly different estimates of cost of equity (TMR in the case of the total equity market). Ofwat's reliance on one set of assumption on future dividends exposes its estimation to a high degree of potential error.

1.32 The UKRN study, released after Ofwat set its early view, recommends that “*regulators should continue to base their estimate of the EMR [expected market return] on long run historical averages, taking into account both UK and international evidence.*”¹²

¹¹ The UKRN report “Estimating the cost of capital for implementation of price controls by UK Regulators”, March 2018, page 7

¹² The UKRN report “Estimating the cost of capital for implementation of price controls by UK Regulators”, March 2018, page 8



- 1.33 The UKRN report highlights the difficulties involved in using DDM to estimate TMR. It illustrates this by specific reference to PwC's 2017 report to Ofwat showing the sensitivities of their TMR estimates to changes in assumptions – noting these to be “very wide ranges indeed: considerably wider than the range of long-run historic returns.”¹³
- 1.34 In its report, Frontier Economics finds little evidence of the decrease in the TMR as proposed by Ofwat informed by its DGM model, as it does not consider DGM to be the primary estimation method of the TMR. Frontier Economics does not assume a direct relationship between lower interest rates and lower returns on equity and note that there is no one correct way to interpret historical data on equity returns in real terms, as the reported real return data is neither entirely consistent with RPI nor with CPI.
- 1.35 Taking all of the evidence into account Frontier Economics estimates the TMR to be in the range of 5.94%-6.5% in real RPI terms, with a point estimate of 6.22% used in its overall calculation of the WACC.

Equity Risk Premium (“ERP”)

- 1.36 In taking a total market return approach, the equity risk premium is simply the difference between the risk free rate and the total market return.
- 1.37 Assuming an updated TMR of 6.22% (RPI-stripped) and an RPI-stripped risk-free rate of minus 0.88% (unchanged from Ofwat's early view) Frontier Economics estimates an updated ERP of 7.10% on the same basis (or 7.29% if updating for latest market data on the risk-free rate).

D Risk free rate

- 1.38 The risk free rate is one variable within which the effects of additional macro-economic uncertainty (e.g. associated with Brexit) might be expected to show.
- 1.39 Government 10 year gilts and forward curves have shown little movement over the period since Ofwat set its 'early view' (of 2.1% nominal, minus 0.88% real on an RPI-stripped basis). Frontier's report includes an updated estimate of minus 1.07% (RPI-stripped) based on latest market data and using Ofwat's estimation.
- 1.40 While this lower risk free rate would feed through into a lower overall WACC, we note that this impact is more than offset by movements in latest market data for other WACC components. We expect that Ofwat will review latest market data – such as that informing the risk free rate when setting the cost of capital allowance at draft and final determination.

E Equity and asset beta

- 1.41 Betas are typically calculated for regulatory purposes using share price information over a relatively medium-long term horizon (5-10 years) on a daily basis, using a 1-5 year trailing

¹³ The UKRN report “Estimating the cost of capital for implementation of price controls by UK Regulators”, March 2018, page 45.



window. In its 'early view' Ofwat used two year betas, using daily data over 7 years to derive its asset beta of 0.37.

- 1.42 Since Ofwat set out its 'early view' there has been considerable attention focused in this area following the publication of the UKRN report in March 2018 and a follow up report published in December 2018 by Indepen¹⁴, Ofgem also set out its initial thoughts as part of its RIIO-2 consultation in December 2018.
- 1.43 We asked Frontier Economics to consider these issues in more detail, it reached similar conclusions that OLS is generally as good as GARCH for beta estimation, and that it is therefore appropriate to continue to use OLS in beta estimation for PR19. Frontier Economics also finds that beta estimates may vary over time, but that these have not moved significantly since Ofwat last estimated them in December 2017.
- 1.44 We also note that Ofgem has recently published initial beta estimates in its RIIO-2 consultation, with a key departure from Ofwat's approach based on an additional finding of the Indepen study relating to how observed equity betas are re-gearred into a beta for the notional company.
- 1.45 Frontier Economics also considered this issue as part of its review. It found that the logic behind the revised approach suggested by Indepen and proposed by Ofgem is flawed and in conflict with finance theory. On this basis, we do not think that it would be appropriate for Ofwat to adopt a similar adjustment in its updated view of the WACC.
- 1.46 We also note that it is important when re-gearing to use an appropriate reference point for the observed firms, i.e. an average gearing level over the reference period for the share price data should be used, not the spot actual gearing position for each firm at the end of the time horizon used (we note that Ofgem used the latter approach in its RIIO-2 consultation).
- 1.47 Considering beta estimation as a whole, we have seen no compelling evidence to suggest that Ofwat should move away from the approach it adopted to beta estimation within its 'early view'. Share prices of water stocks, relative to market returns, are a set of variables within which the effects of risks systematic to the water sector would be expected to show. Further, Frontier Economics' review of asset beta estimates does not indicate any clear evidence which would justify Ofwat departing from its asset beta estimate of 0.37 within its early view – again this will be another variable to keep under review through to draft and final determinations.
- 1.48 We also note that Ofgem makes a further adjustment to its allowed cost of equity (by 50 basis points) to reflect outperformance by energy networks of totex and output targets. We do not think that it would be appropriate to apply a similar approach in water, on grounds of regulatory principle and differing practice in how totex allowances and performance commitments within water compared to energy. Frontier Economics considers the arguments and weaknesses in further detail as set out within the accompanying report.

¹⁴ Ofgem Beta Study – RIIO-2 Main Report, Indepen, December 2018



F Gearing

- 1.49 In its report, Frontier Economics assumes that the cost of capital is set by reference to the notional company, geared at 60% in line with Ofwat's final methodology for PR19.

G Cost of debt

- 1.50 Ofwat's approach at PR19 is to set the allowed cost of debt by reference to a weighted average of the cost of new debt and the cost of embedded debt. For PR19, the cost of new debt will be indexed in line with market rates. Therefore, the allowance for new debt will be a 'holding position' with allowances being trued up at PR24 for indexed costs. While this removes forecasting risk for this element, it will still be appropriate to ensure that initial allowances are as realistic as possible, assessed by reference to market evidence, to ensure that ex-post adjustments are minimised.
- 1.51 In contrast to the cost of equity, many elements of the cost of new and embedded debt are directly observable by reference to market data, Company business plans and actual cost of debt reported by companies. We consider each element below.

Embedded debt

- 1.52 Ofwat uses the actual cost of historic debt in company balance sheets, adopting the company-level median (to exclude outliers) cross-checked against the iBoxx A/BBB indices.
- 1.53 For part of the AMP6 period actual data was not available at the time of issuance of its 'early view' hence an iBoxx-based allowance for debt refinanced in final three years of AMP6 was assumed – adjusted for minus 15 basis points of outperformance and plus 16 basis points for forward movements.
- 1.54 For final embedded debt cost allowances we would expect Ofwat to take into account actual company debt costs for all years except 2019/20. Reference to iBoxx indices, forward rates and any expected outperformance would only be required for one year.
- 1.55 With the exception of the assumption made for expected outperformance of the iBoxx indices Frontier Economics advises that this is a sensible approach. This 'halo effect' is considered in more detail within our consideration of the cost of new debt below.

New debt

- 1.56 Ofwat's approach to the estimated cost of new debt reflects a combination of spot iBoxx non-financials 10+ year A and BBB indices, an uplift for forecast increases in market-wide borrowing costs over 2020-2025 and a reduction of 15 basis points for expected outperformance by the sector of the market indices (the 'halo effect').
- 1.57 Frontier Economics has reviewed both the methodology approach and reference market data.
- 1.58 On methodology, Frontier Economics does not agree with application of the 15 basis point reduction for the halo effect, on the following grounds:



- It is not supported by recent regulatory precedent. The Competition and Markets Authority (CMA) at the RIIO ED1 appeal from BGT¹⁵ concluded that the halo is not likely to exist even though it may have existed prior to 2013;
 - CEPA's analysis in 2016 found two bonds issued after 2013 and also found no halo effect¹⁶;
 - Europe Economics' analysis¹⁷ of the halo is based on a spread between the iBoxx utilities and the iBoxx non-financial. It is arguable that this is a less reliable method to measure halo effect compared to that used by the CMA;
 - NERA's report¹⁸ for Anglian Water in 2018 found that there is "*no evidence to support the halo effect when a comparison of water or energy bond issues and the benchmark index is undertaken on a like-for-like basis*"; and
 - The recent credit downgrade to the Ofwat regulatory regime following the December 2017 final methodology makes it even more unlikely that there would be any halo effect remaining in the water sector.
- 1.59 In its report, Frontier Economics sets out these arguments in more detail, concluding that there is no evidence to support the 'halo' effect'.
- 1.60 Frontier Economics also notes that there has been a small increase in corporate yields during 2018, with the iBoxx rate increasing from 3.01% to 3.49%. With gilt yields broadly unchanged, this implies that there has been a small widening in credit spreads, and that the allowed cost of new debt within the cost of capital should be uplifted accordingly.
- 1.61 While these changes are relatively small at the moment, we may see volatility and/or direction of yields changing more sharply going forward as the effects of Brexit developments feed through into market data. We would expect Ofwat to take latest market data fully into account within its final determinations.

Ratio of embedded to new debt

- 1.62 Ofwat assumed a 70:30 ratio of embedded to new debt split in its early view, but signalled that this could change following publication of company business plans.
- 1.63 We agree that the ratio should be updated following completion of company business plans. Frontier Economics included analysis of this ratio within its report and consider Ofwat's PR19 early view of 30% as too high and not supported by forecast or historic evidence. The assumption of 25% used at PR14 would be a more reasonable estimate (although arguably still erring on the high side).
- 1.64 We expect that Ofwat will reflect the final ratio of embedded to new debt contained in company business plans (including any updates made in April 2019) within its final determination of the allowed cost of capital.

¹⁵ CMA (2015): British Gas v The Gas and Electricity Authority: Final determination.

¹⁶ CEPA (August 2016): Alternative approaches to setting the cost of debt for PR19 and H7.

¹⁷ Europe Economics (December 2017): PR19 — Initial Assessment of the Cost Capital.

¹⁸ NERA (July 2018): A Response to Ofwat's Halo Effect for PR19, A Report for Anglian Water.



H WACC summary

- 1.65 While Frontier's work points to a cost of capital of around 2.7% for the appointed business, on a real RPI-stripped basis, we continue to use Ofwat's early view in our April submission data tables as set out by Ofwat on Table 10.2 of the final methodology document.
- 1.66 Table 10.2 shows two separate WACC numbers, 2.3% real, on an RPI-stripped basis, and 3.3% real on a CPIH-stripped basis. We have applied these WACC values to the relevant part of the RCV as set out in the transition arrangements for adoption of CPIH in Section 10.9 of the methodology document.
- 1.67 In summary terms, we have applied the RPI-stripped wholesale WACC to 50% of the opening RCV as at 1 April 2020, with the remaining 50% of the opening RCV plus all new RCV additions after that date being remunerated using the CPIH-stripped WACC.
- 1.68 Further details of how we have split the RCV for this purpose are set out in Appendix TW-RR-A2 Finance and Financeability.
- 1.69 We share the view expressed by Ofwat in its PR19 methodology that the separation of price controls within wholesale has no material impact on systematic risk for the 2020-2025 period. We have therefore used the same wholesale cost of capital for all of the wholesale price controls, namely:
- Water resources;
 - Wholesale water network plus;
 - Bioresources;
 - Wholesale wastewater network plus; and
 - Thames Tideway Tunnel.
- 1.70 As markets develop within bioresources and water resources, it would be appropriate to reconsider this assumption at future price controls. In view of the uncertainties at this stage regarding future developments, we have adopted the same wholesale cost of capital for the purposes of projecting forward estimates of future bills and financeability beyond the 2020-25 period.
- 1.71 The table below sets out the specific components of our cost of capital assumptions for the appointed and wholesale businesses taken from Ofwat's final methodology document. We have adjusted the asset beta for wholesale down by 0.015 to derive the wholesale WACC, effectively flowing the whole adjustment through the cost of equity (leaving cost of debt constant). A beta adjustment reflects the risk transfer from wholesale to retail, this approach is in line with that recommended by Ofwat within the data table guidance¹⁹.

¹⁹ For example, as set out by Ofwat within Data Table Wr5.



Table 1: Cost of capital assumptions for AMP7

Parameter	Appointed business, nominal	All wholesale price controls, nominal	Appointed business, real (RPI 3%)	All wholesale price controls, real (RPI 3%)	All wholesale price controls, real (CPIH 2%)
Risk-free rate (%)	2.10%	2.10%	-0.88%	-0.88%	0.09%
Asset beta	0.37	0.35	0.37	0.35	0.35
Debt beta	0.10	0.10	0.10	0.10	0.10
Equity beta	0.77	0.74	0.77	0.74	0.74
Equity risk premium (%)	6.51%	6.51%	6.31%	6.31%	6.37%
Post-tax cost of equity (%)	7.13%	6.88%	4.01%	3.76%	4.78%
Pre-tax cost of debt (%)	4.36%	4.36%	1.33%	1.33%	2.32%
Corporate tax rate (%)	17%	17%	17%	17%	17%
Gearing (%)	60%	60%	60%	60%	60%
Vanilla cost of capital (%)	5.47%	5.37%	2.40%	2.30%	3.30%
Deduction for retail margin	0.10%	n/a	0.00%	n/a	n/a
Vanilla cost of capital (%) - wholesale business	5.37%	5.37%	2.40%	2.30%	3.30%

Source: Ofwat PR19 Final Methodology and Thames Water analysis. Numbers may not add due to rounding

1.72 We would expect Ofwat to take into account during its draft and final determination the factors highlighted by Frontier Economics' report regarding how the WACC should be estimated alongside the wider implications of how it sets and calibrates the overall risk and return package within its final allowance for the cost of capital.

I Retail margin

1.73 We have continued to adopt a net retail household margin of 1% as set out within Ofwat's final methodology.²⁰

²⁰ Data table R8, Line 1 and Ofwat, Delivering Water 2020: Our final methodology for the 2019 price review (December 2017), Section 10.8.2.