

AffinityWater

AFW47 - Alternative WACC



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1. Introduction.....	2
2. Cost of equity.....	2
2.1. Risk-free rate (RFR)	2
2.2. Total market return (TMR)	3
2.3. Beta	6
2.4. Selecting an appropriate allowed return on equity	10
2.5. Notional gearing.....	12
2.6. Alternative estimate for cost of equity	14
3. Cost of debt	14
3.1. Cost of embedded debt	14
3.2. Cost of new debt.....	19
3.3. Additional costs of borrowing.....	22
3.4. Share of new debt.....	24
3.5. Alternative estimate for cost of debt	25
4. Retail margin deduction	25
5. Our overall WACC range.....	26
6. Annex 1- The context for setting returns at PR24.....	27
7. Annex 2 - Initial commentary on the Balance Sheet Cost of Debt Model and implications for the cost of embedded debt.....	32

1. Introduction

Our business plan adopts the early view WACC but we have highlighted our concerns with the early view WACC. This appendix outlines our view of an alternative, more appropriate WACC for PR24. We look at each component part of WACC and consider alternative methodologies which ultimately produce our alternative WACC.

This appendix is structured as follows: Section 2 and 3 explain our assessment of alternative calculations for Cost of equity and Cost of debt respectively. Section 4 briefly discusses the treatment of Retail Margin. Section 5 shows our calculation of alternative WACC. Annex 1 contains further analysis on the context of setting returns for PR24 and Annex 2 contains a KPMG report on Initial commentary on the Balance sheet cost of debt model.

This appendix should be considered in conjunction with the following documents:

- AFW22 Risk and Return Cost of Equity (KPMG Report)
- AFW23 Inference analysis

2. Cost of equity

In this section we set out an alternative estimate for the CAPM parameters used by Ofwat to derive the cost of equity. The alternative estimate is supported by the latest market data as well as additional empirical and theoretical evidence.

2.1. Risk-free rate (RFR)

Reference instrument

Ofwat has used the 1m trailing average of 20Y ILG yields, converted into CPIH terms using an RPI-CPIH wedge of 0.54%. We agree with the methodology of using long tenor ILG and 1 month averaging window for risk free rate. But we consider the deflation of RPI linked ILG to CPIH using wedge of 0.54% will need to be re-calculated in line with more recent data as we approach FDs. The KPMG report¹ calculated the CPIH real risk-free rate over June 2023 data at 1.48%.

Convenience yield

As acknowledged by Ofwat, academic literature finds that government bonds issued by countries with a high credit rating possess specific, money-like characteristics which result in their yields being lower than the zero-beta asset in the CAPM framework. This can be classified as a convenience yield (CY). Ofwat has acknowledged CY for nominal gilts but has not provided adjustment for the CY on ILGs. Qualitative analysis performed by KPMG suggests that CY is equally (if not more) applicable to ILGs. This suggests that the observed yield on ILGs would also

¹ AFW22 Risk and Return Cost of Equity - KPMG, August 2023 Pg. 49

need to be adjusted for CY to ensure that the resulting RFR meets the requirements of the CAPM². CMA in their PR19 decision also came to the same conclusion.

Differing risk-free borrowing and saving rates

Under CAPM assumption, investors can borrow and save at the same rate (risk-free rate). However, in real world borrowing rate is greater than the saving rate and similar concept applies to the risk-free rate. The CMA in their PR19 decision decided to use the AAA bond yield as upper bound for risk-free rate as an application of Brennan (1971) but Ofwat has not applied the same in their FM. Therefore, the ILG should be adjusted to incorporate the premium for borrowing, using a AAA-ILG adjustment.

Quantification of CY : Lower bound adjustment

There is limited academic literature that quantifies CY. Based on the two benchmarks i.e. 38bps estimate of CY(NG) from Diamond and Van Tassel (2021) and 11bps Ofwat analysis adjusted for swap illiquidity (supported by analysis done by KPMG report³). We estimate the CY yield to be between 11 bps and 38 bps and take a point estimate view of 24.5 bps CY premium on ILGs.

Quantification of AAA-ILG difference: Upper bound adjustment

The KPMG report⁴ uses the AAA-ILG difference calculated using approaches based on CMA PR19 FD, CAA H7 FD and AAA RPI-linked bonds. As discussed in the KPMG report, we will be using the RPI AAA bonds of 66bps for informing the AAA-ILG difference. It is the most recent benchmark with 02 Jul 18 (start date) 30 Jun 23 (end date).

Overall RFR estimate

The estimated range for RFR is as follows, which broadly follows the CMA's PR19 methodology:

- Lower bound: ILG yield plus 24.5bps (CY adjustment) and,
- Upper bound: ILG yield plus 66bps (AAA-ILG difference). Using the updated ILG of 1.48% and making the above adjustment suggests a risk-free rate of 1.93%.

When we incorporate this adjustment into Ofwat's given ILG yield of 1.48% CPIH-real, the resultant risk-free rate is estimated to be 1.93% CPIH-real.

2.2. Total market return (TMR)

There is a long-standing practice in UK regulation – informed by long-run empirical evidence – to assume that the TMR is a more stable component of the CoE than the ERP and should underpin the setting of allowed returns in price control regulatory determinations.⁵ As a result, we would not expect to see material changes in the

² On an adjusted basis ILGs do not completely meet the requirement of the RFR as applied in the CAPM, that all market participants can borrow at the same rate.

³ AFW22 Risk and Return Cost of Equity - KPMG, August 2023 Pg. 51

⁴ AFW22 Risk and Return Cost of Equity - KPMG, August 2023 Pg. 55

⁵ Pg 14 UKRN WACC paper

TMR relative to the estimate determined by the CMA at PR19 given that less than two years have passed between the CMA's decision and the FM.

However, the FM implies a 35bps decrease relative to the CMA estimate as set out in the table below. This reduction in TMR is driven via a combination of the relative weights assigned to different estimation approaches and how these approaches have been implemented in practice.

The table below shows the material reduction in TMR in Ofwat PR24 FM relative to CMA PR19 FD.

Table 1 Differences in TMR estimates: CMA PR19⁶ versus Ofwat PR24 FM⁷

CPIH	CMA PR19 FD			Ofwat PR24 FM		
	Lower bound	Upper bound	Mid-point	Lower bound	Upper bound	Mid-point
Historical ex post	6.55%	7.46%	7.01%	6.87%	6.96%	6.92%
Historical ex ante	6.15%	6.65%	6.40%	5.80%	6.20%	6.00%
Overall	6.15%	7.46%	6.81%	6.00%	6.92%	6.46%

In terms of the overall methodology, Ofwat has placed equal weight on historical ex post and ex ante approaches with no weight placed on forward-looking evidence. However, we consider that the most robust approach to estimating TMR is to use historical ex post returns as a proxy for investors' forward-looking expectations as this method is the least reliant on assumptions and forecasts. This approach also allows the regulator to 'look through' short-term volatility and distortions and maintain a stable and predictable TMR. Conversely, historical ex ante approaches are more reliant on assumptions (for example, on what factors are assumed to be repeatable / non-repeatable). As a result, whilst historical ex ante estimates can provide a relevant cross-check on the ex post figures, the former should not be used as the primary methodology.

Estimation of historical ex post TMR

The process of deriving real ex post TMR requires adjustments for both deflation and averaging technique. We have considered each of these factors in turn as follows.

Approach to deflating observed nominal returns

In 2022, the Office for National Statistics (ONS) introduced a newly modelled CPIH including homeowner occupiers' housing costs series, spanning the period between 1950-1989. With the integration of additional datasets, a synthetic CPIH index could be formulated. Given the improvements the new series offers over the previous CPI data, and its relevance in PR24 indexation, we consider it appropriate to employ the synthetic CPIH series for deflation.

⁶ [Final report \(publishing.service.gov.uk\)](https://publishing.service.gov.uk) – Pg. 839

⁷ [PR24 final methodology Appendix 11 Allowed return.pdf \(ofwat.gov.uk\)](https://www.ofwat.gov.uk/PR24-final-methodology-Appendix-11-Allowed-return.pdf) Pg. 37

Approach to Averaging

Determining the suitable averaging technique is a bifurcated process.

- Firstly, we need to assess if there's robust evidence about serial correlation in returns.
- Secondly, we need to take into account the positions of both the capital providers (investors) and capital utilisers (capital budgeters). The KPMG report suggests that the necessity of considering both perspectives lies in the variance in adjustments applied by both parties. This is to deduce the 'true' expected market return due to expectation errors and uncertainties. Consequently, the derived TMR estimates will vary based on whether both or only one perspectives are relevant.

Furthermore, empirical findings from KPMG report suggest the absence of significant serial correlation in returns, thereby endorsing the use of arithmetic average in TMR estimation. In contrast, the FM presumes the existence of serial correlation within the data.

As set out above, we consider that it is relevant to consider both investor and capital budgeter perspectives in TMR estimation. This is because regulatory WACC serves two purposes. It (1) guides investors in ascertaining the prospective value of their regulated company investments and (2) aids regulated entities in calculating present values for capital budgeting objectives. Recognising the relevance of both parties, as acknowledged by the CMA at PR19 FD, it is important to offer a 'neutral' market return estimator, embodied by the long-term arithmetic average.

Point estimate

In the FM, Ofwat presented TMR estimates using arithmetic averages, Blume, JKM Unbiased and JKM Minimum MSE estimator. Although in deriving the ex post range Ofwat focused on overlapping arithmetic averages, it also commented on the average TMR implied by all approaches. We believe there is merit in using only the arithmetic mean and annual data for estimating TMR.

KPMG notes that *“the use of an arithmetic average based on annual data is considered most robust due to its alignment with market practice (from corporates and investors) and neutrality in terms of holding periods and reinvestment assumptions”*.⁸

Following this approach, KPMG report estimates the TMR range implied by arithmetic averages, to be 6.96% CPIH-real, which is consistent with the historical ex post midpoint of 6.92% for the Ofwat PR24 FM.

Estimation of historical ex ante TMR

Ofwat has used variations of decomposition and dividend discount approach to derive the ex-ante TMR. As highlighted in the KPMG report⁹ the Ofwat approaches have a number of methodological issues.

⁸ AFW22 Risk and Return Cost of Equity - KPMG, August 2023 Pg. 27

⁹ AFW22 Risk and Return Cost of Equity - KPMG, August 2023 Pg. 34

Using the KPMG approach of adapted DMS decompositional approach and the implementation of the Fama-French DGM using an alternative data source, results in estimate of ex-ante TMR range of 6.33% – 6.45% CPIH-real, with a mid-point of 6.39%. This mid-point is in-line with the point estimate from CMA PR19 FD and higher than the Ofwat PR24 mid-point because of the changes in the methodology explained above.

Overall TMR estimate

Using the ex-post and ex-ante approaches, we estimate the TMR range to be 6.39% – 6.96%, CPIH real which is higher than the Ofwat PR24 FM TMR range of 6.00% to 6.92%.

2.3. Beta

Unlevered beta

This standard version of CAPM used in the regulatory process is an *unconditional* CAPM which does not distinguish between different potential future states of the world and does not consider that beta will vary over time. We support the arguments put forward in KPMG report that shorter duration betas will be inconsistent with other parameters used in CAPM calculations.

Unconditional beta remains unaltered by short term volatility in betas. There have recently been several structural shocks pertaining to Covid 19 and the Russian-Ukraine war. The structural change in the beta due these events appears to reflect a “flight to safety”¹⁰, which is artificially depressing the beta with respect to the market by raising the price of safer assets and reducing their expected return, while at the same time reducing the price of riskier assets and increasing their expected returns.

Placing undue emphasis on betas that are subject to ephemeral or transitory effects could distort the accurate representation of risks over a long-term investment horizon required for estimation of unconditional beta.

From a regulatory perspective, Ofwat has put forward the argument that the recent volatility can be neutralised using longer estimation and averaging windows. However, in practice Ofwat's range still attaches material weight to data affected by these recent market distortions.

To understand the potential impact of recent shocks to long-run beta, an analysis undertaken by KPMG¹¹ and Professor Gregory et al¹² has found that both Covid19 and the war have had significant negative impacts on recent water company betas.

¹⁰ On the impact of Covid19, see for example, [Interim Financial Stability Report May 2020 \(bankofengland.co.uk\)](#) p. i; [Learning from the dash for cash – findings and next steps for margining practices - speech by Sir Jon Cunliffe | Bank of England](#); [UK investment Management Industry: A Global Centre](#) p. 16

On the impact of the Russia-Ukraine war, see for example, [The Fed - The Effect of the War in Ukraine on Global Activity and Inflation \(federalreserve.gov\)](#), [Western credit markets are holding up remarkably well | The Economist](#)

¹¹ See, for example, KPMG (2022), Relative risk analysis and beta estimation for PR24

¹² Prof Alan Gregory et al (January 2021); Prof Alan Gregory et al (October 2020); Prof Alan Gregory et al (April 2020).

In this context, the weight that should be given to the data affected by Covid19 and the war in the context of setting long-run unconditional betas for PR24 should be based on two questions:

- How likely is it that pandemics with similar impact to Covid19 will occur over the (at least) 15Y investment horizon assumed by Ofwat
- Whether the impact of the Russia-Ukraine war likely to be temporary or protracted, relative to the investment horizon implied by the PR24 WACC?

On question 1, a study on frequency of pandemics estimates the base probability of experiencing a comparable pandemic is 0.38 to 0.76 in 100Y¹³, which suggests that the likelihood that another pandemic event occurs in the estimation window is low. The approach adopted by the CMA at PR19 also placed limited weight on Covid-affected data. The CMA recognised that this type of economic crisis is relatively rare and was likely to be over-weighted in the CMA's beta estimates, which covered the last 2-, 5- and 10-year periods¹⁴. KPMG's analysis of the CMA's approach suggests that c. 3.7% of data used to derive PR19 beta estimates could have been Covid-affected.

Notably, the Civil Aviation Authority in the Final Proposals for the H7 price control for Heathrow set a beta assuming that a pandemic-like event would occur once in every 20 or 50 years and last 17 or 30 months.¹⁵ This approach was retained unchanged in the Final Decision¹⁶, and has been found to be not wrong in the CMA's recent provisional findings for H7.

As a result, estimates informing the upper end of the beta range should assume a reoccurrence of Covid19 once in every 20 years.

On question 2, KPMG assessed that forecast inflation – the proxy to quantitatively evaluate the timing of reversion to 'normal' economic conditions following the war – is expected to revert to long-term target levels ahead of the start of the PR24 price control. In combination with the actions being undertaken to mitigate the economic impact of the war on Europe (for example via increasing self-supply of energy)¹⁷, this evidence implies that the impact of the war could reverse in the next couple of years and is not likely to be relevant for setting the allowed returns for PR24.

As a result, estimates informing the upper end of the beta range should exclude the impact of the war.

Additionally, Ofwat, KPMG, and Gregory et al acknowledge a structural break at PR14. From a statistical vantage point, longer-term beta estimates are preferable as they mitigate random variance, offer enhanced precision, and diminish transient influences. This perspective is consistent with both Ofwat's PR24 FM and Ofgem's

¹³ [Intensity and frequency of extreme novel epidemics | PNAS](#)

¹⁴ Ibid., para. 9.493

¹⁵ [Economic regulation of Heathrow Airport Limited - H7 Final Proposals Section 3: Financial issues and implementation \(caa.co.uk\)](#), section 9

¹⁶ See table 9.6 in [Economic regulation of Heathrow Airport Limited: H7 Final Decision Section 3: Financial issues and implementation \(caa.co.uk\)](#)

¹⁷ [REPowerEU \(europa.eu\)](#) implied increases in the self-generated supply of renewable energy and the decrease in the reliance on Russian exports can reasonably be expected to mitigate the price pressures arising from the war.

methodology for RII02. Therefore, we think it's appropriate to consider a long-term estimation window which captures data from 2014 onwards.

Taking into account all of the above, the KPMG report provides an unlevered beta range as follows:

Table 2: Unlevered beta estimate

Key consideration	Lower bound	Upper bound
Data source	SVT/UUW data, spanning October 2014 to June 2023	
Key adjustments and methodological rationale	Include the impact of PNN	
	<ul style="list-style-type: none"> Ofwat's decision to overlook structural breaks due to the Covid19 pandemic and the Russia-Ukraine conflict. Collaboration of insights from KPMG and Ofwat's identification of a structural break at PR14. Ofwat's endorsement of long-term analyses as more robust. 	<ul style="list-style-type: none"> Exclusion of the Russia-Ukraine conflict's effects. Assumption of a twenty-year cyclic recurrence of Covid19. The modus operandi intentionally negates transitory effects. By doing so, it aligns the beta estimates with long-term investment horizon expectations, consistent with CAPM principles.
Point estimate	0.29	0.32

Pricing in forward-looking systematic risk exposure informed by our notional risk assessment

Preliminary observation:

Historically derived and long-term betas, while theoretically relied upon, have limitations. Specifically, they may not wholly capture the anticipated risks tied to the forward-looking and material increase in PR24 capital programme. This observation draws from established corporate finance theory which postulates that as investment profiles shift, especially in a structural and systematic way, so do the underlying risks and hence the expected returns.

Our notional risk assessment sets out in the plan corroborates this observation, which focuses in key risk exposures (i.e. Totex and financing) driven by our PR24 investment programme. As a result, we consider it appropriate to factor in potential increase in PR24 systematic investment risk in our unlevered beta estimates.

Rationale for data source to price in PR24 increased systematic investment risk:

The KPMG report looks at investment-intensive UK Regulated sectors with analogous regulatory risks.

This is because, according to pricing theory, the most accurate risk predictors for a given sector are often those sectors with similar investment dynamics and regulatory

environments. The impending investment surge in the water sector is not only unprecedented but also presents a unique set of risks that necessitate a comparably intensive sector for appropriate adjustment on unlevered beta.

Incorporation of National Grid (NG) as a pertinent comparator:

The regulatory environments between the water sector and NG share a multitude of systematic characteristics. This similarity suggests that both sectors respond to macroeconomic stimuli in relatively comparable ways, aligning with the Modigliani and Miller propositions on market homogeneity.

NG's past RCV growth patterns offer a precedent that mirrors the anticipated growth trajectory for the water sector.

Therefore, we consider NG as an appropriate input in quantifying the unlevered beta uplift to price in increased investment risk at PR24.

Unlevered beta adjustment:

Drawing data from October 2014 to February 2022 (pre-war period) and adjusting for potential economic disruptors such as a 20-year cyclical recurrence of Covid19 events, KPMG report estimates the unlevered beta for a weighted portfolio of water companies and NG of 0.33. Given that CAPM posits that increased risk corresponds to heightened expected returns, the PR24's investment programme suggests a higher risk exposure to water sector, compared to NG during the RII01&2 periods.

Overall beta estimate

As computed in the KPMG report the lower bound of the unlevered beta range (0.29) is based on SVT/UUW data for the estimation window between October 2014 – June 2023, adjusted to include the impact of PNN. This estimate is conservative as it attaches weight to data since 2020 which is affected by temporary distortions due to Covid19 and the war. The upper bound of the unlevered beta range (0.32) is based on SVT/UUW data from October 2014 onwards adjusted to (1) include the impact on PNN and (2) exclude the impact of Russia-Ukraine war as betas will mean revert after the and assume a reoccurrence of Covid19 once in every 20 years consistent with CAA and CMA determinations.

Moreover, as described above, NG represents a good comparator which could better reflect the forward-looking risk exposure for the water sector owing to similar regulatory framework and RCV growth similar to the current investment intensity expected in the water sector. As per the KPMG report¹⁸ the unlevered beta for a weighted¹⁹ portfolio of water companies and NG based on data from October 2014 – February 2022 (i.e. before the inception of the war), adjusted to assume reoccurrence of Covid19 once every 20 years is 0.33. Since there is significant forward-looking risk in the sector primarily associated with high investment intensity which has not been experienced by the sector in regulatory price control and the expected tightening of the regulation going forward. We agree with the KPMG

¹⁸ AFW22 Risk and Return Cost of Equity - KPMG, August 2023 Pg.87

¹⁹ 67% weight assigned to SVT/UUW, adjusted to include PNN and 33% weight assigned to NG

estimate range for unlevered beta is 0.31-0.33 after incorporating the forward-risk exposure.

The table below combines the unlevered beta estimates with a debt beta of 0.10 and observed gearing to derive the equity beta range for PR24

Table 3 Notional equity beta range for PR24²⁰

Parameter	Lower bound	Upper bound
Observed gearing	52.20%	49.38%
Unlevered beta	0.31	0.33
Debt beta	0.10	0.10
Asset beta	0.36	0.38
Equity beta	0.75	0.79

2.4. Selecting an appropriate allowed return on equity

There is extensive regulatory precedent on aiming up from the mid-point of the CoE range.

The CMA set the point estimate for PR19 CoE 15bps above the mid-point of the CoE range to account for investment incentives in the context of parameter uncertainty, financeability, and asymmetric risk on ODIs (including possible changes in forward-looking risk exposure). Moreover, in this price control there is significant investment required. This proposed uplift will also ensure that investors are not discouraged to invest heavily in the sector. We consider that this is an appropriate list of factors to take into account in coming to a view on the appropriate point estimate for CoE.

Parameter uncertainty

CoE is not directly measurable, and the parameters are subject to both theoretical debate and statistical uncertainty. In the context of this uncertainty, the regulator's objective is to select a point estimate of CoE that will balance the potential welfare loss from under-estimation against welfare loss from over-estimation.

Parameter uncertainty continues to support aiming up at PR24 as there is no clear rationale why parameter uncertainty would have reduced relative to PR19; indeed given the more volatile and uncertain macroeconomic environment, it is more credible for parameter uncertainty to have increased. In the context of increased risk and volatility and increased investment, both the likelihood and the consequences for getting the allowed return 'wrong' are amplified.

Each of the CAPM parameters are exposed to estimation uncertainty and this uncertainty is inherently difficult to quantify. However, the analysis of CoE under leading multi-factor models (MFMs) which are statistically robust such as the q-factor model provides a good illustration of the magnitude of the potential understatement in the CAPM due to parameter uncertainty in beta.

²⁰ AFW22 Risk and Return Cost of Equity - KPMG, August 2023 Pg.11

Specifically, during PR19 appeal, the CMA explicitly acknowledged the intellectual merits of the outlined rationale, emphasising the prevailing uncertainties of estimation. The CMA's adjudication underscores its apprehensions regarding both the investment incentives and safeguarding consumer welfare, especially in scenarios marked by significant step change in investment. Based on this precedent, we agree that a minimum adjustment of 15 basis points – commensurate with the CMA's determination during the PR19 review – is appropriate to avoid disincentivising levels of investment required for AMP8 and beyond.

MFMs as a cross-check to PR24 CoE

The CAPM is a single factor pricing model which relies only on the market factor to explain observed returns. The simplicity of the CAPM, straightforward interpretation and the ease of calculation made it widely popular among academics and practitioners. However, academic research has over time identified a number of empirical shortcomings in the CAPM to explain observed returns.

The logical next step was to test whether additional variables (business or asset characteristics) – the additional 'risk factors' – improve the explanatory power of the CAPM, i.e. better fit the market data. This led to the genesis of MFMs. The key rationale for exploring MFMs as a cross-check for PR24 CoE is as follows:

- MFMs have been used as the preferred asset pricing models in academia for almost thirty years and are being increasingly relied upon by practitioners.
- MFMs are based on the same core underlying principle as the CAPM, i.e. that there is a direct relationship between risk and required returns. MFMs can be perceived as effectively augmenting and extending the CAPM with additional explanatory factors.
- The leading MFMs in academic research are underpinned by a combination of economic theory and empirical research.
- The latest MFMs have been proven to be statistically robust and to materially improve on the empirical performance of the CAPM²¹ based on US data²².
- MFM evidence improves the explanatory power of the CAPM based on a more granular and nuanced assessment of risk than the CAPM.
- The models have also evolved significantly since they were last considered by Ofwat.

The bar applied to MFM evidence as a potential cross-check in the KPMG report ²³(e.g. statistical robustness tests) is significantly higher than for any other cross-check applied by regulators. This implies in cross-checking the CAPM that weight should be

²¹ For example, Fama and French noted in 2004 that "unfortunately, the empirical record of the model is poor – poor enough to invalidate the way it is used in applications. The CAPM's empirical problems may reflect theoretical failings, the result of many simplifying assumptions. But they may also be caused by difficulties in implementing valid tests of the model". Eugene F. Fama and Kenneth R. French (2004), *The Capital Asset Pricing Model: Theory and Evidence*

²² For example, Fama and French (1993, 1996, 2015), Hou et al (2015), Green, J., Hand, J. R., & Zhang, X. F. (2017). The characteristics that provide independent information about average US monthly stock returns. *The Review of Financial Studies*, 30(12), 4389-4436.

²³ AFW22 Risk and Return Cost of Equity - KPMG, August 2023 Pg. 115

attached to evidence implied by the q-factor model over and above other cross-checks. Using MFMs is the minimum necessary as the q-factor model performs better than CAPM. In practice MFM evidence indicates that the point estimate for the allowed CoE for PR24 should be 0.39 – 2.96% higher than the mid-point of the CAPM-derived CoE range.

We understand that Ofwat has engaged with the MFM evidence in the FM and raised several technical comments which would need to be satisfactorily addressed before weight can be placed on MFM as an additional cross-check.

Financeability and risk analysis

Financeability tests are a critical cross-check on the judgments applied in setting the key parameters of the price control including the WACC, Totex allowances and incentives. A robust financeability test is an essential cross-check on the CoE as it is the only one explicitly linked to Ofwat's finance duty and the only one capable of directly reflecting the overall financial position of the regulated company under the proposed regulatory package.

Whilst market-based cross-checks have value – if chosen and calibrated correctly – their usefulness and relevance is less than that of the financeability cross-check as they are fully exogenous to the company and the price control parameters and lack the linkage with the finance duty.

Risk analysis also represents an important real world, corporate finance cross check on allowed returns in line with financeability requirements. A disconnect between risk analysis and returns calibration is likely to result in a price control where risk and return are out of balance, leaving companies exposed to excessive downside risks. Such an outcome could undermine financial resilience and investability of the sector.

Specifically, our notional risk assessment shows significant downside asymmetry and materially higher absolute downside risk in terms of RoRE risk ranges when compared to those assumed in the Final Methodology. This could mean (1) that the price control is not a fair bet (as investors cannot expect to earn required returns) and (2) the notional company is not financially resilient as downside exposure is higher than returns. We note that PCD downside risk (P10 -1.56% RoRE) is a key driver of asymmetry and remains unmitigated in our plan, driven by significant uncertainty around specification of this mechanism at this stage. Totex and financing also represent key drivers of our downside risk exposure at AMP8 with P10 RoRE impact of -2.57% and -1.09% respectively.

There is scope for changes to regulatory mechanisms and risk allocation as part of the Draft and Final Determination stages. As a result, we do not consider that aiming up for asymmetry and financeability in our plan is appropriate but we will re-evaluate the degree of aiming up required to address any residual asymmetry not addressed at source at the Draft Determination stage.

2.5. Notional gearing

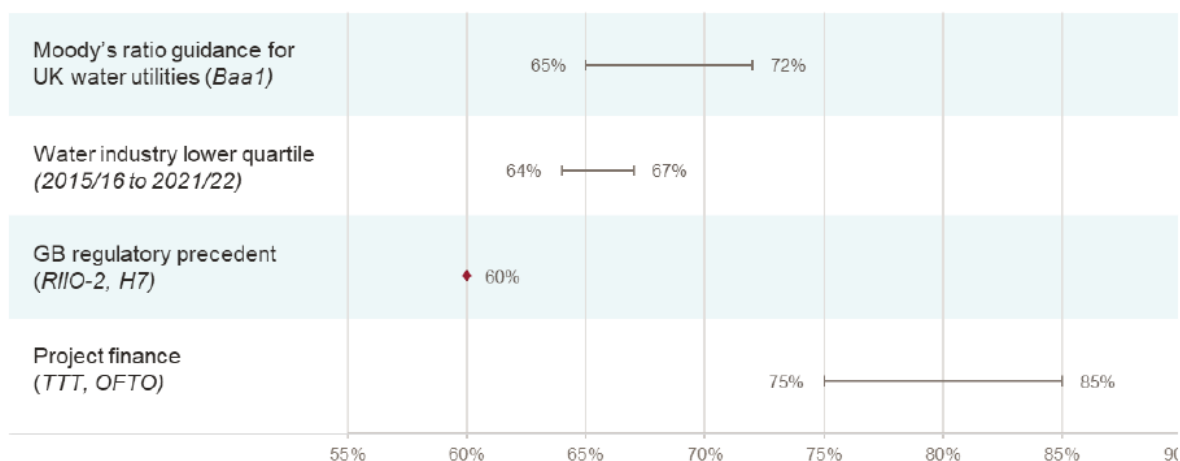
There is no robust basis for departing from the PR19 notional gearing assumption. We note that the CMA did not consider there was evidence to justify an alternative level

of gearing than the 60% applied at PR19²⁴ or that another level of notional gearing would better serve customers²⁵.

The notional capital structure should be based on market evidence for water companies as (1) water company financing is a proxy for efficiency, as per the balance sheet approach used to remunerate embedded debt costs (2) financeability tests will better capture implications of price control calibration for the financial resilience of the sector. This is consistent with the findings from the analysis commissioned by Water UK²⁶ which considered external, behavioural, and social factors in order to arrive at an estimate of the reasonable range for notional gearing and found that this purpose is best served by focusing on the market data and empirical evidence for regulatory gearing.

When measured using an appropriate gearing ratio for the sector (i.e. RCV gearing²⁷) market evidence across credit rating agency criteria, actual gearing rates, and regulatory precedent supports a range of 60%-75%. The current notional gearing level of 60% is already at the bottom of this range. The analysis does not find any evidence to indicate that the social optimal level of gearing would be below the level determined by the market evidence.

Figure 1 Summary of market evidence on gearing



We disagree with the argument that increasing risk exposure warrants an increase in headroom and hence a reduction in notional gearing. This appears to break the relationship between risk and return, because the reduction in notional gearing to manage increasing risks in the sector is not followed by the equivalent effect of an increase in cost of equity.

²⁴ CMA (2021), PR19 FD, para. 9.530

²⁵ Ibid, para. 9.44

²⁶ Frontier Economics (2022), Notional Capital Structure

²⁷ We disagree with the use of an enterprise value-based measure of gearing. As is widely acknowledged – including by the rating agencies – RCV represents the invested capital on which the water utility will earn a return over time, so the relevant measure of leverage is Net Debt to RCV. Enterprise value assumes a MAR greater than 1, however, this is not appropriate for the notional company. As acknowledged by MW, “the idea of a ‘notional’ firm is one in which both the firm and the regulator are efficient; in the latter case, this means, inter alia, that the cost of capital is set correctly and all other regulatory allowances are achievable, so that the MAR is equal to 1”. We note, the rating assessment by credit agencies uses RCV gearing unadjusted.

The KPMG analysis²⁸ also comments on other factors which are inappropriately used by Ofwat for justifying the 55% notional gearing:

- The observed gearing for all the water companies is greater than 55%, even the impact of inflation which temporarily decreased the gearing of the sector is reversing. Moreover, the 55% gearing creates a discrepancy between actual rating and notional rating for the sector.
- The positive effects for customers have not been evidenced by Ofwat in PR24 FM, it is expected that investors are likely to delay investment as a result as it would require to be funded by equity. With substantial higher investment predicted in the sector, it is not appropriate to add extra pressure on investors to add more equity.

2.6. Alternative estimate for cost of equity

Based on the above sections on risk-free rate, TMR, beta, notional gearing and uplift the cost of equity is illustrated in Table 4. CoE range after aiming up is between 5.43% to 6.10%.

Table 4: Cost of equity estimate

Component (CPIH)	AFW (June 2023 cut-off, 60% gearing)	
	Lower bound	Upper bound
Gearing	60%	
RFR	1.93%	
TMR	6.39%	6.96%
Observed gearing	50.79%	49.38%
Unlevered beta	0.31	0.33
Debt beta	0.10	0.10
Asset beta	0.36	0.38
Equity beta	0.75	0.80
CoE before aiming up, appointee	5.28%	5.95%
Aiming up for estimation uncertainty	0.15%	
CoE, appointee	5.43%	6.10%
RMA	0.00%	
CoE, wholesale	5.43%	6.10%

3. Cost of debt

3.1. Cost of embedded debt

In principle, we do not disagree with the use of the balance sheet approach – assuming that companies within the sector have comparable characteristics and hence inherent risks – for the estimation of CoD_E. However, we find that Ofwat's

²⁸ AFW22 Risk and Return Cost of Equity - KPMG, August 2023 Pg. 104

methodology for implementing the approach in practice (The Model) includes both calculation errors and errors in relation to the treatment of specific instruments. These errors would need to be corrected in order to arrive at an allowance for CoD_E that accurately captures the all-in cost of financing for the sector. Water UK has commissioned KPMG to develop an updated estimate of the sector's projected cost of embedded debt, which we understand will be shared with Ofwat in November. Annex 2 contains Initial commentary on the balance sheet approach to cost of debt which is also described below.

Refinancing

AMP7 RCV growth

The Model doesn't account for debt needed to finance projected RCV growth between 31 March 2022 and the end of AMP7. Including additional debt issuance to fund RCV growth for the remaining of AMP7 could raise the cost of embedded debt, as new debt costs are currently higher.

Fixed and index-linked debt refinancing

The Model refinances maturing debt in AMP7 using Ofwat's cost of new debt assumption for AMP8, which is based on a 1m trailing average of iBoxx A/BBB 10+ yields minus a 15bps benchmark index adjustment. However, removing the 15bps reduction, as suggested by the CMA given lack of sufficient evidence, could increase the cost of embedded debt.

Floating rate debt refinancing

The Model refinances floating rate debt maturing in AMP7 using the floating rate benchmark as of September 2022 and the margin on the existing instrument. A more appropriate approach might be to use a margin reflecting current market conditions and applied sector-wide, similar to fixed rate and index-linked debt.

Debt maturing on last day of AMP7

The Model doesn't refinance fixed and index-linked debt maturing on 31 March 2025. Refinancing this debt using Ofwat's cost of new debt assumption could increase the cost of embedded debt.

Double-counting and share of new debt

The Model partially double counts the cost of new debt in the cost of embedded debt by refinancing debt maturing in AMP8 using Ofwat's cost of new debt assumption, and floating rate debt at the rate noted above. Removing this double count could reduce the cost of embedded debt.

Additionally, given the scale of refinancing and the capital programme in AMP8, Ofwat will need to carefully evaluate the share and cost of new debt for AMP8.

Exclusion of swaps and intercompany debt

The Model excludes swaps and intercompany debt by omitting their costs and refinancings. This may not be appropriate, as these debts might not be refinanced with the same category of debt. Including swap/intercompany debt refinancings, as done by Ofgem at ED2, could increase the cost of embedded debt.

Amortisation and accretion

Principal balance

The Model adjusts principal balances as of 31 March 2022 for amortisation and accretion until the end of AMP7 but doesn't account for these adjustments during AMP8. This may result in misstated interest costs for AMP8.

Amortising debt assumptions

The Model assumes all amortising debt in the sector has been amortised on a straight-line basis since issuance. However, most amortising debt has an initial non-amortisation period followed by straight-line amortisation until maturity. This approach may understate amortisation.

Amortisation check

The Model includes a check for over-amortisation but not for under-amortisation. This could amplify the risk of under-amortisation, as it only identifies cases where the amortisation adjustment results in a negative principal balance.

Index-linked debt assumptions

The Model assumes principal balances for index-linked debt as of 31 March 2022 are linked to March 2022 inflation index values. In practice, principal balances are likely linked to index values from several months earlier. This should be considered in the modelling of accretion for AMP7 and AMP8.

Refinancing amortising debt

The Model refinances debt maturing in AMP7 at the interest rates noted above. However, for amortising debt maturing in AMP7, the balance is often amortised to a value close to zero at maturity and not refinanced before AMP8. Consequently, the assumed interest rates for refinancing are paired with near-zero balances.

Modelling debt balances

Cost of embedded debt calculation

The Model should incorporate interest costs and debt balances in a consistent basis, including adjustments for issue discounts/premia and wrapping fees. While the Model calculates interest costs using an effective interest rate approach, it uses principal outstanding balances as the relevant debt balance, which is inconsistent and may result in misstatement of the cost of embedded debt.

Model's estimation approach

The Model directly estimates an average cost of embedded debt over AMP8 instead of modeling debt balances and interest costs annually and then calculating an average cost. This approach reduces transparency and limits the ability to sense check results.

Model updates and interest costs

Updating the Model for double-counting cost of new debt and average cost of embedded debt over AMP8 approach would imply that interest costs in each financial year are calculated by multiplying interest rates by debt balances at the financial year-end position. This means that all instruments are assigned an interest cost of zero in their financial year of maturity. This only holds where an instrument matures at the beginning of the financial year, however this is unlikely to be the case in practice and so a majority of instruments will incur interest costs in their financial year of maturity. It follows that, by disregarding each instrument's actual maturity date, the Model may be distorting the cost of embedded debt.

Model functionality, inclusion criteria and other methodological considerations

Model data updates

The Model uses company data from 2022 APRs and market data from September 2022. It will need ongoing updates for the latest APR and market data.

Scenario functionality

The Model lacks scenario functionality to consider macroeconomic sensitivities, such as inflation and interest rates. This makes it unclear whether the allowance will cover company costs under various macroeconomic conditions, especially given the recent volatility in inflation and interest rates.

Cost of embedded debt averaging

The Model calculates the cost of embedded debt based on the median cost of debt across WaSCs and large WoCs. This approach appears reasonable but will need re-evaluation with updated market and APR data and macroeconomic scenario results.

Cost of embedded debt calculation

The Model calculates the cost of embedded debt by assigning equal weight to (1) company-level 'All-in cost' which is a weighted average of eligible instrument costs, and (2) 'Actual-notional' where company-level cost is assumed to be a weighted average of the company's fixed-rate interest rate and its index-linked interest rate. The latter approach appears to be inherently less relevant as a primary basis for calculating the cost of embedded debt as it does not directly reflect the costs actually incurred by the sector.

Model exclusions

The Model excludes swaps, junior debt, intercompany debt, and liquidity facilities. The treatment of these debt categories is discussed as follows:

- Swaps:

The PR24 FM only considers cross-currency swaps in the calculation of embedded debt cost. This is because while the FM recognises that interest rate swaps can be used to synthetically replicate debt instruments, their inclusion may diverge from the regulatory aim of compensating efficient debt interest costs. However, we don't agree with this conclusion given the following reasons:

- Rationale for inclusion of interest rate swaps

Interest rate swaps are integral to debt issuance as they can adeptly replicate 'pure debt' and are widely utilised in the sector. As a result, excluding them could distort all-in costs and contradict recent CMA precedent.

The FM identifies the risk management role of swaps but states that the advantages mainly benefit shareholders, not customers.

- Risk management and regulatory dynamics

Drawing a distinction between swaps and 'pure debt' for risk management purposes is deemed artificial, as both instruments serve holistic risk management objectives, particularly in light of regulatory dynamics. The omission of swaps might deter their utilisation for risk management, potentially affecting the long-term cost of debt.

- Synthetic replication of 'pure debt'

The FM acknowledges the use of swaps for the synthetic replication of 'pure debt' but overlooks instances where synthetic debt issuance has proven more efficient. The prevalent use of swaps in the sector suggests that a notional company would likely employ them, and their exclusion would result in a misalignment with the sector's economic and optimal outturns.

- Ex post changes and precedents

Excluding swaps implies a retrospective change to treasury policies, which is likely to misrepresent all-in costs for AMP8.

Additionally, the CMA included swaps in PR19 appeals highlighting the potential equivalence and utility of swaps in synthetically replicating debt instruments, especially when the required debt instruments are not readily available in the live market.

Therefore, excluding most swaps may result in a material understatement of the all-in cost of financing for a notionally efficient issuer. An appropriate starting position would be to include all swaps and make exclusions and adjustments based on the nature of specific instruments.

- Junior debt:

The FM outlines the primary reasons for excluding junior debt, focusing on its lower repayment priority, potential sub-investment grade rating, and its link to highly geared company structures. These characteristics are deemed to make junior debt less pertinent for a notional company. However, we don't agree with this conclusion given the following reasons:

- Impact on financing costs

Junior debt could potentially lead to a reduction in the overall net cost of financing. It may enhance the credit quality of senior tranches, thereby reducing the yield on these tranches and lowering the higher yield of junior tranches. Excluding junior debt might distort the representation of financing costs by only reflecting the benefits, such as lower yields on senior tranches, without accounting for the associated costs. To accurately determine the all-in cost of debt, either junior debt should be included, or the impact of its exclusion on the rating and pricing of related senior instruments should be considered.

- Consideration of counterfactual scenarios

Understanding the impact of excluding junior debt is crucial for developing a counterfactual scenario where junior debt is not issued. Demonstrating that costs in this counterfactual scenario are lower than in a scenario excluding junior debt is necessary to validate the assumption that junior debt can be omitted from sector costs, as suggested by the FM.

- Intercompany loans:

The Model provisionally excludes intercompany loans. Where intercompany loans are issued on a pari passu basis with an external issuance at a rating equivalent or higher than the OpCo's, they should be included in the calculation.

3.2. Cost of new debt

We disagree with the proposed inclusion of the benchmark index adjustment due to the lack of robust evidentiary support and the potential to create perverse incentives.

In relation to the former, we agree with the CMA that the adjustment risks *“encouraging companies to shorten the tenor of their debt, which may not be in the best interests of customers over the long-term.”*²⁹ This is because:

- to avoid being out of the money based on an upwards sloping yield curve, companies would likely issue at shorter tenors.

²⁹ [Cost of debt working paper \(publishing.service.gov.uk\)](https://publishing.service.gov.uk)

- short-term issuance creates exposure to rising interest rates and could result in companies taking on more interest rate risk than assumed for the notional company. This risk would ultimately be passed on to our customers in the form of higher bills where shorter-tenor strategies are reflected in regulatory policy (i.e. when the new, shorter, debt matures and needs to be refinanced during future price reviews).
- there is also a detrimental impact on customers due to the abandonment of asset-liability matching and a lack of support for long-term investments.

The application of the benchmark index adjustment was subject to extensive analysis and debate at CMA. The CMA's views were that "*there is insufficient evidence of like-for-like outperformance of water company debt versus the broader market*"³⁰ and that tenor was not a material driver of outperformance and did not justify any adjustment by itself³¹. The CMA removed the wedge on new debt on the basis that previous drivers (high rating, EIB debt, floating debt) would be unlikely to drive systematic outperformance going forwards³².

We note that the 15bps adjustment included in the FM is not directly based on a comparison of water company bond yields to the benchmark index. Instead it was derived as follows:

- Ofwat observed that the weighted-average maturity of the fixed GBP-denominated bonds (public, EIB and private placements) issued by water companies between 2015 – 2022 was 15.5years.
- Ofwat then inferred a term premium of 17bps for issuing at a tenor of 20Y (per the benchmark index) compared to the 15Y issuance implied by the sector's data.

The effect of this adjustment is to restate the yields on the benchmark index from c.20Y underlying maturity to 15Y, i.e. it is a term premium-based adjustment. However, we do not consider that this approach supports an application of the benchmark index adjustment.

First, this analysis should be extended to cover floating and index-linked bonds and bonds issued in currencies other than GBP. Whilst it is appropriate to exclude these instruments from a comparison of yields between water company issuances and the index (given that they are not included in the index), the same would not apply to a simple analysis of the average maturity of the sector's issuances.

Second, it is not appropriate to constrain the sample to bonds issued after 2015; instead a longer look-back window is appropriate. Whilst the more recent issuances may appear to be more informative for the potential tenor profiles at AMP8, this is not the case given the differences between the outturn macroeconomic environment from AMP6 and the expected one for AMP8. The macroeconomic environment is an important factor that companies take into account in structuring their issuances.

³⁰ CMA (2021), PR19 FD, para. 9.823

³¹ Ibid, para 9.825

³² Ibid, para. 9.824

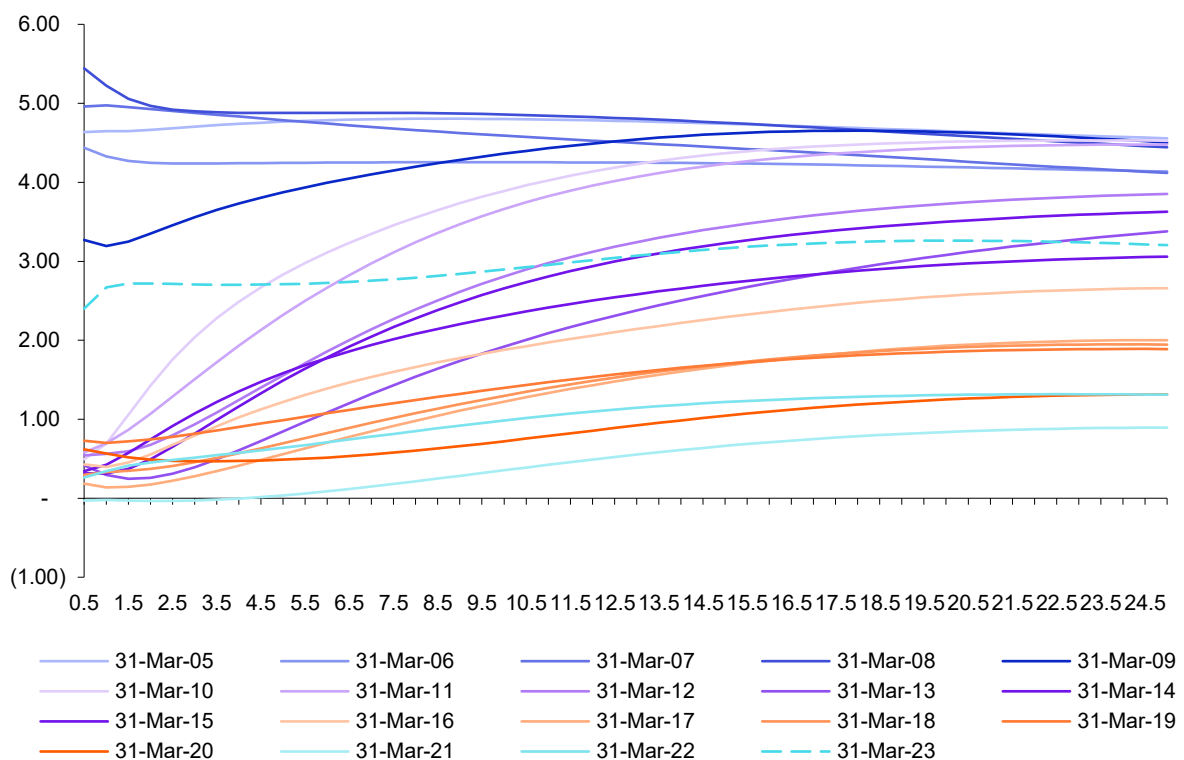
The shape of the yield curve can provide useful information on both prevailing and expected future interest rates. A 'normal' upwards sloping yield curve typically indicates that interest rates for short-term loans are lower than for long-term loans and provides a disincentive to issue long-dated debt. Whereas a flat or an 'inverted' yield curve longer makes issuing debt at longer maturities, lock in lower rates and reduce re-financing risk comparatively more attractive. A steeply upward-curving yield might lead a company to decide to issue shorter dated debt assuming that rates will have reduced by the time refinancing is required.

Figure below sets out the evolution of the yield curve based on nominal Gilts rates between 2005 – 2023. The following observations emerge based on the chart:

- During 2005 - 2009 the yield curve was either flat or inverted
- During 2010 – 2015 the curve was steeply upward-sloping
- Over 2016 – 2020 the curve remained upward-sloping but progressively flattened relative to 2010 – 2016
- During 2021 – 2023 the curve continued to flatten and is essentially flat in 2023 and is more comparable to the curve from early 2000s than the curve from 2015 – 2019.

The above suggests that the analysis used by Ofwat to inform the tenor-based benchmark index adjustment is largely based on debt issued during a period that is not representative of the macroeconomic conditions that will inform the companies' decision-making on debt tenors in AMP8.

Figure 2 Evolution of annual average yield curves



Notes: Yield curves for 2005 – 2010 are in a blue gradient, 2010 – 2015 in purple, 2016 – 2020 in orange and 2021 – 2023 in light green.

To better reflect the reality of financing decisions ahead of and during PR24, the analysis should be extended back to 2005, such that includes instruments raised during similar, flat yield curve, conditions. We find that the weighted average tenor of issuances during 2005 – 2022 is 19Y for GBP-denominated fixed bonds³³ and 24Y for all debt types and currencies. On this basis, there is no evidence that a benchmark index adjustment could be justified.

Notwithstanding this, we consider that the tenor implied by the iBoxx 10+ A/BBB index represents an appropriate benchmark for long term financing of water assets and in principle any adjustment for tenor based on company issuance would not be consistent with right incentives or the customer interest.

Furthermore, when evaluating debt issued under prevailing high-interest rate conditions, the observed spread relative to the benchmark have narrowed considerably. The figure below shows that, compared to the earlier period (2015-2021) where the majority of water sector bonds are issued at below the iBoxx A/BBB index, the more recent period indicates yield at issue close to, and in several cases above, the benchmark index.

Based on all the issuance post CMA PR19 decision (from Jan 2021 to July 2023), the cost of new debt appears to indicate a higher scope for under-performance than out-performance, even before controlling for tenor and credit ratings. All else equal this would suggest that the risk is slightly downward asymmetric.

As a result, we consider it appropriate that a key adjustment of risk on cost of new debt would be removal of the outperformance wedge assumed in the PR24 FM.

3.3. Additional costs of borrowing

Issuance and liquidity costs

Ofwat's estimate of issuance fees is based on 72 issuances over the period 1993-2017³⁴ and is therefore missing over 5 years of relevant recent data. Ofwat's estimate of liquidity costs has been derived based on a 35-45bps fee and assumed to be required for 10% of total outstanding debt in 2017. We note that the 35-45bps and 10% assumptions were "*informed by information sourced from companies and drawing on some internal Ofwat analysis.*"³⁵ We consider that an analysis is required from Ofwat to evidence that the 10bps continues to be sufficient.

Liquidity costs

Ofwat's estimate has been derived based on a 35-45bps fee and assumed to be required for 10% of total outstanding debt in 2017. It is not clear that these assumptions remain relevant and applicable for PR24.

³³ For public bonds, EIB and private placements included in the balance sheet model

³⁴ [Appendix-12-Risk-and-return-CLEAN-12.12.2017-002.pdf \(ofwat.gov.uk\)](#), section 6.4.5

³⁵ [Europe-Economics-Final-report.pdf \(ofwat.gov.uk\)](#), p. 72

Cost of carry

We also note that to the extent that floating rate debt is included in the calculation of the sector average debt costs ('all-in' cost approach referred to by Ofwat), it is also appropriate to include a matching adjustment for cost of carry.

This is because where floating rate debt is explicitly included in the assessment of actual costs, it is no longer appropriate to assume that the impact of cost of carry and floating rate debt offset one another. Inclusion of cost of carry with floating rate debt is consistent with the approach adopted by CMA at PR19³⁶ and Ofgem for RII02, where Ofgem provided an allowance of 10bps based on network financing and cash on balance sheet³⁷.

We note that Ofwat recognises that companies must certify annually that they have sufficient facilities and resources to finance their activities for the following twelve months.

As a placeholder we have adopted the same assumption as Ofgem at ED2 but note that this needs to be analysed further based on water sector data.

CPIH basis risk mitigation

In the draft methodology for PR24, Ofwat argued that based on Ofgem methodology the allowance for the notional water company would be c. 2bps on the overall cost of debt. Ofwat is only applying the adjustment to new debt. An uplift is warranted on both embedded and new debt. ILD in the sector is almost entirely RPI-linked (90% of the total index-linked debt) which creates a significant asset liability mismatch with the CPIH-linked revenues / RCV.

The decision to move from an RPI- to a CPIH-based framework is outside of company control and could not have been predicted at the time debt structures and hedging strategies were put into place. The transition should be implemented in a manner that does not penalise and disadvantage certain networks due to exogenous factors outside their control.

Assuming the same pricing as Ofgem (i.e. 15bps on embedded and 30bps on new debt)³⁸, the overall uplift should be consistent with Ofgem's.

There is a material and varying wedge between RPI and CPI as well as RPI and CPIH which creates basis risk exposure for companies. This issue is exacerbated ahead of PR24 due to the current volatility in the macroeconomic environment which is reflected in the dynamics of the wedge. Furthermore, to date companies have largely issued CPI-linked debt – given the lack of depth in the CPIH-linked market – meaning that even where companies hedge their RPI exposure, they are still exposed to basis risk between CPI and CPIH. This puts further upward pressure on the required uplift for basis risk mitigation.

As a placeholder we have adopted the same assumption as Ofgem at ED2 but note that this needs to be analysed further based on water sector data.

³⁶ CMA (2021), PR19 FD, paras. 9.607 – 9.608

³⁷ ED2 FD, Finance Annex, p. 15

³⁸ ED2 FD, Finance Annex, para. 2.42

Overall estimate of additional borrowing costs

We adopt 25bps as a holding assumption, noting that further sector specific analysis is required to (1) evidence that the 10bps allowance for issuance and liquidity costs remains appropriate and (2) derive estimates of cost of carry and basis risk mitigation costs based on water sector data.

3.4. Share of new debt

We have provisionally adopted the 17% holding assumption as per the FM but note that this will have to be revisited once there is more clarity around the scale of capital programmes for PR24. We also note the following observations:

- For transparency, Ofwat's analysis of the share of new debt should be included in the balance sheet cost of debt model and made publicly available
- The step change in the scale of capital programmes relative to PR19 to achieve compliance with environmental targets is likely to vary materially between companies. Depending on the level of variance between the expected shares of new debt across the sector and given the significant difference between CoD_E and CoD_N it may no longer be appropriate to employ a single assumption for the share of new debt. The approach to this parameter should be revisited at DD.

As a result, we have considered the 24% new debt % as a more reasonable estimate to accurately reflect the new issuance required to fund our AMP8 capital programme. We have set out the detailed quantification of our new debt % in the table below³⁹.

It is important to note that as a relatively infrequent issuer compared to other companies we have relatively lumpy debt issuance (i.e. we do not issue at benchmark size in each year). As a result, it will be important to carefully evaluate new debt requirements for AFW across PR24 to ensure that assumed new debt reflects new debt requirements for a notional company with characteristics like AFW.

Table 5 New debt % quantification

Parameter	Formula	Estimate
Closing RCV (22/23) £m	A	2,224
Opening RCV (22/23) £m	B	1,857
RCV growth for AFW (22/23) £m	$C=A-B$	367
Gearing	D	55%
Implied new debt to fund growth (22/23) £m	$E=C*D$	202
Notional refinancing of embedded debt (22/23) £m	$F=B*D*5/15$ <i>(this assumes embedded debt)</i>	340

³⁹ Parameters are extracted from AFW PR24-financial-model-v21a

Parameter	Formula	Estimate
	has an average 20-year tenor)	
Average new debt (22/23) £m	$G=(E+F)/2$	271
Average debt (22/23) £m	$H=(A+B)/2$	1,122
New debt %	$I=G/H$	24%

3.5. Alternative estimate for cost of debt

Water UK has commissioned an expert report on alternative cost of debt estimates from KPMG, set for release in November 2023. This report will address the cost of embedded and new debt issues mentioned above.

In our business plan, we've provisionally adopted Ofwat's PR24 final methodology cost of embedded and new debt estimates. Additionally, we have updated Ofwat PR24's estimate using the June 2023 cut-off to align with KPMG's CoE estimates and our new debt percentage derived above.

It's important to note that our cost of debt estimate will need to be updated in November, informed by KPMG's cost of debt expert report.

The provisional cost of debt estimate using June 2023 cut off is presented in the table below.

Table 6 Provisional cost of debt estimate

	Ofwat PR24 FM	AFW approach
CoD _E	2.34%	2.59% ⁴⁰
CoD _N	3.28%	3.82% ⁴¹
Share of new debt	17%	24%
Additional costs of borrowing	0.10%	0.25%
CoD	2.60%	3.14%

4. Retail margin deduction

Ofwat has applied a retail margin adjustment to the cost of capital for the appointee to avoid double counting compensation for systematic retail risks given that allowed returns are set at the appointee level considering risk from all controls (including retail).

As discussed in the KPMG report retail margin adjustment is not supported by empirical evidence and therefore, we agree with no need of applying the adjustment to the cost of equity.

⁴⁰ 2.59% is based on updated balance sheet model which excludes actual-notional approach.

⁴¹ Excluding 15bps outperformance wedge consistent with CMA PR19 approach.

5. Our overall WACC range

The provisional WACC estimate is presented in the table below, which is informed by KPMG CoE report and our approach to CoD based on Ofwat PR24 FM balance sheet model using a June 2023 cut off.

Table 7 Overall WACC range

	Ofwat PR24 FM	AFW
Notional gearing	55%	60%
TMR	6.46%	6.68%
RFR	0.47%	1.93%
Observed gearing	53.35%	50.09%
Unlevered beta	0.28	0.32
Debt beta	0.10	0.10
Asset beta	0.33	0.37
Notional equity beta	0.61	0.78
CoE range	3.67 – 4.60%	5.28 – 5.95%
Aiming up for estimation uncertainty	0%	0.15%
CoE range after aiming up	3.67 – 4.60%	5.43 – 6.10%
CoD _E	2.34%	2.59%
CoD _N	3.28%	3.82%
Share of new debt	17%	24%
Additional costs of borrowing	0.10%	0.25%
CoD	2.60%	3.14%
Appointee WACC	3.08 – 3.50%	4.05 – 4.32%
Retail margin deduction	0.06%	0.00%
Wholesale WACC range	3.02 – 3.44%	4.05 – 4.32%

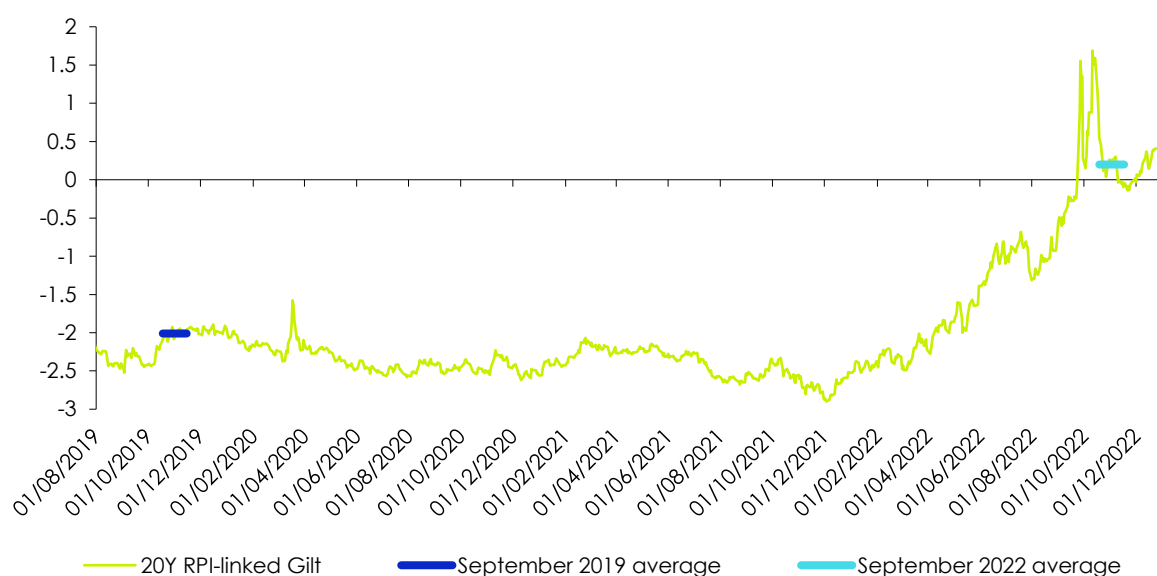
6. Annex 1- The context for setting returns at PR24

There has been a step change in the macroeconomic environment across the last couple of years, both in terms of increases in interest rates and increases in volatility and uncertainty. Regulatory methodologies for allowed returns designed during 'lower for longer' macroeconomic conditions are not suitable in this new environment and could undermine the financeability and attractiveness of the sector at a critical time for the environment and customers. Specifically:

- At 60% gearing, Ofwat's early view allowed return for PR24 (mid-point 4.50%) implies a decrease of 23bps relative to the to the CMA PR19 FD (4.73%).
- At 55% gearing, Ofwat's early view allowed return for PR24 (mid-point 4.14%) implies a decrease of 1bps relative to the to the CMA PR19 FD (4.15%) on a like for like basis.

Between September 2019 – September 2022 and June 2023 market rates have increased by c230 bps c330bps respectively, which all else equal would be expected to put material upward pressure on the WACC. In the PR24 FM increases in market rates to September 2022 have not translated into an increase in returns primarily as a result of changes in methodology for estimation of returns applied in the PR24 FM.

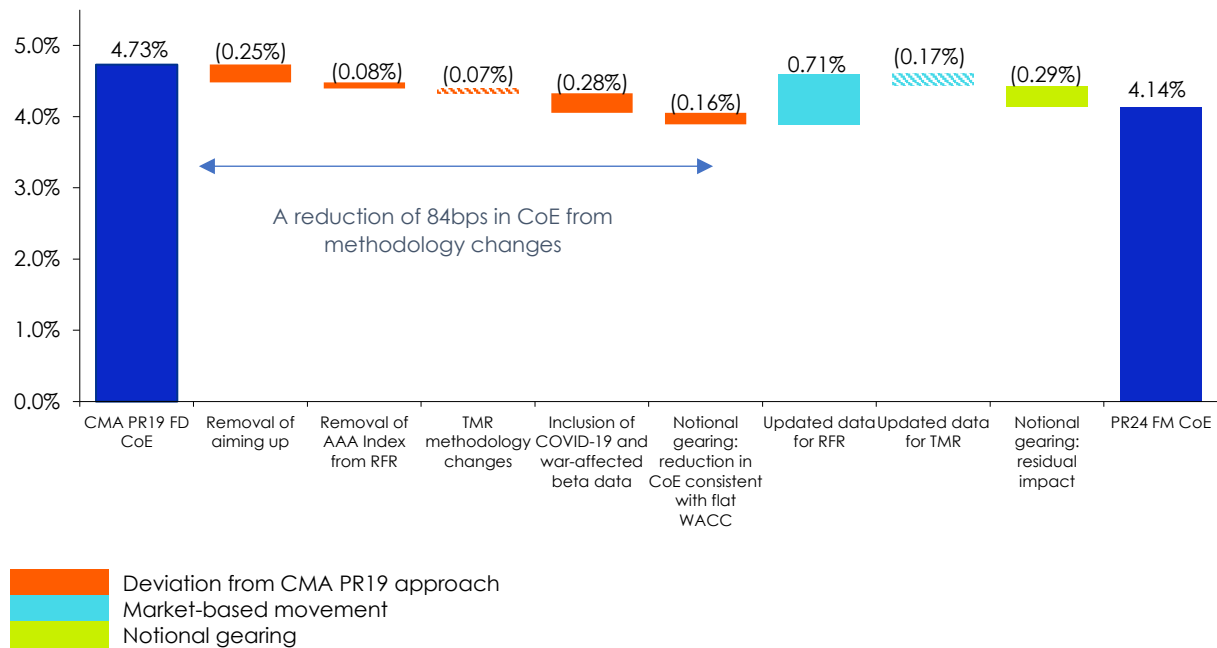
Figure 3 Evolution of the yield on 20Y RPI-linked Gilt



Ofwat's approach departs from the CMA's methodology applied at PR19 across all cost of equity (CoE) parameters. The reduction in notional gearing puts further downward pressure on the allowed CoE⁴². At 55% gearing, the PR24 FM early-view CoE (4.14%) is lower than the CMA PR19 FD (4.15%). This is counterintuitive given that rates have *increased very materially* since the CMA's decision.

⁴² There is no expectation for the weighted cost of capital to be fully invariant to gearing due to market frictions and distortions.

Figure 4 Reconciliation of CMA PR19 CoE to point estimate set out in Ofwat's Final Methodology for PR24⁴³



At face value, Ofwat's early view WACC for PR24 suggests that there is a significant reduction in the risk exposure for equity based on reduction in cost of equity on like for like basis and assumed lower betas. However, our analysis suggests that risks are likely to *increase* for the notional firm at PR24.

In consequence, we have sought to cross check whether the cost of equity implied by the final methodology is consistent with wider market evidence. The implied disconnect between (1) underlying risk exposure and returns; and (2) changes in the macroeconomic environment and returns are well-illustrated by an analysis of the relative dynamic between equity and debt pricing. These pricing differentials represent a useful cross-check to examine whether the relationship between equity and debt pricing has been appropriately reflected in the cost of equity allowance.

Based on market data and corporate finance literature, there is a clear relationship between equity and debt pricing. For example, in pecking order theory, debtholders typically earn a lower return than shareholders as the former are entitled to a higher asset claim in the event of bankruptcy.

Equity return premia should be (1) higher than debt premia (2) more sensitive to new information compared to debt premia. All else equal, this suggests that (1) for a change in one unit of risk, the marginal change in equity return would be *higher* than that of debt and (2) an increase in risk would be expected to result in a widening of the differential between equity and debt premia.

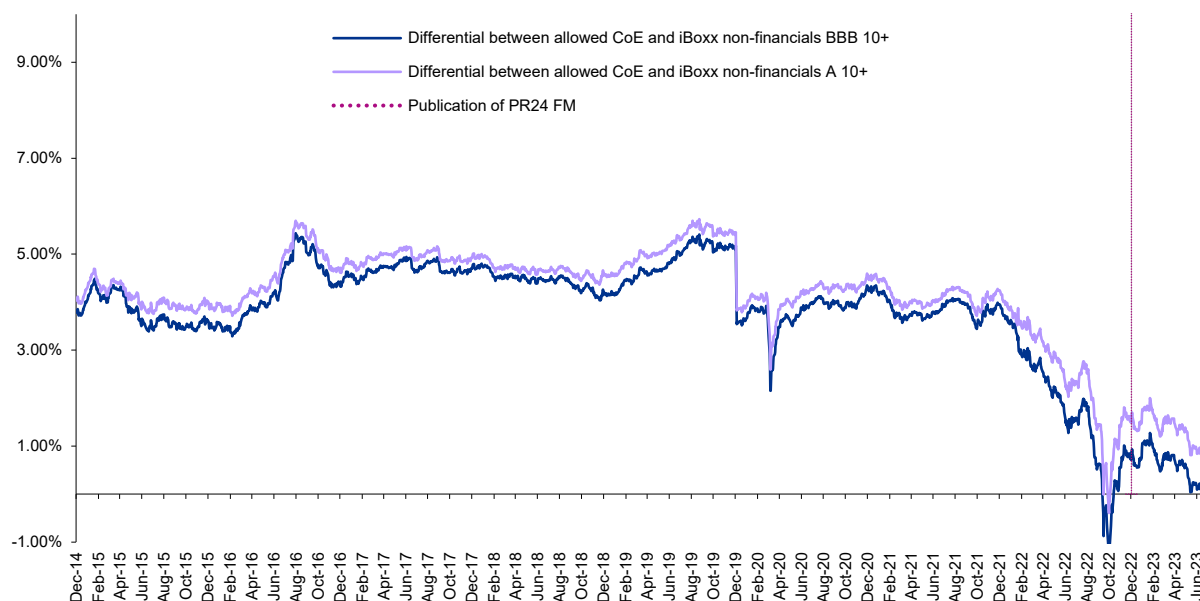
To assess what the pricing differential evidence implies for cost of equity at PR24, KPMG has looked at the observed differentials between allowed CoE and market pricing of debt and inferred CoE as a cross check based on debt pricing.

⁴³ For TMR, the split between market- and methodology- based changes is provisional and subject to further analysis.

KPMG considers how the pricing differentials have evolved over time and whether the pricing differential implied by the PR24 final methodology is consistent with previous regulatory determinations.

The figure below considers the pricing differential between IBoxx non-financial A&BBB 10+ and allowed CoE, which shows material reduction given current interest rate environment.

Figure 5 Evolution of the differential between allowed CoE and yields on the benchmark index (on a comparable 55% gearing basis)⁴⁴



One would expect the pricing differential implied by Ofwat's PR24 methodology to at least remain consistent with previous determinations in the absence of material changes in risk exposure – however, this is not the case. Additionally, in the most recent period the differential between allowed CoE and the yields on the BBB-rated has been very close to zero which effectively assumes that equity has the same risk exposure as BBB-rated debt. This does not appear to be consistent with corporate finance theory.

The fall in pricing differentials is likely driven by a combination of (1) step changes in market rates, (2) limited responsiveness of the regulatory CoE to such changes and (3) changes in methodology for estimation of the CoE in the PR24 FM.

Changes in market rates

There has been a significant increase in the return on debt expected by investors following recent market volatility. This is evidenced by a material increase in the 20Y

⁴⁴ Note: Differential calculated from ex-ante allowed CoE and outturn iBoxx. Allowed CoE is fixed over the price control based on long term inflation and taken from Ofwat (2022), PR24 Final Methodology, Appendix 11 – Allowed return on capital, Table 2.1. CMA (2021), PR19 Final Determination, Table 7. Ofwat (2019), PR19 final determinations: Allowed return on capital appendix, Table 1.1. Ofwat (2014), Setting price controls for 2015-20 Final price control determination notice: policy chapter A7 – risk and reward, Table A7.10. Ofwat (2009), Future water and sewerage charges 2010-15: final determinations, Table 46, section 5.4.4.

yield based on publicly traded debt pricing. The upward pressure on rates from high inflation is expected to ease slowly over 2023.

Following the step change in rates, pricing differentials were close to zero at the end of September 2022. All else equal, this suggests that the pricing of CoE allowance under Ofwat's assumptions is not consistent with market pricing of debt.

Limited responsiveness of the regulatory CoE

The regulatory CoE does not appear to be sufficiently responsive to changes in market rates relative to CoD. During the period of elevated volatility from December 2021 to October 2022, CoD increased by 5.03% (from 2.00% to 7.03%), materially above the RfR increase of 4.20% (from 0.29% to 4.49%).

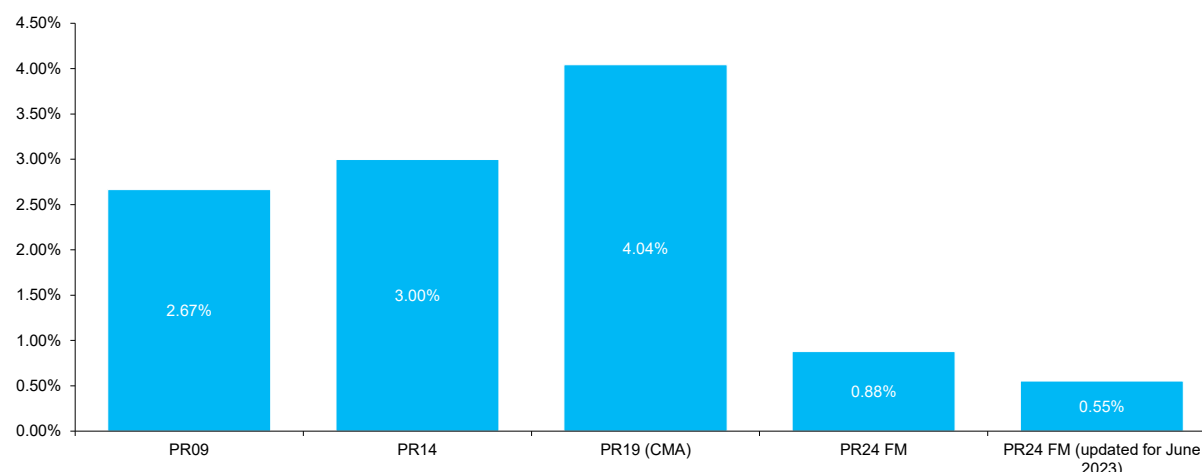
Even with RfR indexation, a change in RfR of 4.20% during the above period only results in a CoE uplift of 1.26-1.68% assuming an equity beta range of 0.6-0.7. The expected pricing differential dynamic would suggest the required change in CoE should be *higher* than the change in CoD at 5.03%.

Damodaran (2021) suggests that *"there should be a relationship across the risk premiums in these asset classes [debt and equity] that reflect their fundamental risk differences... there is enough of a relationship here that we would suggest using this approach as a secondary one to test to see whether the equity risk premiums that we are using in practice make sense, given how risky assets are being priced in other markets."* The narrowing of debt and equity pricing does not *prima facie* make sense and suggests that further analysis is required in this area. It is important to note that a key driver of the narrowing of the CoD and CoE differential appears to be the assumption of a fixed Total Market Return (TMR), alongside recent methodological changes to estimation of CoE as set out in the PR24 FM. As a result, CoE is not as responsive as debt to changes in interest rates.

Change in methodology for estimation of the CoE in the PR24 FM

Figure 6 compares the pricing differentials implied by the previous price controls and Ofwat PR24 FM methodologies, with the latter implying a significantly lower ratio. The implied rate of change for CoE is significantly lower than the corresponding change for CoD. This is partially due to changes in methodology implied by the FM and suggests that all else equal, CAPM parameters based on the final methodology for PR24 could be mis-calibrated. The differential between CoE and CoD_n has reduced significantly by c.300bps from CMA PR19. The differential reduces by a further 33bps when allowed CoE and CoD_n are updated for the June 2023 cut-off.

Figure 6 The evolution the differential between CoE and CoD_n (on a comparable 55% notional gearing basis)⁴⁵



Note: Ex-ante allowed CoE vs ex-ante allowed CoD. Allowed CoE and CoD are fixed over the price control based on long-term inflation assumptions from the respective regulatory decisions.
 Source: Ofwat (2022), PR24 Final Methodology, Appendix 11 – Allowed return on capital, Table 2.1. CMA (2021), PR19 Final Determination, Table 7. Ofwat (2014), Setting price controls for 2015-20 Final price control determination notice: policy chapter A7 – risk and reward, Table A7.10. Ofwat (2009), Future water and sewerage charges 2010-15: final determinations, Table 46, section 5.4.4.

It is also important to consider whether the pricing differential is evolving in a manner consistent with the expected evolution of the underlying risk environment. The reduction in pricing differential from 2022 in the water sector is not consistent with the expectation that pricing differential should increase when there is a step-change increase in the underlying risk environment.

The overall conclusion from this analysis is that the PR24 FM CoE does not reflect the likely macroeconomic environment and risk exposure that companies will be facing during the price control and is not consistent with corporate finance theory. In combination with the scale of methodological changes applied by Ofwat relative to the CMA PR19 FD, this finding suggests that the approach for estimating each CoE parameter merits careful re-evaluation to ensure that it is not introducing a downward bias into the estimate.

⁴⁵ The following inflation assumptions, from the respective determinations, to derive the nominal values: PR24 FM: 2.00%, PR19 (CMA): 2.00%, PR19 (FD): 2.00%, PR14: 2.80%, PR09: 2.50%.

7. Annex 2 - Initial commentary on the Balance Sheet Cost of Debt Model and implications for the cost of embedded debt



Initial commentary on the Balance Sheet Cost of Debt Model and implications for the cost of embedded debt

September 2023



1 Important notice

This Note been prepared by KPMG LLP ('KPMG', 'we' or 'our') for Water UK on the basis of the engagement contract between Water UK and KPMG (the "Engagement Contract"). Water UK commissioned the work to inform in its deliberations concerning the cost of debt (CoD) estimates included by the Water Services Regulation Authority (Ofwat) in the Final Methodology for the upcoming PR24 price control.

This Note is for the benefit of Water UK only. It has not been designed to be of benefit to anyone except Water UK. In preparing this Note we have not taken into account the interests, needs or circumstances of anyone apart from Water UK. We have prepared this Note for the benefit of Water UK alone.

This Note is not suitable to be relied on by any party wishing to acquire rights against KPMG (other than Water UK) for any purpose or in any context. Any party other than Water UK that obtains access to this Note or a copy and chooses to rely on this Note (or any part of it) does so at its own risk. To the fullest extent permitted by law, KPMG does not assume any responsibility or liability in respect of our work or this Note to any party other than Water UK.

In particular, and without limiting the general statement above, since we have prepared this Note for the benefit of Water UK alone, this Note has not been prepared for the benefit of any other person or organisation who might have an interest in the matters discussed in this Note, including for example water companies or regulatory bodies.

Information in this Note is based upon publicly available information and reflects prevailing conditions as of the date of the Note, all of which are accordingly subject to change. Although we endeavour to provide accurate and timely information, there can be no guarantee that such information is accurate as of the date it is received or that it will continue to be accurate in the future. Information sources and source limitations are set out in the Note. We have satisfied ourselves, where possible, that the information presented in this Note is consistent with the information sources used, but we have not sought to establish the reliability or accuracy of the information sources by reference to other evidence. We relied upon and assumed without independent verification, the accuracy and completeness of information available from public and third-party sources. KPMG does not accept any responsibility for the underlying data used in this report.

The findings expressed in this Note are (subject to the foregoing) those of KPMG and do not necessarily align with those of Water UK.

This engagement is not an assurance engagement conducted in accordance with any generally accepted assurance standards and consequently no assurance opinion is expressed.

This Note should not be copied, referred to or disclosed, in whole or in part, without our prior written consent, except as specifically permitted in the Engagement Contract.

2 Context and scope

Ofwat in the PR24 Final Methodology ('FM') has set a single allowance for the cost of embedded debt primarily based on projected actual debt costs for WaSCs and large WoCs over AMP8. This is, in principle, in line with the CMA's PR19 Final Determination ('FD'). Ofwat has published a Balance Sheet Cost of Debt Model ('Model') which outlines how it has calculated projected actual debt costs for the sector over AMP8, supplemented by commentary in the FM.

Water UK has commissioned KPMG to develop an estimate for the cost of embedded debt based on company business plans, latest market data and 2023 APRs. The analysis will be submitted to Ofwat in November.

This Note sets out initial commentary on the methodology applied in the Model and implications for the cost of embedded debt, ahead of the submission of the analysis. It covers (1) refinancing; (2) amortisation and accretion; (3) modelling of debt balances; (4) model functionality and methodological considerations; (5) inclusion criteria; and (6) initial analysis of the potential impact of updating the Model for latest market data.

3 Refinancing

- a) The Model does not include debt required to finance projected RCV growth between 31 March 2022 and the end of AMP7. Additional debt issuance required to finance RCV growth over the remainder of AMP7 should be captured. For context, at the sector level around £1.5bn in additional debt needs to be raised to finance RCV growth at 60% notional gearing over the remainder of AMP7¹. As the cost of new debt is at present higher than the cost of embedded debt, inclusion of additional debt in AMP7 could increase the cost of embedded debt. For illustration, iBoxx A/BBB 10+ yields were 5.89% over June 2023 which compares to 2.31% over the first two years of AMP7.
- b) The Model refinances fixed and index linked debt maturing in AMP7² at Ofwat's cost of new debt assumption for AMP8³. This is based on a 1m trailing average of iBoxx A/BBB 10+ yields less a 15bps benchmark index adjustment. However, the CMA determined for AMP7 that there was insufficient evidence to apply an outperformance adjustment⁴. Moreover, debt issuance in the sector for the remainder of AMP7 may not in practice support application of an outperformance adjustment. Careful analysis of recent debt issuances in the sector is warranted to assess whether there is robust evidence to support an outperformance adjustment. Removing the 15bps outperformance adjustment would increase the cost of embedded debt.
- c) The Model refinances floating rate debt maturing in AMP7 at an all-in rate comprised of the floating rate benchmark as at September 2022 and the margin on the existing instrument. However, it may be more appropriate for the margin used for refinancing to reflect the latest market conditions and be applied on a sector-wide basis in line with the approach used for fixed rate and index linked debt⁵.
- d) The Model does not refinance fixed and index linked debt maturing on the last day of AMP7 (i.e. 31 March 2025). Refinancing debt maturing on this day at Ofwat's cost of new debt assumption has a relatively significant impact on the cost of embedded debt⁶.

¹ Based on projected nominal RCV values as at 31 March 2022 and 31 March 2025 from the PR19 FD models

² In this Note 'debt maturing in AMP7' refers to debt maturing between 31 March 2022 and the end of AMP7

³ Fixed and index linked instruments that are assigned a refinancing case of 1 in column AZ of <Mastertab> mature in AMP7 and are refinanced at Ofwat's cost of new debt assumption

⁴ CMA (2021), PR19 FD, para. 90

⁵ The formula in column CH of <Mastertab> refinances floating rate debt maturing in AMP7 and AMP8 at an all-in rate comprised of the floating rate benchmark as at September 2022 and the margin on the existing instrument. The floating rate benchmark used for the refinancing is the same as that for the existing instrument i.e. existing debt linked to 6m SONIA is refinanced with new debt linked to 6m SONIA. However, it may be more appropriate for all floating rate debt in the sector to be refinanced with reference to a single floating benchmark plus a single, sector-wide margin

⁶ The formula in column AZ of <Mastertab> should assign a refinancing case of 1 to fixed and index linked instruments with years to maturity of exactly 3 years. Amending the formula in column AZ for this (while holding all else equal) increases the cost of embedded debt by 5bps from 2.34% to 2.39% in CPIH real terms

- e) Ofwat provides separate allowances for embedded debt and new debt raised over AMP8. However, the Model refinances embedded debt maturing in AMP8 with new debt and includes the cost of this new debt in the cost of embedded debt. In particular, the Model refinances embedded fixed and index linked debt maturing in AMP8 at Ofwat's cost of new debt assumption⁷, and floating rate debt at the all-in rate noted above. As a result, the Model partially double-counts the cost of new debt raised over AMP8 in the cost of embedded debt. Removing the double-count is likely to reduce the cost of embedded debt.
- f) Relatedly, given the scale of refinancing and the capital programme in AMP8, Ofwat will need to carefully evaluate the share and cost of new debt for AMP8.
- g) The Model excludes swaps and intercompany debt⁸. The Model implements this by excluding the cost of existing swaps/intercompany debt and any refinancings⁹. This implicitly assumes that swaps/intercompany debt will be refinanced with the same category of debt. This may not necessarily be the case in practice and consequently it may not be appropriate to exclude swap/intercompany debt refinancings as a starting point. For example, Ofgem at ED2 "*excluded intercompany loans from embedded debt costs but assumed they are refinanced at their maturity with 20-year fixed rate debt raised at the forecast benchmark rate for that year*"¹⁰. Including these swap/intercompany debt refinancings could increase the cost of embedded debt.

4 Amortisation and accretion

- a) The Model adjusts principal balances as at 31 March 2022 for amortisation and accretion until the end of AMP7¹¹. However, it does not adjust for amortisation and accretion over AMP8. As a result, interest costs projected for AMP8 may be misstated.
- b) The Model assumes that all amortising debt in the sector is amortised on a straight-line basis from issuance. In particular, the Model calculates an average annual amortisation rate from issuance to 31 March 2022, and applies the same rate to the remainder of AMP7¹². However, most amortising debt has an initial period of no amortisation and is then amortised straight-line until maturity (particularly EIB debt which is widely present across the sector). As a result, the current approach to modelling amortisation risks under-statement of amortisation.
- c) The Model includes a check to assess whether amortisation is calculated accurately. Specifically, the check identifies cases of over-amortisation i.e. where the amortisation adjustment results in a negative principal balance for an instrument, the check forces a zero balance¹³. However the check does not identify cases of under-amortisation i.e. where an instrument in practice matures, it may have a non-zero balance in the Model due to under-amortisation. Given that the Model checks for over- but not under-amortisation, this could amplify the risk of under-amortisation.
- d) The Model assumes for index linked debt that principal balances as at 31 March 2022 are linked to March 2022 inflation index values¹⁴. However, in practice, principal balances are likely to be linked to index values from several months earlier. For example, in March 2022, an instrument may be linked to the July 2022 index value (8 month lag). Older issuances of index linked debt in the sector typically have a lag of 8-10 months whereas more recent issuances tend to have shorter lags. These lags should be taken into account in the modelling of accretion for AMP7 and (when included) AMP8.

⁷ Fixed and index linked instruments that are assigned a refinancing case of 2 in column AZ of <Mastertab> mature in AMP8 and are refinanced at Ofwat's cost of new debt assumption

⁸ The formula in column CM of <Mastertab> excludes swaps and intercompany debt (as well as other categories of debt)

⁹ Includes (1) refinancing intercompany debt and balance sheet accretion on index linked swaps with new debt; and (2) replacing swaps with new debt

¹⁰ Ofgem (2022), RIIO-ED2 DD – Finance Annex, para. 2.59

¹¹ Using 'Step 4 - Amortisation adjustment' and 'Step 5 - Accretion adjustment' in <Mastertab>

¹² The formula in column BM of <Mastertab> calculates an average annual amortisation rate from issuance to 31 March 2022. The formula in column BN then applies this same rate to the remainder of AMP7

¹³ The formula in column BR of <Mastertab> checks for over-amortisation and the formula in column BS forces a zero balance where there is over-amortisation

¹⁴ The formulas in cells F14-15 of <Inputs> imply that principal balances as at 31 March 2022 are linked to March 2022 inflation index values

- e) The Model refinances debt maturing in AMP7 at the interest rates noted above. However, for debt maturing in AMP7 that is amortising, the balance is in many cases amortised to a value close to zero at maturity in AMP7 and is not then refinanced before AMP8 i.e. the balance stays close to zero over AMP8¹⁵. In consequence, the interest rates assumed for refinancing are paired with balances which are close to zero.

5 Modelling of debt balances

- a) The calculation of the cost of embedded debt should incorporate interest costs and debt balances that are (1) on a consistent basis; and (2) capture all relevant adjustments such as issue discounts/premia (and wrapping fees). In relation to (1), the Model calculates interest costs using an effective interest rate approach¹⁶, but uses principal outstanding balances as the relevant debt balance¹⁷ which is not consistent with an effective interest rate approach. In relation to (2), the effective interest rate approach used to calculate interest costs appropriately reflects any issue discounts/premia, but the principal outstanding balances used as the relevant debt balance do not¹⁸. These issues could result in misstatement of the cost of embedded debt.
- b) The Model seeks to directly estimate an average cost of embedded debt over AMP8, instead of modelling debt balances and interest costs on an annual basis over AMP8 and then calculating an average cost of embedded debt. The approach adopted in the Model reduces the transparency of projected costs and limits scope to sense check results.
- c) The Model effectively calculates interest costs in each financial year by multiplying interest rates with debt balances at the financial year end position¹⁹. This means that all instruments are assigned an interest cost of zero in their financial year of maturity²⁰. This only holds where an instrument matures at the beginning of the financial year, however this is unlikely to be the case in practice and so a majority of instruments will incur interest costs in their financial year of maturity. It follows that, by disregarding each instrument's actual maturity date, the Model may be distorting the cost of embedded debt.

6 Model functionality and methodological considerations

- a) The Model has been populated with company data from 2022 APRs and market data from September 2022. The Model will need to be updated on an ongoing basis for the latest APR and market data. The potential impact of using market data until June 2023 is discussed in 8(a)-(c).
- b) The Model has not been set up with scenario functionality to consider the impact of different macroeconomic sensitivities. As such, the FM does not include sensitivities for inflation and interest rates. In consequence, it is not clear whether the allowance will reasonably cover company costs under a range of plausible macroeconomic conditions. This is particularly important for AMP8 since inflation and interest rates have generally been on upwards trajectory in the recent past and remain volatile. For context, iBoxx A/BBB 10+ yields increased by over 2.5x between the first two years of AMP7 (2.31%) and June 2023 (5.89%). Ofgem at ED2 stress tested its cost of debt allowance under a range of macroeconomic and totex scenarios²¹.
- c) The cost of embedded debt is based on the median cost of debt across WaSCs and large WoCs. To inform the selection of the averaging measure, the FM considers the distribution of the cost of

¹⁵ This can be observed in columns BT-BV of <Mastertab> after filtering both column BG by 'TRUE' and column BH by '1.00'

¹⁶ The formulas in columns AJ-AL of <Mastertab> calculate effective interest rates which are then used to derive the interest costs in column AP. This is only applied for fixed and index linked debt. For floating rate debt, the coupon as reported in the APR is used as the relevant interest rate. This may be reasonable as there are only a few floating rate instruments not issued at par and hence in the majority of cases, the effective interest rate is equal to the coupon (where wrapping fees are omitted)

¹⁷ The formula in column F of <Company benchmarking> calculates the cost of debt as interest cost / principal outstanding

¹⁸ Principal outstanding balances are based on an issue price of 100

¹⁹ This is not immediately apparent from the Model because it does not model debt balances and interest costs on an annual basis as noted in 5(b). However this treatment is implied by the formula in, for example, column AP of <Mastertab> which calculates interest costs by multiplying effective interest rates with principle outstanding balances as at 31 March 22

²⁰ This is not immediately apparent from the Model because it does not have separate rows for an existing instrument and its refinancing. This can be seen from the formula in, for example, column BB of <Mastertab> which for fixed and index linked debt maturing in AMP8, calculates a weighted average interest rate for AMP8 across the existing instrument and its refinancing

²¹ Ofgem (2022), RIIO-ED2 FD – Finance Annex, para. 2.84

debt among the sampled companies. This approach appears reasonable and will need to be re-evaluated taking into account updated market and APR data as well as the results of macroeconomic scenarios.

- d) The cost of embedded debt is calculated by assigning equal weight to (1) 'All-in' cost which is a weighted average interest rate across a company's instruments; and (2) 'Actual-notional' cost which is a weighted average of a company's interest rates for fixed rate and index linked debt²². The CMA at PR19 triangulated its allowance in part on the basis that the approaches it considered – i.e. 'All-in', 'Actual-notional' and one based on fixed and index linked debt costs only – implied consistent estimates for the cost of embedded debt. The 'All-in' approach appears to be inherently most relevant as a primary basis for calculating the cost of embedded debt as it directly reflects the costs actually incurred by the sector.

7 Inclusion criteria

- a) The Model currently excludes swaps, junior debt, intercompany debt and liquidity facilities²³. The treatment of these categories of debt is discussed below.

7.1 Treatment of swaps

- a) The Model currently excludes all swaps apart from cross-currency swaps. The key rationale set out in the FM²⁴ for this treatment is considered below.
- b) The FM recognises that interest rate swaps can be used to synthetically replicate debt instruments (e.g. index linked debt), but notes that this is not the sole function for which these instruments have been used. The FM considers that other functions of interest rate swaps (e.g. risk management) are not intrinsic to debt financing and therefore including them would (1) venture beyond the regulatory objective of remunerating efficient debt interest costs; and (2) make the cost of debt allowance less relevant for the notional company.
- c) Interest rate swaps should be included because (1) risk management is inherent to any debt issuance and so swaps cannot be distinguished from 'pure debt' on this basis; (2) where swaps are used to synthetically replicate 'pure debt', they may be more efficient than direct issuance; (3) swaps are used extensively by the sector and so a notional company based on sector dynamics would be expected to use them; (4) the exclusion of swaps would imply an ex post change to treasury policies which is likely to misstate all-in costs; and (5) this position is supported by recent CMA precedent. These reasons are covered in turn below.
- d) Distinguishing between swaps and 'pure debt' as risk management tools: The FM recognises that swaps may be used for risk management. However, it considers that the benefit of swaps used for risk management accrue in the first instance to shareholders and not customers, and thus such swaps should not be included.
- e) Assuming that only swaps are used for risk management introduces an artificial distinction between these instruments and 'pure debt'. Risk management is inherent to 'pure debt' issuance as well as swaps. Issuance of 'pure debt' involves adopting a risk management position in relation to, *inter alia*, tenor, currency, debt type. Different options would imply varying degrees of exposure to interest rate, currency, inflation, and wider cost of debt performance risk in the context of prevailing and expected future market conditions and regulatory policy. Companies implement risk management policies using a combination of swaps and 'pure debt' to achieve holistic risk management objectives.

²² Weights of 67% : 33% are applied to interest rates for fixed rate debt : index linked debt respectively. This is in line with the debt mix for the notional company set out in the FM

²³ It also excludes debenture stock because these typically have equity-like characteristics, and preference shares because these are hybrid instruments which may be more debt or equity-like. Ofwat notes that it may potentially include preference shares at DD/FD, specifically, it will consider evidence that these instruments are more 'debt-like' on a case-by-case basis

²⁴ Ofwat (2022), PR24 FM, Appendix 11 – Allowed return on capital, p. 62

- f) Swaps can be a useful tool for facilitating management of risk exposures implied by the dynamics of the regulatory regime. For example:
- Index linked swaps can be used to manage inflation risk including the asset liability mismatch and the real nominal mismatch in cashflows (the difference between returns set on a real basis and nominal debt costs).
 - The full transition to CPIH at AMP8 and the nascent nature of the market for direct CPI/CPIH-linked issuance are both fully outside company control. To this end, basis swaps can be used to manage the risk of mismatch between CPIH-linked assets and RPI-linked debt.
- g) Exclusion of swaps from the cost of embedded debt could disincentivise companies from using these instruments to facilitate risk management. This could potentially result in a suboptimal toolkit available for risk management, which in turn could adversely impact on the cost of debt funded by customers over the long term.
- h) The use and impact of swaps for synthetic replication of 'pure debt': The FM recognises that synthetic replication of direct issuance is a valid function of swaps. However, it does not acknowledge that issuing synthetic debt has been more efficient than issuing equivalent 'pure debt' at different times in the past. For example, companies' current portfolios include index linked swaps that were entered into during times of illiquidity in the index linked bond/debt market, such as during the global financial crisis.
- i) Consistency between actual and notional company use of swaps: A cost of debt policy based on sector costs implicitly assumes that it represents a good benchmark for the efficient cost incurred by the notional company. Swaps are extensively used in the sector by companies with different financing strategies and policies and so are an integral part of the sector's financing. All else equal, this suggests that a notional company based on sector costs would be expected to use swaps. Exclusion of swaps would imply that notional company financing would not match the economic reality of financing observed across the sector.
- j) Potential impact from ex post changes to the sector's treasury policies: Exclusion of swaps from company debt portfolios would imply a retrospective change to treasury policies. This is because it implicitly assumes that if, in a counterfactual scenario, a company had not entered into swaps, it would have issued the same 'pure debt' as in the factual scenario without reconsidering its approach to 'pure debt' issuance in light of its risk management objectives. Whilst the counterfactual cannot be known with certainty, the assumption that companies would have issued 'pure debt' on an unchanged basis in combination with an exclusion of corresponding swaps is likely to misstate all-in costs for AMP8.
- k) Implications of CMA precedent: The FM considers that the analysis carried out by the CMA as part of its PR19 re-determinations which reflected companies' post-swap cost of debt does not represent a valid reason to include swaps. The FM suggests that the CMA's approach may have been out of necessity – as the only available up-to-date information source at the time was expressed on a post-swap basis – and does not indicate that the CMA would consider that these instruments warrant inclusion in sector costs where pre-swap data is available. This does not appear to be consistent with the CMA's recent position on cost of debt, which recognises that swaps may warrant inclusion in sector costs. For example:
- In addition to basing its cost of debt allowance on the post-swap position, during the PR19 re-determination the CMA commented that "*the companies may reasonably expect that if issuing straight debt plus a swap instrument were economically equivalent but more flexible than issuing index-linked debt (at any particular moment) these two approaches should be treated equivalently in any assessment of actual costs*"²⁵.
 - In the RII0-2 FD, the CMA noted that "*in theory, it may be useful to count some derivative instruments when calculating an average actual cost of debt for a regulated sector. The most useful derivative instruments to count would seem to be those that are used to synthetically replicate debt instruments, such as index-linked debt – particularly when such approaches*

²⁵ CMA (2021), Water Redeterminations 2020, Cost of Debt – Working Paper, para. 176

are used when useful debt instruments such as index-linked debt are not readily available in the size or tenor required”²⁶.

- l) It is possible for swaps to be used for other functions aside from synthetically replicating direct issuance and risk management. These other functions could potentially result in a distortion of embedded debt costs for AMP8 due to reprofiling of financing costs over time. It may be appropriate to exclude or make adjustments for such swaps. However, it does not appear appropriate to exclude almost all swaps as in the FM.
- m) Overall, the exclusion of all swaps could result in a material under-statement of the all-in cost of debt for an efficient notional company. An appropriate starting position for the calculation of the cost of embedded debt based on sector costs would be to include all swaps and make exclusions and adjustments where these are warranted based on the nature of specific instruments.

7.2 Treatment of junior debt

- a) The key rationale in the FM for excluding junior debt is (1) its low-ranking repayment priority which could result in a sub-investment grade rating; and (2) its association with companies with highly-g geared structures. The FM considers that these features make junior debt less relevant for a notionally-structured company.
- b) Junior debt may have resulted in an overall reduction in the net cost of financing. Specifically, junior debt may have supported the enhanced credit quality of senior tranches, which in turn would have lowered the yield on these senior tranches and offset the higher yield attached to junior tranches. The exclusion of junior debt could present a misleading picture of financing costs by reflecting the benefits of junior debt – i.e. in form of senior tranches issued at lower yields – whilst excluding corresponding costs. To accurately capture the all-in cost of debt, either:
 - Junior debt should be included; or
 - The impact of excluding junior debt on the rating and pricing of other structurally related but more senior instruments would need to be understood. This could be used to inform the specification of a counterfactual scenario where junior debt was not issued. It is necessary to demonstrate that costs in the counterfactual scenario would have been lower than costs in a scenario which excludes junior debt to support the assumption that junior debt can be excluded from sector costs as implied by the FM.
- c) The calculation of the cost of embedded debt based on sector costs is agnostic to companies’ actual gearing levels. The exclusion of junior debt on the grounds of its association with companies with highly-g geared structures implies that different weight should be attached to instruments based on the structures of issuing companies.

7.3 Treatment of intercompany loans

- a) The Model provisionally excludes intercompany loans to ensure that projected sector costs do not include costs associated with shareholder loans, as these instruments could have equity-like characteristics. Ofwat has signalled its intention to undertake further engagement to understand the nature and purpose of intercompany lending.
- b) Where intercompany loans have been issued on a *pari passu* basis with an external issuance at a rating equivalent to or higher than the OpCo’s, these instruments would be no different from those directly issued by the notional company and should be included in the calculation.
- c) The FM notes that the inclusion of intercompany debt has negligible impact on the cost of embedded debt based on 2022 APR data. The sensitivity of the cost of embedded debt to the inclusion of intercompany debt will need to be analysed based on 2023 APR data and under different macroeconomic scenarios.

²⁶ CMA (2021), RIIO-2 FD, Volume 3: Individual grounds, para. 14.250

7.4 Treatment of liquidity facilities

- a) The Model excludes costs associated with liquidity facilities, overdrafts, and RCFs as these are accounted for in the allowance for issuance and liquidity costs. This approach is appropriate where such facilities are used entirely for day-to-day liquidity management as is the case with the majority of facilities in the sector.
- b) However, there appear to be several facilities which are at least in part used for RCV financing. The component of these facilities used for RCV financing should in principle be included in the calculation of the cost of embedded debt to accurately capture the cost of RCV financing across the sector. It follows from this that the inclusion of such facilities would need to be considered on a case-by-case basis.

8 Initial analysis of the potential impact of updating for latest market data

- a) At this stage the Model has been updated for market data available as at June 2023 but not 2023 APRs. No changes have been made to the calculation methodology.
- b) The Model has three categories of inputs that would require updates to reflect the latest market data: (1) refinancing assumption for fixed and index linked debt; (2) inflation assumptions used for accretion up to the end of AMP7; and (3) calculation of the floating rate adjustment. These inputs have been updated in the following manner:
 - The refinancing assumption in cell C7 of <Inputs> has been updated based on the average yield over June 2023 on iBoxx A/BBB non-financials 10+ index less a 15bps benchmark index adjustment. These rates were sourced from Refinitiv Datastream.
 - The RPI and CPI values in cells C14-E15 of <Inputs> that feed into the calculation of compound inflation used for accretion on index linked instruments until the end of AMP7 have been updated based on March 2023 forecasts from the Office of Budget Responsibility.
 - The floating rate adjustment calculation in column CG of <Mastertab> has been updated based on base rate and SONIA rates from June 2023. These rates were sourced from Refinitiv Datastream.
- c) Updating each of these inputs to reflect a cut-off of June 2023 (and continued use of APR 2022 debt inputs) results in an increase in the cost of embedded debt from 2.34% to 2.50% in CPIH real terms. This is based on assigning equal weight to 'All-in' and 'Actual-notional' costs, however the cost of embedded debt based solely on the 'All-in' cost would be 2.59% in CPIH real terms.

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