

SRN64 Cost of Capital Technical Annex

2nd October 2023
Version 1.0



from
**Southern
Water** 

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1. Executive summary

The risk landscape at PR24 is substantially changing compared to previous price reviews. There is a significant and unprecedented step up in our capital programme expected for AMP8 and beyond, driven by environmental obligations including on the use of storm overflows, abstraction reduction, Net Zero and resilience. The calibration of PR24 incentive package also adds to the risk, as the PR24 Ofwat Final Methodology (FM) proposes to substantially reduce the scope of risk protecting features on ODIs such as deadbands, caps and collars, while the application of the price control deliverables will also reduce the scope for outperformance on totex.

At the same time as the step-change in the enhancement programme and re-calibration of the incentive package, there has been a significant shift in the macroeconomic landscape, marked by rising interest rates, high inflation, and heightened volatility. Regulatory methodologies for allowed returns that were developed during ‘lower for longer’ macroeconomic conditions may no longer be appropriate in the current environment.

The overall scale and complexity of our proposed enhancement programme for AMP8 is significantly greater than in previous price controls. Our estimated capex spend for AMP8 totals £3,295m (2017/18 prices) or £4,007 (2022/23 prices), an increase of 285% compared to an allowance for AMP7 and of 100% compared to an allowance for AMP6. Table 1 shows the overall scale of capital investment proposed in AMP8 compared to allowances in prior regulatory periods as a percentage of the opening RCV. Such a step-up in investment increases our exposure to supply chain and labour market risks, which carry systematic components as they are influenced by the common macroeconomic parameters.

Table 1: Comparison of capital investment expected in AMP8 with allowances in AMP7 and AMP6

| Capital investment allowed (proposed for AMP8) | AMP6 | AMP7 | AMP8 |
|--|-------|------|-------|
| Total, £m (2017/18 prices) | 1,640 | 855 | 3,295 |
| Total, % of opening RCV (real) | 35% | 17% | 60% |

Source: Southern Water analysis.

To fund and deliver this programme, significant capital is required, including substantial new equity, to enable us to maintain our target gearing throughout AMP8, and we need to ensure we can attract the capital we require.

Similarly, the notional company also requires new equity to deliver its increasing enhancement programme, given the increasing capital intensity. To sustain its gearing at 55%, the notional company needs to fund 45% of its capex with equity, and its operating cash flows alone would not suffice due to the sheer scale of capex well exceeding RCV depreciation.

In this environment it is critical for the notional company to be able to earn a risk-adjusted return sufficient to attract new equity. The investment universe is competitive, and there are substantial demands for capital in adjacent sectors, including energy through Net Zero. Additionally, investment grade debt became more attractive as an asset class since the interest rates have increased and competes for the capital that could otherwise be allocated to the regulated water sector’s equity. For example, the nominal yield on the GBP non-financials BBB iBoxx index is currently 6.6% – in this context the equity premium on offer in the PR24 FM could be considered unappealing.

In the most recent period, the differential between PR24 FM implied Cost of Equity (CoE) and the yields on the BBB-rated iBoxx has been very close to zero which does not recognise the additional risks that equity

faces due to its subordinated nature. As discussed in the KPMG report¹, application of the inference analysis to the pricing differential between the equity and debt indicates that the CoE as set out in PR24 FM could be materially mis-calibrated which may result in equity investment in the UK water sector being deemed less attractive than other available opportunities with better risk-reward profiles.

In addition to the challenges in attracting new equity capital posed by the increase in the interest rates, a rise in risks specific to UK water sector also weakens the case for new equity. Our notional company risk analysis in the corresponding technical annex² shows that absent any risk mitigations, the notional company faces risk exposure in RoRE terms of -9.94%(P10) to +2.56%(P90), with mean expected risk to return (P50) of -3.59%. The application of risk mitigations we propose, including return adjustment mechanisms, results in a narrower risk range for the notional company, with less downside asymmetry: -5.56%(P10)/+4.24%(P90) and (P50) of -0.84%. However, this remains wider than the illustrative ranges presented in the PR24 FM, with the notional company still unable to earn allowed equity return on a median expected basis and warrants a cost of equity adjustment to reflect the downside asymmetry.

Our view on appropriate Southern Water WACC in PR24 incorporates the changes to the overall risk environment that the notional company is expected to face and adopts a methodological approach consistent with the CMA ruling in PR19, supported by the rigorous analysis of the recent market evidence. Table 2 summarises our overall view of the appropriate Southern Water WACC, where a point estimate of 4.58% (CPIH-real) is considered most appropriate, corresponding to the notional gearing of 60%.

Table 2: Summary of key parameters in an appropriate WACC at PR24

| Parameter (CPIH) | Commentary | June 2023 data 55% notional gearing | June 2023 data 60% notional gearing |
|---------------------------|--|-------------------------------------|-------------------------------------|
| Notional gearing | Notional gearing in line with the estimate at PR19 is considered to remain appropriate. A new estimate of 55% is not supported by robust market evidence or corporate finance principles. | 55% | 60% |
| Total market return (TMR) | Analysis undertaken by KPMG ³ identifies a range for TMR of 6.33-6.96%, which falls within the CMA's PR19 range. The mid-point of this range of 6.68% is adopted as the point estimate. | 6.68% | |
| Risk-free rate (RFR) | Consistent with the approach taken by the CMA at PR19, an appropriate estimate of RFR should capture an adjustment for convenience yield and the yield on AAA-rate corporate bonds. Reflecting the recent market data, KPMG calculated this as 1.93%. | 1.93% | |
| Unlevered beta | Updated estimate factors in appropriate adjustments, including the increase in systematic risk in AMP8, impact of changes introduced at PR19, and 'flight-to-safety' effect in the observable data, with the resulting unlevered beta range of 0.31-0.33. We believe an appropriate point estimate to be 0.33 to reflect the scale and complexity of our capital programme as it increases our exposure to undiversifiable, systematic risk and is supportive of beta estimate at the top of the observed range. | 0.33 | |
| Debt beta | This is consistent with the PR24 final methodology | 0.10 | |
| Observed gearing | Observed gearing based upon KPMG analysis | 49.38% | |
| Equity beta | Derived by leveraging the asset beta | 0.72 | 0.80 |
| CoE (pre aiming up) | Derived in accordance with CAPM | 5.35% | 5.72% |

¹ KPMG: Inference analysis as a cross-check on allowed returns at PR24, September 2023.

² Annex: Risk to allowed returns in AMP8.

³ KPMG: Estimating the Cost of Equity for PR24, August 2023.

| | | | |
|-------------------------------------|--|-------|-------|
| Aiming up for parameter uncertainty | KPMG analysis considers that an adjustment of 15bps – in line with the CMA’s decision at PR19 – is the minimum required to avoid disincentivising levels of investment required for AMP8 and beyond in the context of parameter uncertainty. | 0.15% | |
| Aiming up for asymmetry | The CAPM assumes that returns are normally distributed, i.e. they are clustered around the mean with a symmetric distribution. The notional company’s returns, even after applying a range of mitigations, are clustered around the mean of allowed cost of equity less 0.84%, and so the notional company does not have a fair chance of earning the allowed return on a risk-adjusted basis. Consequently, we propose a 0.84% uplift to cost of equity to ensure investment in the notional company constitutes a ‘fair bet’. | 0.84% | |
| CoE (post aiming-up) | - | 6.34% | 6.71% |
| Cost of embedded debt | The cost of embedded requires further analysis, which is currently being undertaken by KPMG. This estimate is based on the Ofwat balance sheet model updated to reflect movements in iBoxx A/BBB up to September 2023 | 2.59% | |
| Cost of new debt | This reflects June 2023 iBoxx A/BBB data and does not include an outperformance wedge as application of the wedge is not supported by the most recent market data. In fact, investor pricing of the expected risk could result in an inverse halo effect. | 3.89% | |
| Proportion of new debt | This is based on new debt issuance required under a notional structure to fund our PR24 capital programme and corresponding RCV growth | 25% | |
| Additional borrowing costs | We have assumed a 25bps allowance to account for cost of carry and part of the RPI/CPIH basis risk | 0.25% | |
| CoD | - | 3.17% | |
| Retail margin adjustment | There are conceptual and methodological reasons why the RMA may not be warranted. After adjustment specific quantitative factors, the implied RMA reduces to 0-1bps, a level at which we consider a nil adjustment most appropriate | - | |
| SW WACC (Wholesale) | - | 4.60% | 4.58% |

Source: Southern Water analysis.

2. Our View of an Appropriate WACC and its key Parameters

Although we have complied with the PR24 FM cost of capital approach, updated for the recent market movements, in our main business plan and the data tables⁴, and therefore used it for our financeability and financial resilience assessment, our view of an appropriate WACC differs to the one proposed by Ofwat.

We believe that WACC parameters should be set in such a way that reflects recent industry precedents including the CMA ruling at PR19, increased systematic risk and ensures market inputs are consistent with the assumptions underpinning the CAPM. We set out appropriate parameters and approach below.

⁴ See appendix.

Cost of equity: beta

Estimates of beta should capture underlying systematic risk over the forward-looking investment horizon consistent with that used to estimate other CAPM parameters. For PR24 there are events that require bespoke treatment in the estimation of a beta consistent with this principle:

- First, increases in systematic risk associated with the step up in capital intensity imply that additional comparators are needed to capture forward-looking risk dynamics for PR24 and beyond.
- Second, as recognised by Ofwat, the change in the regulatory regime at PR19 materially affected water sector betas, rendering earlier data less reflective of BAU fundamental risk.
- Third, there has been a material reduction in water company betas since the inception of the Covid19 pandemic and the Russia-Ukraine war, which appears to be a function of the ‘flight to safety’ phenomenon whereby in times of market turbulence investors respond by switching their holdings away from higher risk investments into investments which are perceived to be low risk. These behavioural factors are temporary by nature and are not driven by fundamentals.

Analysis undertaken by KPMG⁵ suggest a beta range of 0.31-0.33, when appropriate adjustments for these factors are implemented. For us specifically, an appropriate point estimate is closer to the upper end of the range, 0.33, reflecting our increased exposure to non-diversifiable, systematic risks due to the scale and complexity of our capital programme.

Cost of equity: total market return (TMR)

TMR is generally considered to be a relatively stable parameter, implying that regulatory estimates developed in close succession should be relatively consistent. Analysis undertaken by KPMG⁶ identifies a range for TMR of 6.33-6.96%, which falls within the CMA’s PR19 range. An appropriate estimate of TMR is the mid-point of this range, 6.68%. Table 3 sets out the key methodological issues identified by KPMG in respect of ex ante estimates of TMR, which are the primary drivers accounting for the difference versus the TMR range in the PR24 FM.

Table 3: KPMG analysis of ex ante TMR estimates

| Category | Methodological issues | Cum. change in point estimate relative to FM |
|---|--|--|
| Use of international data | Ofwat has relied on world data in several approaches without, for example, taking into account that different legal systems of constituent countries affect return expectations. Estimates based on international data are not included in the Report. | 7bps |
| Application of serial correlation adjustments | The application of serial correlation adjustments is inconsistent with the principles laid out in the literature upon which these methodologies are built and risk introducing distortions in the estimates or invalidating the models being used. Investors would not assume serial correlation is present in their <i>expected</i> return. Serial correlation adjustments are not included in the Report | 28bps |
| Assumption of dividend growth repeatability | Ofwat imputes the degree of repeatability of real dividend growth based on statements in the DMS Yearbook, the derivation and justification of which are unclear. Applying the same approach to 2023 data results in an unreasonable expectation of <i>negative</i> real dividend growth. These estimates are disregarded in the Report. | 30bps |

⁵ KPMG: Estimating the Cost of Equity for PR24, August 2023.

⁶ bid

| | | |
|-------------------------|---|-------|
| Use of flawed data sets | The Barclays Equity and Gilt study is not reliable and contains well publicised issues. A constructed data set based on academic research has been substituted in its place for estimation of ex ante TMR using the Fama-French DGM approach. | 39bps |
|-------------------------|---|-------|

Cost of equity: risk-free rate (RFR)

Consistent with the approach taken by the CMA at PR19, an appropriate estimate of RFR should capture an adjustment for convenience yield and the yield on AAA-rate corporate bonds. After adjusting for these factors, KPMG assessed a point-estimate for RFR of 1.93% (CPIH-real). Table 4 sets out an extract showing the outline of the approach taken by KPMG in reaching their estimate.

Table 4: Extract from KPMG outline of approach to RFR estimate

| Component of RFR | Outline of approach | Point estimate |
|--|--|--------------------|
| Starting point: ILG yields | <p>1m trailing average of 20Y RPI index-linked gilts (ILGs), converted into CPIH terms using Ofwat's RPI-CPIH wedge of 0.54%.</p> <p>Given that Ofwat sets a real cost of capital, it is a more direct approach to rely on real estimators of the risk-free rate like ILG yields.</p> <p>20Y tenor is in line with the investment horizon for the sector and 1m average reflects that interest rates remain volatile. If this volatility persists, companies will need to consider how to capture this in the CoE e.g. through indexation. Ofwat's RPI-CPIH wedge will need to be updated as the 2030 UKSA RPI reform draws closer.</p> | 1.48% CPIH-real |
| Lower bound adjustment to ILG yields: CY(ILG) | <p>Gilts and other government bonds provide additional benefits for investors (such as their superior collateral value vs other safe assets) which push their yield below the risk-free rate. The difference is the convenience yield (CY).</p> <p>Academic literature estimates that CY for 2Y nominal gilts (NGs) is 38bps and Ofwat uses this to derive an estimate of CY(ILG) for 2Y ILG of 7bps. There are weaknesses in Ofwat's analysis which once resolved imply that CY(ILG) for 2Y ILG is 11bps and could be higher at longer tenors (based on academic literature for CY(NG) and cross-checks for CY(ILG)).</p> <p>The Report adopts a point estimate for CY(ILG) at the midpoint of 11bps and 38bps which recognises that (1) the determinants of CY referenced in academic literature apply similarly for NGs/ILGs but NGs may be more liquid; and (2) the 11bps and 38bps will be higher under current market conditions based on recent data and academic literature.</p> | 24.5bps |
| Upper bound adjustment to ILG yields: AAA-ILG difference | <p>Where investors' borrowing rate is higher than their saving rate (as is the case in practice), the appropriate risk-free rate for the CAPM lies between the two rates, per Brennan (1971).</p> <p>The risk-free saving rate is the ILG yield + CY(ILG) of 24.5bps i.e. the lower bound above.</p> <p>The risk-free borrowing rate used in this Report is the AAA corporate borrowing rate (but this is an underestimate of the true investor borrowing rate). Thus the upper bound adjustment to ILGs is the difference in yield between AAA corporate bonds and ILGs.</p> <p>The AAA-ILG difference implied by approaches based on CMA PR19 FD, CAA H7 FD and RPI AAA bonds is 41-75bps. A point estimate of 66bps is selected based on RPI AAA bonds as this is the most direct approach for deriving the AAA-ILG difference.</p> | 66bps |
| Overall estimate of RFR | <p>Brennan (1971) does not specify where in the range the appropriate risk-free rate for the CAPM should lie. The Report adopts a point estimate for the adjustment to ILG yields just below midpoint of 24.5bps and 66bps (45bps).</p> <p>Combining the ILG yield of 1.48% CPIH-real with the 45bps adjustment implies an overall estimate for the risk-free rate of 1.93% CPIH-real.</p> | 1.93% CPIH-real |

Source: Southern Water analysis.

Cost of equity: aiming up

There is inherent uncertainty in estimating the unobservable CoE and greater potential harm from underestimation of returns compared to overestimation. As a result, there is merit in setting the point estimate for the allowed CoE of essential service providers above the mid-point.

The CMA recognised the validity of this rationale when it aimed up on the PR19 CoE to maximise consumer welfare in the context of estimation uncertainty. The CMA's decision indicates that its concerns around incentives for investment and customer welfare would be particularly acute where investment changes. KPMG analysis considers that an adjustment of 15bps – in line with the CMA's decision at PR19 – is the minimum required to avoid disincentivising levels of investment required for AMP8 and beyond in the context of parameter uncertainty. We have adopted this adjustment.

Further, the CAPM assumes that returns are normally distributed, i.e. they are clustered around the mean with a symmetric distribution. As a result, the CAPM does not inherently account for asymmetric downside risk that may be present in a regulatory incentive package. As set out in the Executive Summary, even after risk mitigations, the notional company is exposed to a significant downside risk on returns, reflected in a P50 RoRE of -0.84%. Therefore, a 0.84% uplift to cost of equity is required to ensure that the notional company can earn the allowed return on a mean-expected basis.

Notional gearing

Notional gearing of 60% in line with the estimate at PR19 remains appropriate while an estimate of 55% proposed in PR24 FM is not supported by robust market evidence or corporate finance principles:

- All companies in the sector have gearing which is higher than 55%, with average gearing significantly higher: 68.2% as at 31 March 2023.
- Assuming a lower notional gearing cannot improve the notional company's overall financial position if business risk has increased – assuming lower gearing in practice reallocates risk from debt to equity. This is particularly relevant given the requirement for new equity to fund enhancements in AMP8.

Retail margin adjustment (RMA)

The PR24 FM includes an RMA to avoid double counting compensation for systematic retail risks. Whilst the remuneration for retail risks is provided separately using a margin approach, the appointee beta (and hence the appointee CoE) implicitly reflect retail and wholesale risks, resulting in a double count of remuneration.

There are conceptual and methodological reasons why the RMA may not be warranted, including that the adjustment may imply spurious accuracy given the inherent imprecision in beta estimation, and that the notional company may not in fact earn any net return on retail. Analysis of RoRE data for AMP7 to-date suggests the industry average retail return is -0.6%, based on the RoRE reported in the APRs.

Further, KPMG analysis identifies two specific quantitative factors in relation to the PR24 FM:

- The inclusion of creditor balances in the annual working capital requirement is not appropriate as these are offset by wholesale debtors at the consolidated appointee level.
- The utilisation of a 3.06% working capital financing rate assumption from 2018 in the RMA calculation may be inappropriate due to (1) variation in working capital rates among different companies, indicating potential divergences in the basis of derivation, and (2) misalignment between the cut-off dates for cost of financing fixed assets and working capital financing rates.

After adjustment for these factors, the implied RMA reduces to 0-1bps, a level at which we consider a nil adjustment most appropriate.

Cost of debt

The cost of new debt should reflect updated market data for average A/BBB iBoxx indices and only include an outperformance wedge if this is support by current market evidence. The most recent market evidence does not support the outperformance wedge. Moreover, pricing in of the expected PR24 risk by debt investors could result in an inverse halo effect.

The cost of embedded debt requires further analysis, which is currently being undertaken by KPMG. Key areas of focus will include the assumption around the ratio of embedded to new debt, the treatment of derivatives and the allowance for additional borrowing costs.

Derivatives are an important treasury risk management tool and their exclusion from the balance sheet approach to embedded debt may result in a reduction in the cost of debt. All the swaps that are used for the treasury risk management should be included in the cost of debt allowance. In our view of an appropriate cost of embedded debt, we used up-to-date sector information, which resulted in a slightly higher estimate than that provided in the PR24 FM, 2.59% versus 2.34%, CPIH real.

An appropriate allowance for additional borrowing costs may be higher than 10bps in the PR24 final methodology to take account of cost of carry and some of the RPI/CPIH basis risk. In the RIIO-2 final determinations (FD), Ofgem set an allowance of 25bps. We have assumed a 25bps allowance in respect of additional borrowing costs, similar to the RIIO-2 FD, but note that in practice that may not be sufficient to fully mitigate the basis risk.

For our view on an appropriate Southern Water cost of capital, we have used 75:25 as the ratio of embedded to new debt considering the scale of our enhancement programme and corresponding RCV growth. Overall, we expect our RCV to grow by around 42% in real terms in AMP8. Of that growth, 60% or 55% would be funded by new debt, according to the notional capital structure. At the same time, the notional company would refinance around a third of its existing debt in AMP8, assuming average debt tenor of 15 years. A combination of these factors results in the notional company's new debt requirement of approximately 25% on average in AMP8 (i.e. (18% new + 33% refinancing) of the existing debt, or 25% on average).

Table 5 summarises our view on an appropriate cost of capital. This results in a cost of equity of 6.34-6.71%, a cost of debt of 3.17%, and a wholesale Southern Water WACC of 4.58-4.60%, all in CPIH-real terms. A point estimate of 4.58% is most appropriate, corresponding to notional gearing of 60%.

It is critical for the notional company to be able to earn a risk-adjusted return sufficient to attract new equity. A wholesale Southern Water WACC of 4.58% would appropriately remunerate investors for the risk they are taking and support equity financeability at a time when sector requires new equity capital.

Table 5: Our view of an appropriate Southern Water cost of capital – summary

| Parameter (CPIH) | June 2023 data, 55% notional gearing | June 2023 data, 60% notional gearing |
|--|--------------------------------------|--------------------------------------|
| Notional gearing | 55% | 60% |
| CoE (pre aiming up) | 5.35% | 5.72% |
| Aiming up for parameter uncertainty | | 0.15% |
| Aiming up for asymmetry | | 0.84% |
| CoE | 6.34% | 6.71% |
| Cost of embedded debt | | 2.59% |
| Cost of new debt | | 3.89% |
| % new debt | | 25% |
| Additional borrowing costs | | 0.25% |
| CoD | | 3.17% |
| Retail margin adjustment | | - |
| Southern Water WACC (Wholesale) | 4.60% | 4.58% |

Appendix

In our business plan, we used the Ofwat cost of capital methodology as set out in the PR24 FM, but updated for the latest market movements, specifically for index-linked Gilt and iBoxx yields as of June 2023. We also selected a point-estimate for TMR and unlevered beta at the upper end of the range presented in PR24 FM to account for the risk associated with the scale of our enhancement programme. The assumption for proportion of new debt is based on new debt issuance required under a notional structure to fund our PR24 capital programme and corresponding RCV growth. This gives an estimate of 3.77% (CPIH-real) at appointee level as shown in **Error! Reference source not found.6**.

Table 6: Key parameters for the Ofwat cost of capital used in our data table and business plan narrative

| Parameter (CPIH) | Ofwat PR24 methodology, June 2023 data cut-off |
|-------------------------------|--|
| Notional gearing | 55% |
| Total market return | 6.92% |
| Risk-free rate | 1.48% |
| Unlevered beta | 0.29 |
| Debt beta | 0.05 |
| Observed gearing | 51.4% |
| Equity beta | 0.64 |
| CoE | 4.96% |
| Cost of embedded debt | 2.50% |
| Cost of new debt | 3.67% |
| % new debt | 25% |
| Additional borrowing costs | 0.1% |
| CoD | 2.89% |
| Retail margin adjustment | 0.06% |
| Ofwat WACC (Wholesale) | 3.77% |